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Globalization and Competitive Strategies in European Vulnerable Regions

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Abstract

The paper highlights the role played by structural economic features and by industrial competitive strategies in the performance of a group of European regions, defined as 'vulnerable' because of their specialisation in industries particularly exposed to international trade.

Different growth patterns emerge among them. The most successful regions are those with a strong presence of high value added functions, of best-performing vulnerable sectors, but also with high structural funds expenditure on human resources. Moreover, among the industrial strategies analysed, it is found that the only winning strategy explaining higher productivity gains is industrial reconversion at the expense of employment growth.

Key words: globalization, European vulnerable regions, regional growth

JEL: R10, R11

1. Globalization and Industrial Competitive Strategies

Globalization processes have increased their scope and magnitude over the last ten years. Emerging economies have placed the competitiveness of the European economy under severe strain; and the way in which the advantages and disadvantages of greater economic and market integration are distributed is not homogeneous over space.

Regional economies, in fact, differ in terms of their “vulnerability” to international trade integration. The most vulnerable regions are those that are specialised in industries particularly exposed to international trade. Within this group of regions we expect to find completely different growth patterns, reflecting the different pro-active and re-active strategies that regions can put in place as well as the way in which they are inserted in global value chains (HUMPREY and SCHMIDZ, 2002).

Although manufacturing industries are threatened by changes in trade patterns and multinational location decisions, they can still find favourable contexts for subsistence and development in advanced and EU countries provided that they renew their industrial and territorial strategies.¹ A recent OECD Report shows how the supposed de-industrialization process is often only the result of industrial restructuring and productivity increase more than being the effect of trade challenges: ten of the eleven top manufacturing countries in the world are developed countries, and five belong to EU-15 (Germany, France, UK, Italy and Spain) (OECD, 2007).

Regions – conceived as collective agents implicitly or explicitly defining specific development trajectories – compete in the global economy by building on their historical strengths and identifying opportunities for diversification and enlargement of their specialisations by strengthening their know-how and knowledge base (CAMAGNI, 2001, 2002). Regional

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3 comparative advantage vis-à-vis external competition is therefore made dependent, among other
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5 things, on three, non-mutually exclusive, industrial competitive strategies, namely:
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10 1 - increasing productivity in the same sectors of specialization. This can be achieved by
11 means of new technologies, organizational and managerial innovation, or, in some cases,
12 corporate adaptation, especially vertical (with suppliers and customers - ABRAHAM K. G.
13 and TAYLOR S. K. (1996)) and horizontal (with similar firms in order to achieve
14 economies of scale) integration. This strategy protects and supports employment growth,
15 and for this reason we label it a strategy of '*raising productivity through innovation in the*
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2 - reconversion of regions to higher phases of the production process, i.e. in a world where
production is increasingly disintegrated (FEENSTRA, 1998; FONTAGNÉ and LORENZI,
2005 ; BALDWIN, 2006), decentralizing the low-level production phases to areas with
lower wages and production costs. This strategy preserves the regional specialization
(especially in terms of value added), generally at the expenses of job losses. Most times this
is a cost-cutting strategy, but it might also involve functional change within the sector, for
example through product development. In the impossibility to distinguish empirically the two
cases, we label this a strategy of '*cutting costs by changing to higher value segments*';

3 - reconversion of the regional sectoral structure from low value added sectors to high value
added ones, leaving the production of the sectors most affected by competition to the
competitors newly arrived from other countries. This can take place either at the expense of
job losses (*cutting costs by changing sectors*) or by increasing jobs (*raising productivity by*
moving to higher value added sectors), the final objective being to find the best position in
the territorial division of labour (DUNFORD, 2003).

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3 If none of the three strategies is implemented, regions can remain competitive only by adopting
4 very traditional strategies to limit production costs through either wage or employment decreases,
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8 the latter achieved by means of firm closures.
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12 Our aim in this paper is to highlight the economic performance of a particular group of regions
13 identified on the basis of their specialisation in an industry which records openness to international
14 competition above the European average,² and the role that the above-mentioned industrial
15 competitive strategies can play in the growth patterns of European regions. In particular, we intend
16 to measure the degree of success of industrial competitive strategies for vulnerable regions, which
17 are defined here as those regions specialised in sectors that are particularly open to global trade. In
18 terms of sectoral decomposition, we are interested only in manufacturing industries, which have
19 been historically affected firstly and mostly by globalisation processes. The empirical exercise is
20 useful for drawing some policy lessons on successful regional strategies.
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34 The structure of the paper is as follows. Section 2 describes the growth patterns of vulnerable
35 regions from 1995 to 2005, while section 3 presents the structural features associated with the
36 different growth patterns. Section 4 highlights the most important success factors of vulnerable
37 regions, among which measurement is made of the role of renewed industrial competitive strategies.
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48 2. Growth Patterns of European Vulnerable Regions

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53 Figure 1 represents the European vulnerable regions at Nuts 2 level obtained from the analysis
54 explained in Appendix 1.
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[INSERT FIGURE 1 HERE]

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Vulnerable regions are not necessarily weak regions. They are characterized by specialization in sectors particularly exposed to globalization; but this does not imply that they perform badly as a consequence of this specialization. On the contrary, some vulnerable regions are among the strongest European regions in terms of growth and/or value added per capita. For this reason, it is interesting to highlight the performance of vulnerable regions, and in particular the consequences that the three strategies entail for the performance of those regions.

Starting from the idea that productivity increases can take place within different structural processes which affect the general performance of the regional economies in rather different ways (CUADRADO et al., 2000; GARDINER et al., 2004; KAMARIANAKIS and LE GALLO, 2003) (CAMAGNI (1991) has suggested a statistical methodology with which to highlight whether productivity gains are the outcome of the growth of new and efficient firms, reconversion processes, the restructuring of existing production through process innovation, or the dropping out of non-efficient productions. In particular, CAMAGNI suggests a method to analyze two indicators simultaneously on a chart: relative employment growth, and relative productivity growth, calculated with the following formulas:³

$$\left(\frac{Pr od_r^{2005}}{Pr od_r^{1995}} \right)^{1/10} - \left(\frac{Pr od_{EU}^{2005}}{Pr od_{EU}^{1995}} \right)^{1/10} \quad (1)$$

$$\left(\frac{Emp_r^{2005}}{Emp_r^{1995}} \right)^{1/10} - \left(\frac{Emp_{EU}^{2005}}{Emp_{EU}^{1995}} \right)^{1/10} \quad (2)$$

An interesting feature of this methodology is that, when these two indicators are plotted on two axes, a 45° negatively sloped line passing through the origin approximates a condition of regional product growth equal to the national average. In fact, a region may develop at the same rate as the national GDP either if both productivity and employment grow at the same rate as the national

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3 average or if productivity increases at a lower rate but employment does so at a proportionally
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5 higher-than-average rate, and vice versa.
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10 Six possible *patterns of regional growth* emerging from the chart may be described as follows (Fig.
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12 2):
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15 1. *virtuous cycle*, when higher-than-average productivity growth generates good performance
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17 in both employment and output;
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20 2. *restructuring*, when higher-than-average productivity growth is achieved through drastic
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22 employment cuts, leading nevertheless to good output performance;
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- 24
25 3. *dropping out*, when productivity growth is achieved by closing down inefficient production
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27 units, generating lower-than-average production growth;
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30 4. *de-industrialization*, defined as a vicious cycle in which employment cuts are unable to
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32 restore competitiveness, a condition that perpetuates job losses and low output growth;
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- 34
35 5. *industrial conservatism*, when poor productivity growth is accompanied (and sometimes
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37 explained) by better-than-average employment growth; this strategy is more likely to take
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39 place in the presence of public assistance and industrial rescues;
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- 41
42 6. *economic take-off*, when lower-than-average productivity performance occurs together with
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44 very good employment performance, so that the effect on total value added is positive; this
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46 strategy is sometimes accompanied by explicit or implicit assistance policies which spur the
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48 initial development of the areas.
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[INSERT FIGURE 2 HERE]

We have applied the six patterns of growth methodology as described above to the vulnerable regions of Figure 1, calculating equations (1) and (2) with Eurostat data on regional (NUTS2) industry employment and industry value added over the period 1995-2005. The results (for 102 vulnerable regions) are plotted in Figure 2, where each region is placed in the position determined by its relative employment growth (horizontal axis) and its relative productivity growth (vertical axis).

Interestingly, there are vulnerable regions in each of the six patterns. However, only two of the six patterns can be considered positive for the regions. In fact, whilst de-industrialization is the worst situation, also the cases of dropping out and of industrial conservatism are negative: in the former case, an apparently good productivity performance is the result of the simple elimination of production units, with no or few positive counterparts; in the latter case, the good employment situation does not derive from endogenous regional development but rather from exogenous (somewhat artificial) intervention policies unlikely to induce a virtuous cycle in the medium and long run.

Often, the same artificial growth conditions apply to the case of economic take-off: the regions in this pattern achieve above-average performances in terms of employment and GDP growth, but this situation can change quite rapidly because it comes about in spite of productivity losses, so that it is hard to maintain in the absence of public assistance.

Consequently, the two patterns that are to be considered positive are the virtuous cycle and the restructuring one. The three reaction strategies are therefore successful if they are able to put vulnerable regions in these two quadrants.

The six patterns of growth are not enough to identify a correspondence between regions and their strategies. In fact, the six patterns lack indications on how the employment and productivity performances are actually achieved; in particular, whether or not they are achieved by modifying the regional sectoral structure. Calculated for the 97 out of 102 vulnerable regions for which data were available, sectoral reconversion has been measured using the so-called Lawrence index:

$${}^{1995-2002}SRC_r = \frac{1}{2} \sum_j \left| \frac{{}^{2002}VA_j^r}{{}^{2002}VA^r} - \frac{{}^{1995}VA_j^r}{{}^{1995}VA^r} \right| \quad (3)$$

where r is the region, j are the manufacturing sectors at 1-digit level and the pre-multiplication by $1/2$ is necessary in order to ensure that the range of this measure is from 0 to 1.

Note that a high value on the Lawrence index may conceal at least the three following different behaviours: the first is the change of specialization due to classic reallocation from one sector to another; the second is a crisis concentrated in some sectors which heavily decreases their total value added so that their share decreases and the shares of the others increase as a consequence, despite little or no increase in total value added; the third is a boom concentrated in some sectors, which consequently increase their shares to the detriment of the shares of the other sectors, which however do not diminish in absolute terms.

Figure 2 sets out the results of the Lawrence index for each region by means of different symbols: squares if the region has modified its sectoral structure more than the average; triangles if the region has modified its sectoral structure less than the average.

The four possible alternatives suggested by the “sectoral change” indicator plotted in Figure 2 with the help of squares and triangles are not direct measures of industrial strategies, but in the absence

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3 of pervasive policies or statistical errors, they capture quite well the outcomes of industrial
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5 strategies. For this reason, Figure 2 can help us to identify which industrial strategy can be linked to
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7 each pattern of growth of vulnerable regions.
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12 The first strategy – increasing productivity in the same sectors – is represented by triangle regions
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14 in the virtuous cycle quadrant (case 1 in Figure 2). There is only one region belonging to this
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16 category, namely Közép-Dunántúl in Hungary; this result can signal that this strategy is difficult to
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18 implement.
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24 In a global competitive arena increasingly characterized by trading tasks (GROSSMAN and
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26 ROSSI-HANSBERG, 2008), the second strategy – i.e. reconversion of the regions to higher phases
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28 of the production process – involves job losses in the lower phases due for example to the
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30 externalization of these phases to countries with lower labour costs (case 2 in Figure 2).⁴ Also
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32 thanks to the externalization of low-skilled jobs and phases, however, domestic firms in the same
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34 sectors are able to thrive, and hence to increase their domestic productivity and value added.
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36 Moreover, they are normally able to increase the number of jobs in the higher phases and
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38 qualifications.
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44 This strategy usually leads to a total employment loss, since the increase of jobs in the highest
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46 qualifications is smaller than the loss of jobs in the lowest ones. In far less common cases in which
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48 this strategy leads to employment increases, this situation is statistically indistinguishable from that
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50 of regions following the first strategy, and marked with triangles in quadrant I. Our distinction is
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52 made acceptable by the fact that, conceptually speaking, cases in which reconversion to higher
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54 phases of the production process increases employment at the same time are rare.
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58 As expected, the strategy of reconversion to higher phases of the production process is most widely
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60 used in Western European regions, but also in some Eastern ones. Note that the strategy adopted by
the – unsuccessful – triangle regions in the dropping-out quadrant is not very different from strategy

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3 2. However, triangle regions in the dropping-out quadrant adopt an externalization strategy with
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5 less success, so that domestic productivity increases but the job gains in higher phases are not
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7 enough, and total value added performance is relatively bad.
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12 The third strategy – reconversion of the regional sectoral structure – extends across the two
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14 quadrants of virtuous cycle and restructuring. In fact, any restructuring involves a loss of jobs in the
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16 obsolete sectors; and the increase of jobs in the new, more productive, sectors may be insufficient to
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18 compensate for this loss.⁵
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23 If the job gains in new sectors more than off-set the job losses in the lower phases, we have the case
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25 of squares in the virtuous cycle quadrants (case 3a in Figure 2). For these regions, the reconversion
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27 has been particularly successful and a large number of jobs in the new sectors have been created.
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29 Interestingly, these regions are mainly in Eastern Europe, with the addition of the two Irish ones
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31 and two Finnish ones⁶.
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37 When the jobs created in the new and more productive sectors are not enough to compensate for the
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39 loss of jobs in the old sectors, the sectoral restructuring strategy involves a relatively high increase
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41 of GDP and value added, but a relatively low performance in employment (case 3b in Figure 2).
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43 This is the case of squares regions in Figure 1, which are mainly Eastern European ones, but also
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45 some regions of Central European countries.
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51 The regions pertaining to the six patterns, as well as the sectoral reallocation of vulnerable regions,
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53 are depicted in Figure 3, where it is evident that the various patterns characterize different areas of
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55 Europe. The virtuous-cycle pattern is exhibited by a small number of Eastern European regions and
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57 by two recently dynamic Western countries, namely Finland and Ireland. The restructuring pattern
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59 frequently occurs; but it is spatially concentrated, mainly in regions of central Europe, as well as in
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3 the Balkans and on the Baltic. The dropping out pattern is characteristic of many regions of
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5 Germany, plus a few others in the East. The de-industrialization pattern is typical of French, Italian
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7 and Belgian regions, some of which are strong regions which should be able to replace
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9 manufacturing with services. The industrial-conservatism pattern is typical of the Italian Adriatic
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11 coast, where the industrial district model (GIULIANI E., et al., 2005) may not be able to cope with
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13 the challenges of globalization without public support, plus the North of Portugal and Dél-Dunántúl
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15 in Hungary. Finally, the economic take-off pattern is most frequent in regions assisted with
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17 structural funds and located in Spain, Italy and Greece. It also includes the sparsely populated, and
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19 hence Objective 1, Finnish region of Pohjois-Suomi.
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32 **[INSERT FIGURE 3 HERE]**
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43 Also shown in Figure 3 are the strategies adopted by the vulnerable regions falling within the two
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45 winning quadrants. As already mentioned, only one vulnerable region falls within the virtuous-
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47 cycle quadrant without sectoral restructuring (strategy 1), whereas all the others in this quadrant are
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49 able to achieve this by means of a successful sectoral reconversion strategy (strategy 3a). Most
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51 successful vulnerable regions are in the restructuring quadrant. They have adopted a strategy of
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53 either reconversion to higher phases of the production process (strategy 2) or of reconversion to
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55 higher value added sectors (strategy 3b). It is interesting that Strategy 2, reconversion to higher
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57 phases, with externalization of lower phases to other regions, is the one predominant in Western
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59 countries: Germany, Austria, Sweden and Greece, plus Slovenia. In Eastern countries, by contrast,
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3 more common is strategy 3b of reconverting the sectoral structure from old low-value added sectors
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5 to new sectors with higher value added (BURDA et al., 1993; BALDWIN et al., 1997).
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10 11 12 3. The Structural Features and Industrial Growth Patterns of European Vulnerable Regions 13 14

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17 Observing the six different patterns of the European vulnerable regions is not yet enough to draw
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19 any economic consequences relevant to policy. By characterizing these six groups of regions, on the
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21 contrary, it will already be possible to say, inductively, something about the factors which enable
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23 the regions to pursue one of the three strategies successfully. The multivariate analysis of the causal
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25 relationships between the regional characteristics and economic performance will be left for
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27 Section 4. Presented now is a descriptive analysis which identifies the characteristics which fit the
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29 patterns.
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36 We analyzed a broad set of characteristics, which horizontally pervade all sectors and are not
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38 confined to economic aspects but comprises social and settlement ones as well. Each quadrant in
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40 Figure 4 contains the list of structural features found to be statistically different between the group
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42 of regions belonging to that quadrant and all other vulnerable regions.
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3 Note that the characteristics presented in Figure 4 are not part of the definition of the six patterns of
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5 growth; they are simply the regional features that characterize the European vulnerable regions
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7 falling within each quadrant. The empirical associations of characteristics with patterns, however,
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9 will turn out to be reasonable.
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15 Vulnerable regions associated with a virtuous cycle of development are characterized by the
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17 following features: the presence of high value added functions (large shares of corporate managers);
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19 the best performing vulnerable sectors, in particular the marked growth of the electric and
20
21 electronics sector; and high expenditure of structural funds on social integration and human
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23 resources. Moreover, these regions act as the donors of growth, more than its receivers: in fact, they
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25 grow less if they are located near to growing regions.
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31 A large share of science and technology and low expenditure on structural funds characterize
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33 regions exhibiting restructuring processes. Job losses are high, probably also caused by low
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35 structural funds expenditure, while innovation helps increase industrial productivity, which records
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37 a higher-than-average value added growth. The situation in which job losses and productivity
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39 increases are not sufficient to compensate for value added growth (dropping out) is typical of
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41 vulnerable regions achieving poor performance in the vulnerable sectors and having neighboring
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43 regions with a high market potential: these regions seem to grow because of the existence of a large
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45 market in neighboring regions.
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53 Vulnerable regions suffering from deindustrialization – i.e. industrial employment crisis, industrial
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55 productivity losses and value added decreases – are associated with large shares of public
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57 employment and of managers in SMEs. Moreover, the growth of these regions is characterized by
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59 high positive spillovers of growth: their manufacturing growth seems to depend on their
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geographical proximity to growing regions.

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6 Both industrial conservatism and economic take-off of vulnerable regions are characterized by high
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8 structural fund expenditures and a large share of tertiary activities. This might be a signal that
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10 public financial support and the development of the service sector act more on industrial
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12 employment dynamics than on industrial productivity growth.
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17 To exploit the potential of Figure 2, which simultaneously considers employment, value added and
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19 productivity increases, the spiders in Figure 5 are represented with the axes in the centre of each
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21 growth pattern quadrant rather than being evenly spaced. In this way, besides observing the
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23 differences among groups, we are also able to detect which variables have a positive or a negative
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25 effect, and on which of the three axes the effect is more evident. In particular, if the diagram of one
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27 variable is shifted upwards, this variable is associated with a positive effect on productivity; if the
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29 diagram is shifted rightwards, the association is with a positive effect on employment; if the
30
31 diagram is shifted up-and-rightwards, the variable is associated with a positive effect on GVA.
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39 As regards professions (Figure 5a), corporate managers are more frequent in the virtuous-cycle,
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41 restructuring and dropping out quadrants. For this reason, they appear to be associated with higher-
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43 than-average productivity growth. This is plausible, since they are a good proxy for the higher value
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45 added functions. By contrast, the managers of small enterprises are more frequent in the
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47 restructuring, dropping out and de-industrialization quadrants, which implies that they are mainly
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49 associated with low employment performance, since small enterprises are generally less able to
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51 meet the international challenges of globalization.⁷ Finally, lower-qualified office workers
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53 characterize the dropping out and de-industrialization patterns, i.e. regions which abandon the
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55 manufacturing sector in favour of the service sector.
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3 Figure 5b evidences three structural economic variables. The first is the share of human resources in
4 science and technology (HRST), which is especially large in the upper quadrants (and is hence
5 associated with positive productivity performance) but also in de-industrialization regions, which
6 may use their HRST endowment to move to the service sector. The share of self-employed workers
7 without employees, which represents the amount of micro-entrepreneurial self-made initiatives, is
8 highest in the quadrants of economic take-off and industrial conservatism, suggesting that these
9 initiatives are able to create employment but not productivity and also have little effect on GVA: in
10 the age of globalization, micro-firms appear to be a way to deal with unemployment rather than to
11 produce development. The third variable is the share of the tertiary sector, which is rather
12 homogeneous and hence does not appear to be a strong discriminant. However, it is stronger in the
13 quadrants on the left, and is hence associated with de-industrialization and dropping out, which are
14 easier for those regions where tertiary activities are more developed.
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48 Figure 5c represents the growth spillovers (calculated with the distance-weighted and size-weighted
49 GDP growth of neighboring regions) and income spillovers (calculated with the distance-weighted
50 GDP of neighboring regions) on vulnerable regions. They appear to be much stronger in the de-
51 industrialization and dropping-out quadrants. Hence, rather surprisingly, spillovers are not
52 positively associated with manufacturing performance for European vulnerable regions. Various
53 explanations are possible: first, the fact that many vulnerable regions in these two quadrants are
54 located in central Europe, which tends to be more accessible; second, the fact that spillovers do not
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3 affect all types of regions in the same way; but they do so differently according to their settlement
4 structure (CAPELLO, 2009); third, the possibility that, for vulnerable regions, their closeness to
5 strong regions is not an advantage but a problem, since this may hamper the growth of
6 manufacturing, which spills over to the stronger neighbors.
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15 Finally, represented in Figure 5d are the effects of policy support: in particular, total Structural
16 Funds expenditure 1994-99 and the sub-set of Structural Fund expenditure related to Social
17 Integration and Human Resources (Objectives 1, 2, 3 and 6 ESF). All of them exhibit a similar
18 pattern, stronger in the virtuous cycle quadrant but also in the economic take-off and industrial
19 conservatism ones. For this reason, Structural Funds support seems to be positive for vulnerable
20 regions, but has to be associated mainly with manufacturing employment growth, rather than with
21 manufacturing productivity growth.⁸
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33 34 4. Industrial Competitive Strategies and Regional Performance 35 36 37

38 39 4.1. *Competitive strategies and success factors* 40 41 42

43 The aim of this section is to highlight the role of the above-mentioned industrial competitive
44 strategies in the performance of vulnerable regions. Indeed, vulnerable regions do not constitute a
45 homogenous group, and different strategies imply different consequences on the economic
46 performance and structure of regions.
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55 Having no possibility to obtain any direct measure of the industrial competitive strategies, we adopt
56 an indirect approach and approximate them with the presence in the area of “success factors” that
57 can be potential outcomes of the strategies in the regions, namely:⁹
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3 1. *the degree of innovation*, as an outcome of a strategy of productivity gains via innovation,
4
5 measured in terms of share of employment in science and technology. This indicator is only
6
7 partially a proxy for innovation, since it captures technological advances, which are more
8
9 frequently achieved by large firms or by integrated ones. What this indicator does not
10
11 capture are all organizational, managerial and process innovations, which are as important as
12
13 technological ones for achieving productivity gains. Unfortunately, to our knowledge no
14
15 other data are available on these kinds of innovation;
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- 18
19 2. *the composition of the labour force with a predominance of high value-added jobs*, as a
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21 measure of the rationalization of low value added functions in favor of higher ones ¹⁰;
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- 24
25 3. *the degree of sectoral reconversion*, as an outcome of a reorganization strategy towards new
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27 sectors, measured by the *Lawrence* index.
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32 In addition to these three proxies, we control for four types of structural factors most frequently
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34 cited by regional development theories as affecting regional economic performance, in particular
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36 the sectoral, geographical and settlement structure of a region, and European policies, namely:
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- 38
39 - *the degree of sectoral specialization*; when specialization takes place in the most successful
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41 sectors, it becomes a driver of growth through multiplier effects on consumption and income
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43 generated by an increase in exports. In the same way, a specialization in non-dynamic
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45 sectors may lock a region into a vicious cycle of development (CAMAGNI, 1991). Regional
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47 specialization is expressed by the Herfindahl index;
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- 50
51 - *the relative geographical position vis-à-vis other regions*; because regional economies are
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53 open economies, closely integrated with each other, their growth patterns depend on the
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55 dynamics of other regions. This is calculated as the growth of regions other than region r
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57 discounted by the distance of each region from region r .
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- 60 - *the settlement structure of a region*, which may conceal economies or diseconomies of
agglomeration once a region is characterized by a high agglomeration structure. In order to

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3 take this factor into account, we use a dummy variable assuming value 1 if a region has a
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5 city with more than 300,000 inhabitants and with a population density of more than 300
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7 inhabitants / km sq. or a population density of 150 – 300 inhabitants / km sq.
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- 10 - *European policies sustaining regional growth*, expressed by structural funds expenditures.
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15 All these factors were tested on vulnerable regions in regard to different performance indicators: in
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17 particular employment, value added, and productivity dynamics. Structural differences between
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19 vulnerable and non-vulnerable regions in the success factors explaining economic performance
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21 were also tested. The analysis was run for both economic activities in general and for the
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23 manufacturing sector in particular, in order to highlight the differences. Table 1 presents the
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25 synthesis of the results of the econometric exercise.
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[INSERT TABLE 1 HERE]

4.2. Success factors and strategies in vulnerable regions

In analyzing the economic performances of vulnerable regions, we first investigate the impact of structural factors on the overall dynamics of employment, value added, and productivity, and then the impact on industrial dynamics (Table 1). In order to highlight the characteristics of vulnerable regions, we repeated the econometric analysis run on vulnerable regions on all regions and calculated the Chow test to capture statistically significant differences between the two sets of regressions (for detailed econometric results, see Table A2-A3 of Appendix 2).

If we look at the total employment dynamics, the analysis shows that the most significant factors of total employment dynamics in vulnerable regions are:

- technological innovation;
- share of high qualified workers (corporate managers);
- structural fund expenditures.

If we consider the first two indicators as the result of two strategies, namely higher productivity increases through (technological) innovation and reconversion to higher functions, these seem to perform an important role in employment growth. Interestingly, structural funds have an important job-creating role. By contrast, a sectoral reconversion has a negative relationship with employment growth, testifying that it has a cost in terms of job losses.

The Chow test is not significant in this case (Table A2 in Appendix 2), implying that factors explaining employment growth dynamics in vulnerable regions are not statistically different from those explaining all regional employment growth in Europe.

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3 Interestingly, the results change drastically when we analyze total value added growth. In this case,
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5 significant structural factors are:
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- 10 - technological innovation;
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- 12 - structural funds;
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- 15 - sectoral reconversion.
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20 The first result is rather important: higher value added gains are achieved through an innovation
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22 strategy, and a sectoral reconversion exerts positive effects on value added growth. Structural funds,
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24 too, positively affect value added dynamics.
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29 Only one factor explains value added growth in negative terms. This is the relative geographical
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31 position of regions with respect to other regions, as in the case of employment growth. This means
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33 that a region's location close to growing regions is detrimental to its value added growth; the region
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35 is more a donor than a receiver.
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41 The Chow test is rather significant in this case (Table A2 in Appendix 2): the factors explaining
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43 value added growth dynamics in vulnerable regions are statistically different from those explaining
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45 all regional value added growth in Europe. Sectoral reconversion loses its explanatory power, while
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47 a large degree of high value functions becomes significant in explaining value added growth in all
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49 regions.
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55 The last analysis concerns productivity growth. As expected, a sectoral reconversion strategy pays
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57 in terms of productivity gains. In this case, too, the Chow test is significant. Interestingly, no
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59 strategy or structural factor positively affects the dynamics of all European regions; the sectoral
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reconversion strategy has a role in productivity gains only in vulnerable regions.

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6 4.3. *Success factors in industrial growth in vulnerable regions: differences with respect to total*
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8 *growth*
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11 The analysis on structural factors in vulnerable regions in Europe was repeated for industrial
12 employment, and industrial value added over the period 1998 – 2005, and for industrial productivity
13 growth over the period 1998 – 2004 for NUTS2 regions (see econometric results in Table A3).¹¹
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20 We may deduce from Table 1 the differences between the structural factors of total employment
21 growth and industrial employment growth. With regard to technological innovation, this loses its
22 explanatory power in the case of industrial employment growth. This can be explained by the fact
23 that in manufacturing firms the capacity to exploit technological upgrading to create new jobs is
24 controversial: some firms adopt labour-saving innovation, others develop new jobs, having a non-
25 significant sign on average.
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37 Structural funds, which were positive for total employment growth, prove to be non-significant in
38 explaining industrial employment growth, and regional specialization changes its impact from non-
39 significant to negative. This result seems to evidence that the specialization of vulnerable regions in
40 vulnerable sectors is detrimental to their industrial employment dynamics.
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49 As regards the differences between industrial and total value added growth, innovation and
50 structural funds, which were significant for total value added growth, turn out to be non-significant
51 in explaining industrial value added growth, and regional specialization becomes positive.
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59 An annual average industrial productivity growth over the period 1998 – 2004 was regressed on the
60 usual structural factors.¹² The main results that differ from the analysis run in the case of total

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3 productivity growth regard regional specialization, which is significant and positive, and spillovers
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5 of growth, which are non-significant.
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10 Interestingly, the positive sign of regional sectoral specialization on productivity growth once again
11 highlights that specialization in a vulnerable sector does not necessarily mean a lower economic
12 performance: a sectoral openness to global markets, when accompanied by appropriate industrial
13 competitive strategies, turns out to be more a challenge than a threat.
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24 5. Conclusions

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29 The aim of this work has been to analyze, over the most recent period of time, the reasons for the
30 success within the so-called vulnerable regions, i.e. those European regions that are most exposed to
31 globalization trends. The analysis has been run on 102 European regions identified as those regions
32 specialized in sectors that are most open to international trade. The period of analysis is the most
33 recent period allowed by data availability, specifically the period 1995-2005. These reasons of
34 success have been identified through the structural elements that characterize regional economies
35 and that result from either historical endogenous development or active industrial strategies.
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48 The analysis yields a number of findings. First of all that specialization in vulnerable sectors is not
49 always detrimental to economic performance. Indeed, some vulnerable regions are among the
50 strongest European regions in terms of growth and/or value added per capita, which testifies that
51 specialization in a vulnerable sector may offer new opportunities of growth if regions are able to
52 implement effective reaction strategies.
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3 Regional performances and three possible positive reaction strategies have been identified by means
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5 of simple statistical indicators (growth of value added, of productivity and of employment; regional
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7 sectoral structure). These strategies are raising productivity through innovation in the same sector of
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9 specialization; cutting costs by changing to higher phases of the production process; and
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11 reconversion from low-value-added sectors to high-value-added ones. However, only the last two
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13 strategies appear to be implemented in a significant number of vulnerable regions.
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17 By means of a descriptive analysis it has been possible to show that the good economic growth
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19 patterns of vulnerable regions depend on certain endogenous factors, such as the presence of high
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21 value added functions, the presence of researchers, and the policy support received.
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27 However, not all the characteristics are identically associated with the three growth rates of value
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29 added, of employment, or of productivity. Hence, for each driver of growth, the effects of regional
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31 structure and characteristics have been investigated with a multivariate econometric investigation,
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33 generally confirming the results of the univariate descriptive analysis.
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39 The presence of high value added functions, of best performing vulnerable sectors, and of a high
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41 expenditure of structural funds on social integration and human resources turn out to be the push
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43 factors of local economies in these regions. In particular, structural funds have a decisive role in
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45 increasing employment growth. However, this positive role cannot be related to productivity gains,
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47 and this once again highlights the job-creating value of EU policies.
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52 Moreover, the only winning strategy with which regions can achieve higher productivity gains is
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54 sectoral reconversion at the expense of employment growth (see also GARDINER et al., 2004). In
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56 fact, sectoral reconversion always exerts a positive and significant effect on value added and
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58 productivity through a decrease in employment dynamics.
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3 The presence of high value functions affects employment growth, while, their effects on value
4 added and productivity gains remain unexplained. This holds for both manufacturing activities and
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6 economic activities in general.
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12 Productivity gains achieved through technological upgrading unexpectedly play an ambiguous role
13 in explaining value added and employment growth dynamics: technological innovation positively
14 impacts on total employment growth and total value added growth, but the result on productivity
15 gains is rather unclear, with a non-significant sign of the coefficient. This result can receive several
16 explanations linked to either the indicator used (which covers only one type of innovation) or the
17 non-efficient use of science and technology resources¹³.
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29 Globalisation is *an unavoidable process* for regional economies, and the best strategy for regional
30 economies to confront it is *adaptation to change* (see also FONTAGNÉ and LORENZI, 2005;
31 WAI-CHUNG YEUNG, 2009). Postponing such a strategy entails high risks for a local economy
32 obliged to take on global competition as a latecomer with respect to its competitors, increasingly
33 locked in old forms of production organisation, with limited complementary skills developed for an
34 adaptation strategy, and losing in the meantime important opportunities offered by globalisation
35 processes.
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49
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52 discussion, section 4 has been written by Antonio Affuso, sections 1 and 5 have been written by
53 Roberta Capello and sections 2 and 3 have been written by Ugo Fratesi.
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APPENDIX

Appendix 1: Definition and Identification of Vulnerable Regions

Vulnerable regions are defined in this work as those regions with a sectoral composition more exposed than others to external competition in a globalized world, as defined by the research teams engaged in the EU project mentioned in note 2. This definition therefore does not coincide with the EU definition of regions eligible for funding under the European Convergence objective and phasing-out system.

Our definition therefore does not imply that vulnerable regions always record negative economic performances; on the contrary, their economic growth patterns may be the result of renewed competitive strategies leading to new market opportunities.

The main problem that arises when measuring the degree of regional integration into global markets is the scarcity of data. In particular, in the absence of regional trade data, vulnerable regions are identified by means a two-step procedure which first identifies the sectors most exposed to foreign competition and then measures the regional specialization in those sectors.

The first step in our methodology for identifying vulnerable regions was the identification of vulnerable sectors. The definition of 'vulnerable sector' was based on the following statistical criteria:

- trade balance $(X-M)/(X+M)$ below the European average;
- import penetration rate (M/GVA) above the European average;
- growing importation ratio or declining trade balance (1999-2006), the threshold being the average European evolution.

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5 Application of these criteria led to the definition of four vulnerable sectors:¹⁴
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- 10 1) textiles, clothing (DB) and footwear and leather goods (DC) fit all criteria. They were
11 grouped together because they shared the same global characteristics (low-qualified labour,
12 similar geography, etc.) and had followed similar recent evolutions;
13
14
- 15 2) manufacturing of basic metals and fabricated metal products (DJ) is a much less open sector,
16 but its evolution has been negative in recent years, with growing openness to extra-
17 European competition and a deteriorating trade balance. However, this sector has high
18 internal differentiation, with deterioration of the trade balance being mainly concentrated on
19 non-ferrous metals;
20
21
- 22 3) electrical and optical equipment (DL) is a very open sector, and it has a very negative trade
23 balance, although it has been relatively stable in recent years. Like metal industries, this
24 sector is very heterogeneous, with very negative balances in office machinery and electronic
25 equipments, but not in very technological segments like scientific instruments. To be noted
26 is the growing importance of Central and Eastern Europe in this sector, even if the trade
27 balance remains slightly positive for EU15 vis-à-vis NMS;
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- 30 4) miscellaneous manufacturing industries (DN) have a very negative and deteriorating trade
31 balance. DN is by definition very heterogeneous, but faces negative evolutions in nearly all
32 subsectors, especially furniture and miscellaneous manufacturing activities (including
33 toyse).
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55 The second step was identification of vulnerable regions according to their specialization in sectors
56 particularly exposed to external competition. Vulnerable regions were defined as regions with more
57 than one standard deviation from the average of employment or added value in the vulnerable
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sectors, taken as a whole and separately (with the exception of the very heterogeneous miscellaneous sector DN).

Appendix 2. Database and Regression Results

[INSERT TABLE A1 HERE]

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[INSERT TABLE A2 HERE]

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[INSERT TABLE A3 HERE]

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Notes

¹ Studies exist on the impact of globalization on the location of firms. See among others STORPER et al., 2002; LONGHI et al., 2003; KENNEY and FLORIDA, 2004.

² The definition of vulnerable regions comes from a joint effort of the research teams engaged in a EU project – 2007.CE.16.0.AT.028 of the European Commission – in which the lead partner was the Free University of Brussels, with the Politecnico of Milan as a partner. For the methodological aspects of the definition of vulnerable regions, see Appendix 1.

³ Unlike in CAMAGNI (1991), here, in order to obtain relative values, we use the difference in the ratio between regional and European growth rates. This is because employment growth has been minimal and negative for the EU in the period considered. For small values, the two calculating methods tend to be similar.

⁴ There exists a large body literature on the causes of outsourcing and its effects. See among others FEENSTRA and HANSON (1999), BHAGWATI et al., (2004), AMITI and WEI (2005), GROSSMAN and HELPMAN (2005), MANKIW and SWAGEL (2006) and MARIN (2006).

⁵ There are a large number of case studies on regional restructuring in Europe: see for example CHAPMAN (2005), DUNFORD (2006), GAMBAROTTO and SOLARI (2008).

⁶ The target of our analysis is a period of increasing globalization and economic expansion. We are still not able to provide any statistically supported hint on whether the factors of regional success in years of sustained growth might not be the same which allow regions to suffer less downturns and economic crises.

⁷ See CLARK et al., 2004, for an analysis of the adjustment strategies of small and medium-sized firms to globalization in vulnerable regions.

⁸ This result is not uncommon in a large and much debated literature. See among others BOLDRIN and CANOVA (2001), RODRÌGUEZ-POSE and FRATESI (2004) and DALL'ERBA and LE GALLO (2008).

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⁹ Data were drawn from several databases: Espon, Eurostat, and European Labour Force Survey. The employment and value added data at regional (NUTS2) level have been estimated by IGEAT, a research centre of the Free University of Brussels. The authors thank IGEAT for providing these data. Full details of the data used are given in Table A1 of Appendix 2.

¹⁰ The EU Labour Force Survey contains data on the professions actually performed by the interviewed persons. In order to approximate the presence in the region of high-value added functions, we hence use the regional share of people working as managers, excluding the public sector. Since we do not have any data on wages, we are not able to know if these high-level jobs are highly paid, nor we are able to discuss about the relationship between the earnings distribution and the productivity gaps. For a recent analysis of the effects of income polarization on regional growth, see EZCURRA (2009).

¹¹ The period of analysis is chosen according to data availability.

¹² This is the only case in which the dummy on agglomeration economies interferes with the other explanatory variables. For this reason, it has not been inserted.

¹³ For a discussion on the possible available indicators of innovation see SMITH (2006), while on the potential discrepancy between the presence of innovative assets and the actual capability of a region to use them to grow, see BILBAO-OSORIO and RODRIGUEZ-POSE (2004), CRESCENZI (2005) and CRESCENZI and RODRIGUEZ-POSE (2009).

¹⁴ For detailed description of the methodology and the database, see project 2007.CE.16.0.AT.028 of the European Commission, available on the EU website.

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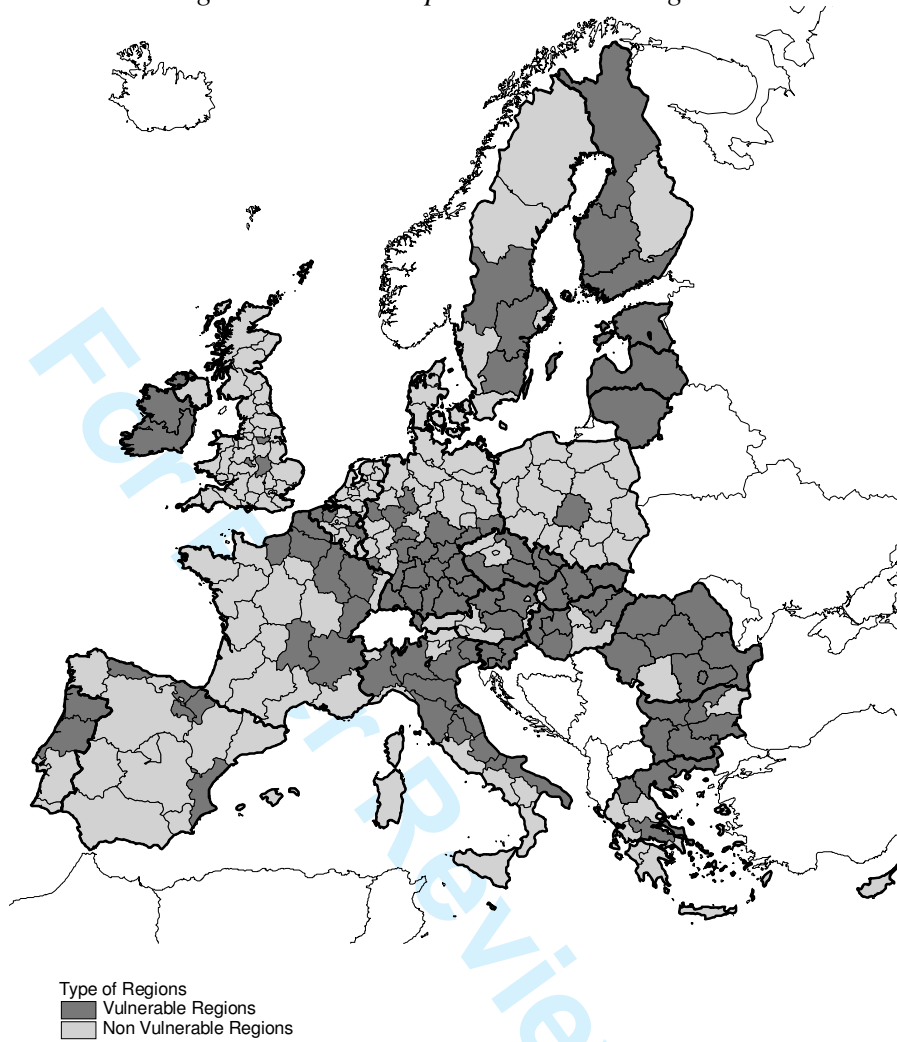
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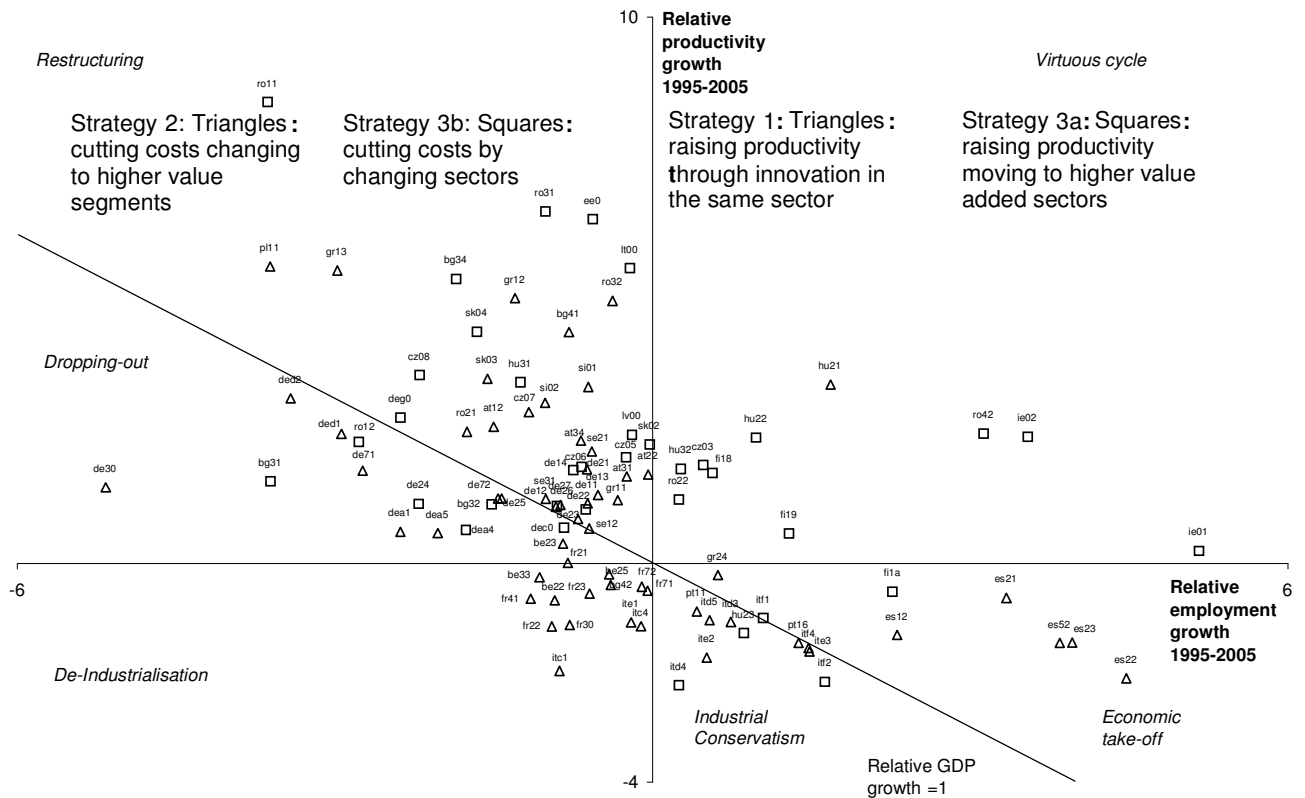
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Figure 1 - The European vulnerable regions



Source: IGEAT regional/sectoral employment matrix

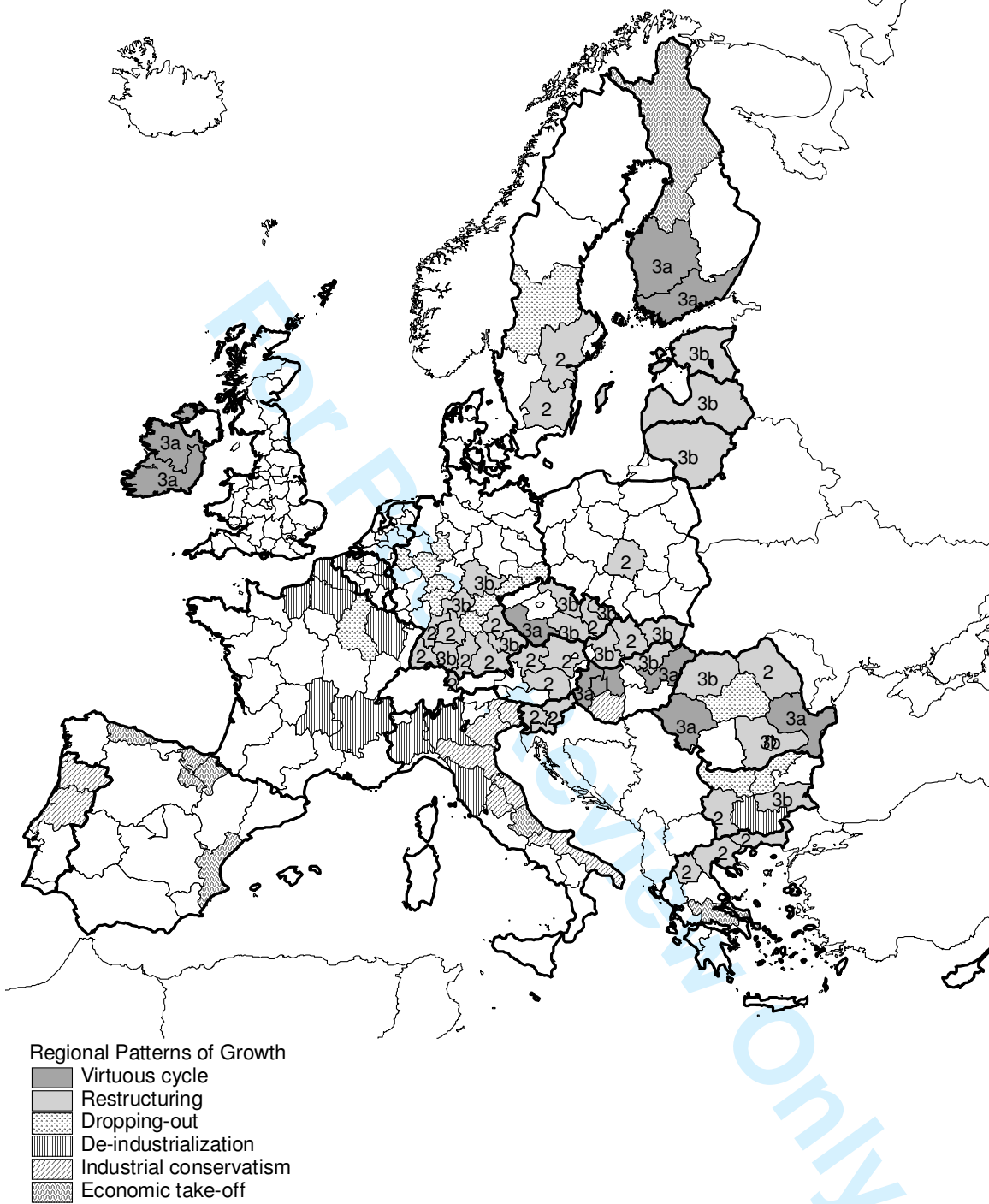
Figure 2 - Industrial growth patterns of vulnerable regions – 1995-2005



Legend: squares= higher- than-average sectoral change; triangles: lower-than-average sectoral change.
Source: our elaborations on Eurostat data

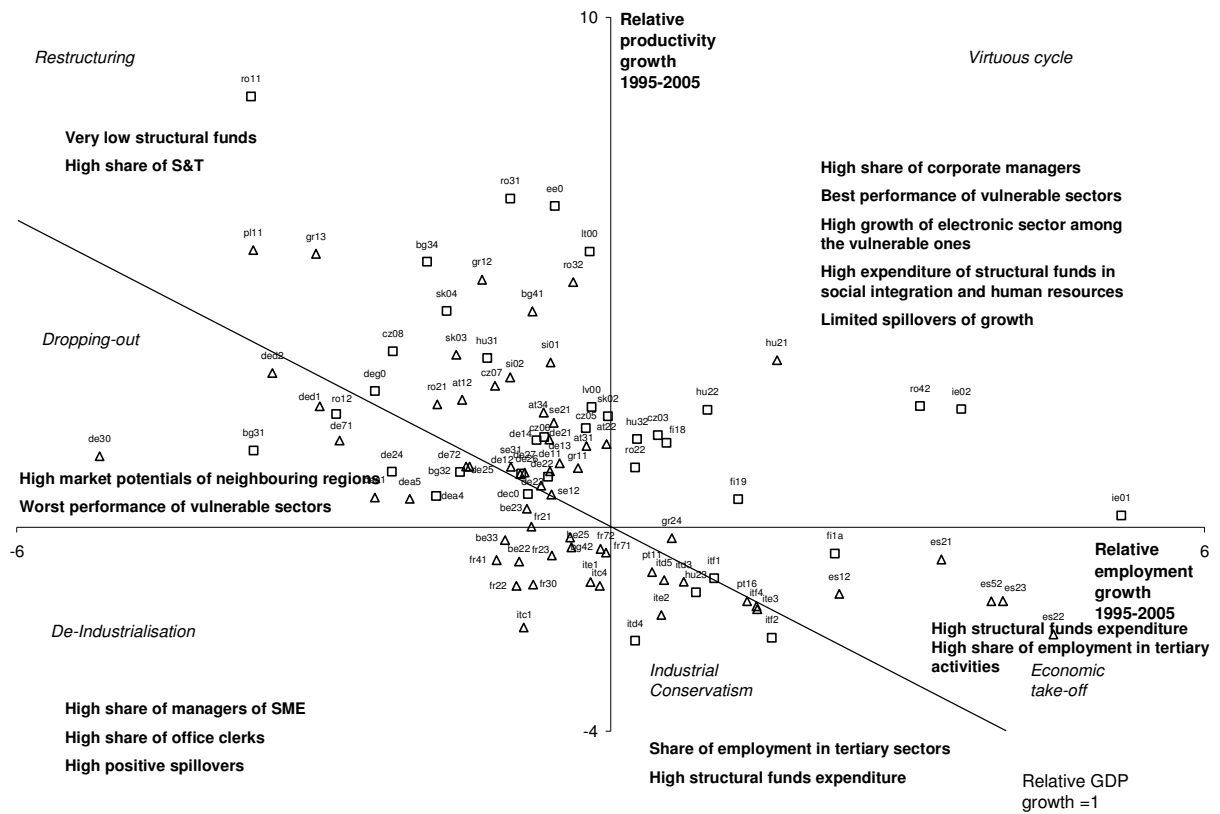
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Figure 3 - The growth patterns followed by European vulnerable regions



Source: our elaborations from Eurostat data

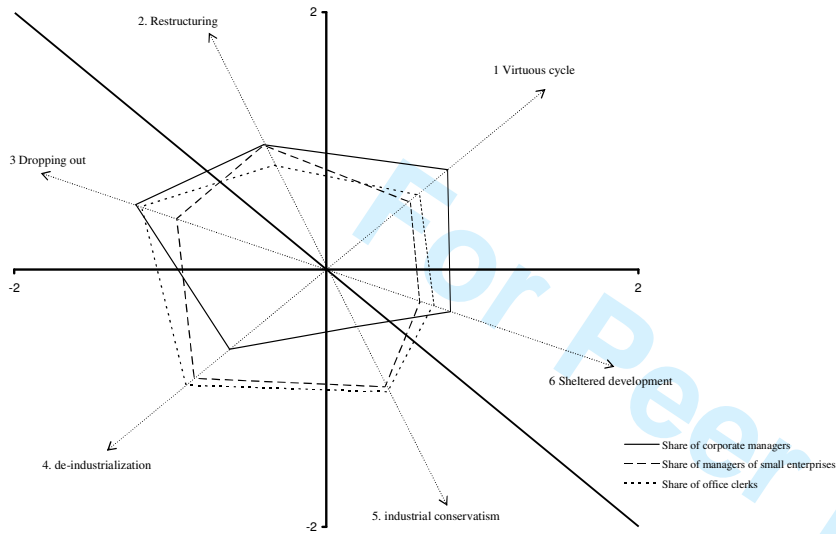
Figure 4 - Structural features associated to each industrial growth pattern



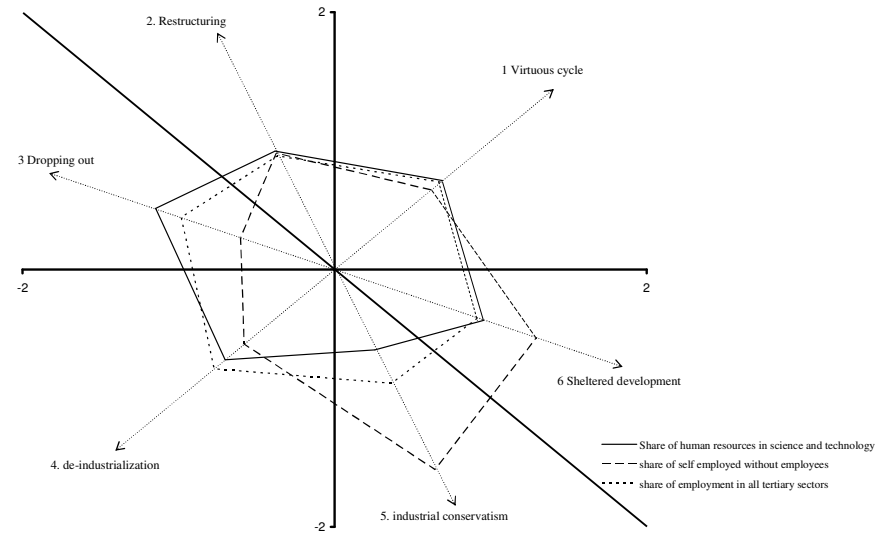
Source: our elaborations from Eurostat data

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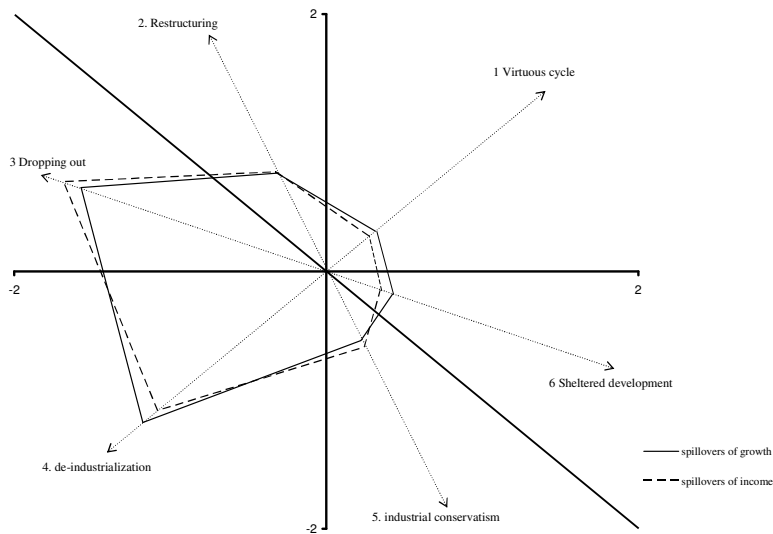
Figure 5 - Description of vulnerable regions according to their growth pattern typologies



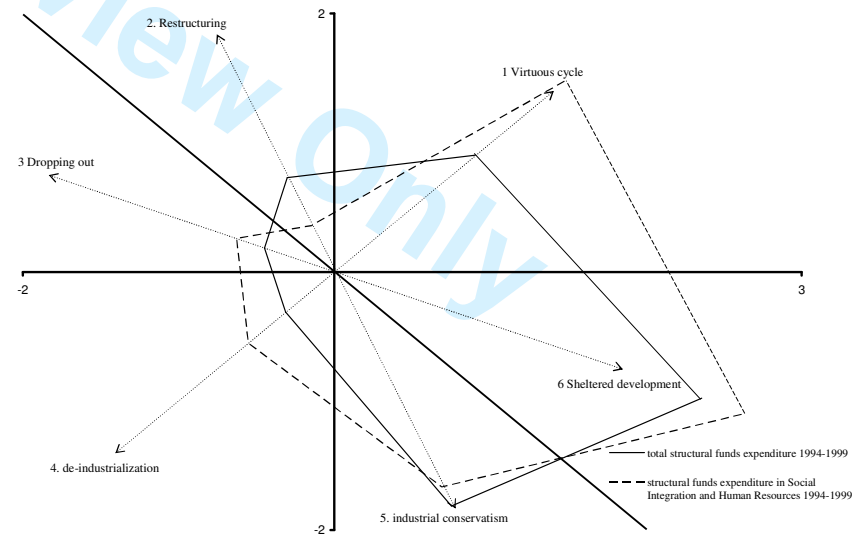
A Professions (source: Labour Force Survey)



B Human resources in science and technology, self employment and tertiary sector (Source: Eurostat and IGEAT matrix)



C Growth spillovers and market potential (Source: our elaboration on Eurostat data)



D Structural funds (Source: ESPON database)

Table 1 - Success factors in the economic and industrial performances of European vulnerable regions

		Positive effects	Negative effects	Non-significant
Δ total employment	- technological innovation ;	X		
	- share of high-skilled workers;	X		
	- structural fund.	X		
	- regional specialization;			X
	- growth spillover.		X	
	- sectoral reconversion		X	
	- agglomeration economies			X
Δ total value added	- technological innovation;	X		
	- share of high-skilled workers;			X
	- structural fund.	X		
	- regional specialization;			X
	- growth spillover.		X	
	-sectoral reconversion	X		
	- agglomeration economies			X
Δ total productivity	- technological innovation;			X
	- share of high-skilled workers;			X
	- structural fund.			X
	- regional specialization;			X
	- growth spillover.		X	
	-sectoral reconversion	X		
	- agglomeration economies		X	
Δ industrial employment	- technological innovation;			X
	- share of high- skilledworkers;	X		
	- structural fund.			X
	- regional specialization;		X	
	- growth spillover.		X	
	-sectoral reconversion		X	
	- agglomeration economies			X
Δ industrial value added	- technological innovation;			X
	- share of high-skilled workers;			X
	- structural fund.			X
	- regional specialization;	X		
	- growth spillover.		X	
	-sectoral reconversion	X		
	- agglomeration economies			X
Δ industrial productivity	- technological innovation;			X
	- share of high-skilled workers;			X
	- structural fund.			X
	- regional specialization;	X		
	- growth spillover.			X
	- sectoral reconversion	X		

Source: results from regression analyses in annex 2

Table A1. Regional economic data and variables

Indicators	Definition	Source of raw data
Regional GDP	Regional GDP in real terms at NUTS2 level in the period 1995-2005, computed from the nominal one, using national GDP deflators.	Eurostat
Regional employment growth of the tertiary and manufacturing sectors.	Regional employment growth of the tertiary and manufacturing sectors, computed from absolute employment in the years 1995 to 2005.	Eurostat
Regional employment by NACE 2 sector	Regional NUTS2 employment for each NACE 2 sector for the year 2002	IGEAT matrix*
Location quotient by NACE 2 sector	Regional share of employment or value added by sector for the years 1995 and 2002 at NUTS2 level.	IGEAT matrix
Regional value added by NACE 2 sector	Regional value added for each NACE 2 sector for the years 1995 and 2002	IGEAT matrix
Regional employment by function (ISCO)	Regional employment by function at ISCO 2 digit classification at Nuts 2 level.	European Labour Force Survey
Regional share of human resources in S&T	Share of people working in S&T on population at NUTS 2 in the year 2000	Eurostat
Per capita structural funds	Total structural funds expenditure / population in the period 1994-1999. Also divided into 5 types of expenditure.	Espon database
Agglomerated regions	With a city of > 300,000 inhabitants and a population density > 300 inhabitants / km sq. or a population density 150 – 300 inhabitants / km sq.	Espon database

*The employment and value added data at regional (NUTS2) level have been estimated by IGEAT, a research centre of the Free University of Brussels. The authors thank IGEAT for providing these data

Table A2. Success factors in European regional economic growth: results from regression analyses

Economic performance measures	Δ total employment			Δ total value added			Δ total productivity		
	All sample	Vulnerable regions	Non-vuln. regions	All sample	Vulnerable regions	Non-vuln. regions	All sample	Vulnerable regions	Non-vuln. regions
Success factors									
Innovation	1.338 * (0.000)	.748 ** (0.023)	1.899 * (0.001)	.520 * (0.008)	1.059 * (0.008)	.474 ** (0.044)	-.762 *** (0.075)	.010 (0.983)	-1.604 ** (0.018)
High v.a. functions	.784 * (0.005)	.746 ** (0.031)	.893 *** (0.056)	.464 * (0.007)	.634 (0.124)	.380 ** (0.045)	-.016 (0.973)	-.379 (0.629)	-.474 (0.475)
Regional specialization	.385 (0.274)	-.432 (0.112)	.802 (0.159)	.154 (0.647)	-.816 (0.198)	.339 (0.400)	-.051 (0.927)	-.073 (0.938)	.255 (0.739)
Sectoral reconversion	-.718 * (0.003)	-.937 * (0.004)	-.640 *** (0.083)	-.166 (0.252)	.579 ** (0.044)	-.441 * (0.005)	.469 (0.133)	1.231 ** (0.015)	-.043 (0.910)
Agglomeration economies	-.056 (0.320)	.005 (0.902)	-.122 (0.205)	-.111 ** (0.012)	-.098 (0.198)	-.057 (0.299)	-.070 (0.386)	-.156 ** (0.036)	.086 (0.515)
Spillovers of growth	-.141 * (0.008)	-.260 ** (0.025)	-.190 ** (0.026)	-.003 (0.645)	-.591 * (0.000)	-.003 (0.769)	-.100 (0.364)	-.366 ** (0.077)	.056 (0.629)
Structural funds expenditures	.129 * (0.000)	.095 * (0.000)	.155 ** (0.014)	.057 ** (0.012)	.074 * (0.006)	.040 * (0.005)	-.066 (0.27)	.002 (0.959)	-.107 ** (0.040)
R-square	0.28	0.40	0.28	0.16	0.39	0.16	0.08	0.23	0.10
N. of observations	184	82	102	227	88	139	171	78	93
Chow test	1.029			4.703*			1.693***		

Legend:

* Significant at 1% level

** Significant at 5% level

*** Significant at 10% level

Coefficients represent the marginal effects of a 1% increase in each independent variable on the dependent variable.

Estimates have been estimated with "robust" standard errors and with the constant term.

Table A3. Success factors in European regional industrial growth: results from regression analysis

Industrial performance measures	Δ total employment			Δ total value added			Δ total productivity+		
	All sample	Vulnerable regions	Non-vuln. regions	All sample	Vulnerable regions	Non-vuln. regions	All sample	Vulnerable regions	Non-vuln. regions
Innovation	.904 ** (0.033)	.435 (0.494)	1.239 *** (0.061)	-1.906 * (0.007)	-1.268 (0.258)	-1.536 *** (0.092)	-1.112 ** (0.035)	-.118 (0.836)	-1.635 ** (0.041)
High v.a. functions	1.370 * (0.003)	1.496 * (0.000)	1.16 (0.127)	.766 (0.378)	-1.188 (0.347)	1.673 (0.161)	.507 (0.568)	-1.177 (0.146)	1.090 (0.440)
Regional specialization	-.351 (0.636)	-1.743 * (0.002)	.628 (0.556)	3.703 * (0.000)	2.482 * (0.009)	3.644 ** (0.017)	2.162 * (0.001)	2.362 * (0.000)	2.000 *** (0.084)
Sectoral reconversion	-.886 ** (0.023)	-.934 ** (0.037)	-1.085 *** (0.072)	-.397 (0.447)	1.715 *** (0.068)	-1.536 * (0.003)	-.064 (0.857)	1.188 ** (0.019)	-.582 (0.235)
Agglomeration economies	-.232 * (0.008)	-.061 (0.538)	-.322 ** (0.022)	-.204 (0.127)	-.274 (0.159)	-.059 (0.720)	-	-	-
Spillovers of growth	-.341 * (0.000)	-.752 * (0.000)	-.321 * (0.003)	-.674 * (0.006)	-1.907 * (0.000)	-.634 ** (0.018)	-.159 (0.260)	-.336 (0.125)	-.141 (0.460)
Structural funds expenditures	.225 * (0.000)	-.015 (0.758)	.325 * (0.000)	.013 (0.825)	.039 (0.641)	.069 (0.446)	-.197 * (0.000)	-.054 (0.332)	-.254 * (0.000)
R-square	0.30	0.32	0.34	0.24	0.46	0.30	0.11	0.25	0.14
N. of observations	183	80	103	204	88	116	184	81	103
Chow test	1.402			5.365*			1.742***		

Legend:

* Significant at 1% level

** Significant at 5% level

*** Significant at 10% level

Coefficients represent the marginal effects of a 1% increase in each independent variable on the dependent variable.

Estimates have been estimated with "robust" standard errors and with the constant term.

+ This is the only case in which the dummy on agglomeration economies shows multi-collinearity with the other explanatory variables. For this reason, it has not been inserted.