

## EDUCATION AND GEOGRAPHICAL DIFFERENCES

*The Geographical Distribution of High- and Low-skilled Human Capital in Belgium, 1961-2001*

**- Raf Vanderstraeten, Kaat Louckx & Frederik Van der Gucht -**

The expansion of education is considered to be one of the most important social changes to have occurred in Europe during the second half of the twentieth century : ever more younger people study for ever longer. However, not all sections of the population participate in the expansion of education in the same way. In historical, just as in sociological, research, the emphasis until now has been on 'social' differences and 'social' inequalities in the field of education, such as the differences between boys and girls, or between young people from different class or ethnic backgrounds. By contrast, in this article we will look in more detail at the socio-geographical differences in educational participation and formal qualifications in Belgium in the second half of the twentieth century..

## I. Introduction

Social transitions are generally extremely complex. They cannot be reduced to single, specific causes. They have many side effects – both expected and unexpected. They also often continue to persist to differing extents, with all sorts of inequalities as a consequence.

The rise of the so-called knowledge economy in the western world is undoubtedly characterized by great complexity. One important element of this transition is the shift from an industrialised society, with a dominant secondary sector, to a type of society in which the tertiary and quaternary sectors are becoming increasingly important. Other elements are accompanying changes, such as the gradual supplanting of the management principles of 'Taylorism' and 'Fordism', with their emphasis on systems of mass production and mass consumption, and the resulting consequences for the organization of work: more flexibility in production processes, greater competitiveness, the emphasis on innovation and change, the outsourcing of so-called non-core activities, the diffusion of new systems of managerial control (skilled and 'autonomous' technicians instead of unskilled machine-operators), and so forth<sup>1</sup>.

In this context, one may furthermore think of the rise of new occupations and the disappearance of existing ones, as well as the growing demand for highly skilled workers and the exclusion of unskilled people. The discussions about human capital point to the changing political and economic expectations regarding education. Since the latter part of the twentieth century, the labour market has become increasingly organized around educational degrees and credentials.

According to many commentators, the economic mobilization of the 'available talents' has led to more social equality – at least in terms of educational opportunities for all. At the same time there is still concern about the continued existence of old, and the emergence of new, forms of social inequality<sup>2</sup>. In that regard, certainly in sociology, the emphasis and attention of both sociologists and policy-makers has traditionally been directed towards inequalities linked to class, gender, ethnic, or racial origin. Here, we explore another approach. Such differences have also recently been documented once more for Belgium<sup>3</sup>.

Hereafter, however, a somewhat different track will be followed with our attention directed to the uneven geographical distribution of

1. See, for example, GEORGE RITZER, *The McDonaldisation thesis*, London, 2004, p. 59-70; FRANS LAMMERTYN, "Sociaal werk in verandering. Het maatschappelijk decor" ([http://soc.kuleuven.be/web/files/11/66/1\\_F\\_Lammertyn\\_Tijdsdiagnose\\_Congres\\_sociaal\\_werk.pdf](http://soc.kuleuven.be/web/files/11/66/1_F_Lammertyn_Tijdsdiagnose_Congres_sociaal_werk.pdf), 2009, p. 11-15).

2. See, for example, ROY NASH, "Equality of educational opportunity : In defence of a traditional concept", in *Educational Philosophy and Theory*, 2004, no. 4, p. 361-377; RICHARD BREEN & JAN O. JONSSON, "Inequality of opportunity in comparative perspective : Recent research on educational attainment and social mobility", in *Annual Review of Sociology*, 2005, p. 223-243; PATRICIA M. McDONOUGH & AMY J. FANN, "The study of inequality", in PATRICIA J. GUMPORT (ed.), *Sociology of higher education : Contributions and their contexts*, Baltimore, 2007, p. 53-92.

3. STEVEN GROENEZ, "Onderwijsexpansie en -democratisering in Vlaanderen", in *Tijdschrift voor Sociologie*, 2010, no. 3-4, p. 199-238.

the expansion of education in Belgium. In recent American socio-geographical research, an increasing spatial concentration of highly skilled workers is reported. In a knowledge-intensive economy, the *skilled city* flourishes. Rather unexpectedly, and in spite of a policy intended to leave no one behind, the rise of the post-war knowledge-based economy in the United States is leading to a greater geographical *segregation* of human capital<sup>4</sup>. Here we ask the question how such processes operate in the 'Old Continent', and specifically in Belgium.

From that point of departure, we first focus on the increasing shares of adult populations with university degrees and the emerging spatial divergences. We do not, however, only focus on the highly skilled. In the second part of the paper, we devote attention to the other face of the rapid post-war expansion of education. When it becomes more or less self-evident to participate in (higher) education, *not* participating becomes a liability. In a 'credential society', exclusion from education seriously affects one's career chances so that early school leavers become increasingly defined as 'dropouts'<sup>5</sup>. In the second part of this paper, we therefore focus on the changing

spatial distribution of the populations of early school leavers. In both of the following parts, the historical evolutions and geographical differences within Belgium remain central. Moreover, we particularly pay attention to the 'regional' differences within Belgium, especially between the regions of Flanders and Wallonia.

Because of the lack of existing studies about geographical divergence in educational participation in Belgium and its causes, this article first and foremost tries to provide a broad and detailed overview of the situation. It aims at an exact description and interpretation of the geographical distribution of high- and low-skilled people in Belgium in the second half of the twentieth century. For this purpose, use was made of the data of the general censuses, which have been organized by the national government at (more or less) ten-yearly intervals since 1846. Detailed data about education and schooling were collected for the whole population via the censuses of 1961, 1970, 1981, and 1991, as well as via the *General Socio-Economic Survey 2001*, which is the most recent successor to the classical censuses<sup>6</sup>. These counts have certain limitations, not only because of technical

4. See EDWARD L. GLAESER & ALBERT SAIZ, "The rise of the skilled city", in *Brookings-Wharton Papers on Urban Affairs*, 2004, p. 47-94; CHRISTOPHER R. BERRY & EDWARD L. GLAESER, "The divergence of human capital levels across cities", in *Papers in Regional Science*, 2005, no. 3, p. 407-444; EDWARD L. GLAESER, *Cities, Agglomeration and spatial equilibrium*, Oxford, 2008; EDWARD L. GLAESER & JOSHUA D. GOTTLIEB, "The wealth of cities : Agglomeration economies and spatial equilibrium in the United States", in *Journal of Economic Literature*, 2009, no. 4, p. 983-1028. For some applications of socio-geographic methods in historical research, see the essays in the recent thematic issue, on "Historical GIS [Geographical Information Systems] and the study of urban history", of *Social Science History*, especially JASON A. GILLILAND, SHERRY H. OLSON & DANIELLE GALVREAU, "Did segregation increase as the city expanded? The case of Montreal, 1881-1901", in *Social Science History*, 2011, no. 4, p. 465-503. 5. See, for example, RANDALL COLLINS, *The credential society. An historical sociology of education and stratification*, New York, 1979; DAVID B. BILLS, *The sociology of education and work*, Oxford, 2004, p. 47-61. 6. JWe have made use of the following publications of the Nationaal Instituut voor de Statistiek (NIS) : *Statistieken der gediplomeerden van het Hooger Onderwijs in België*, Brussel, Universitaire Stichting, 1938;

deficiencies in the collection and processing of the data<sup>7</sup>. However, in our opinion we have been able to avoid systematic biases or inconsistencies, because we here present data from – within the period dealt with here – (relatively) well-defined and well-institutionalized educational levels.

On account of the restricted space available to a journal article, here we will only present charts for the censuses of 1961 and 2001. The tables, however, also present data for the interim period, so that the transitions which took place during the second half of the twentieth century can be analyzed more precisely.

## II. The highly-skilled

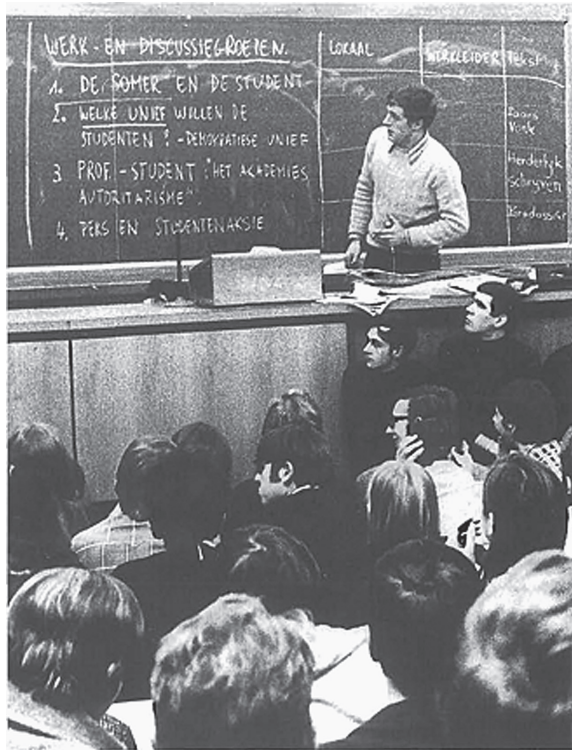
The interests of the statistical authorities reflect social changes: the earliest official statistics about the composition of the school population and about the educational level of the adult population follow on from twentieth-century developments in education and society. It is no accident that the first

count of university graduates, in 1937, took place as part of a more broadly designed economic survey. The attention of the University Foundation, which processed the data, was primarily directed to the ‘problem of unemployment among intellectuals’<sup>8</sup>. However, the 1937 data was not embedded in a general census (with data for the whole population); nor was the data coupled with demographic and socio-geographic categories of classification (such as age and place of residence). Data series which make it possible to study systematically the evolution of levels of training for the whole resident population of Belgium are not available until the ten-yearly general population censuses, conducted from 1961 onwards.

### - The situation in 1961

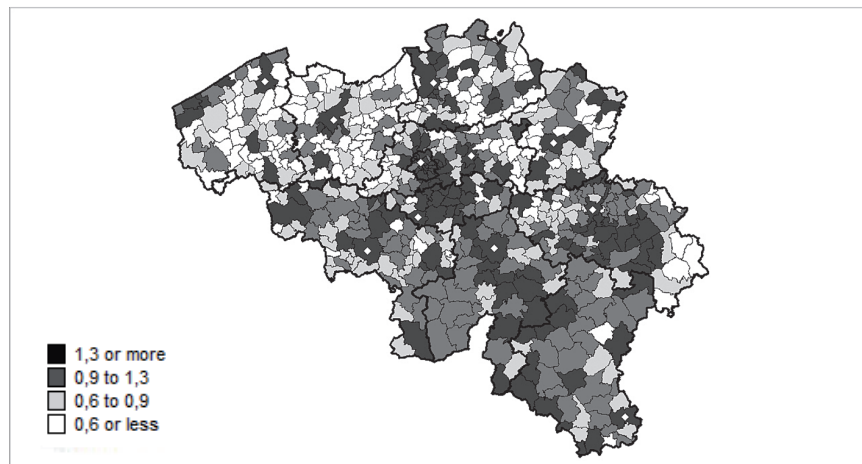
As a point of departure, chart 1 gives an overview, by municipality, of the share of the adult population<sup>9</sup> with a university degree on 31 December 1961. To make the data comparable, it is broken down according to the present-day municipal classification: through a series of amalgamations the total number of municipalities in Belgium has been

*Volkstelling (31 december 1961), deel 1 : Bevolkingscijfers*, Brussel, NIS, 1963; *Volkstelling (31 december 1961), deel 10 : Onderwijsniveau van de bevolking*, Brussel, NIS, 1966; *Volkstelling (31 december 1970), deel 1 : Bevolkingscijfers*, Brussel, NIS, 1973; *Volkstelling (31 december 1970), deel 10 : Onderwijsniveau van de bevolking*, Brussel, NIS, 1975; *Volkstelling (1 maart 1981), deel 1 : Bevolkingscijfers*, Brussel, s.d.; *Algemene volks- en woningtelling op 1 maart 1991, deel 10 : Schoolbevolking en onderwijsniveau*, Brussel, NIS, 1996; *Algemene volks- en woningtelling op 1 maart 1991, monografie nr. 1 : De bevolkingsevolutie. De bevolking naar leeftijd en geslacht*, Brussel, NIS, 2001. Although most of the data for the municipality level has never been published, that level of detail can be achieved on the basis of what is available in the archives of the NIS. We are grateful to Paul Van Herck (NIS), Sven Vrielinck (HISSTAT, UGent) and Didier Willaert (VUB) for their help during the search for, and the processing of, these more detailed data. <sup>7</sup> See RAF VANDERSTRAETEN, “Statistische constructies : De beroepsstatistiek in België en Groot-Brittannië”, in *Belgisch Tijdschrift voor Nieuwste Geschiedenis*, 2005, no. 2-3, p. 201-241. <sup>8</sup> *Statistieken der gediplomeerden van het Hooger Onderwijs...*, p. 5. <sup>9</sup> The regular school-population (that is, that part of the population which still attends school full-time) is not taken account of in these percentages. The term ‘adult population’ or ‘adults’ is used in this article to mean all adults (18 years old or more) who no longer attend school on a daily basis.



*Paul Goossens, one of the leaders of the student movement in Leuven during the 1960s, lecturing about the democratization of university education. Note the Dutch 'progressive spelling' on the blackboard, used to voice protest against 'academic authoritarianism'. (Photos Archives KULeuven)*

**Chart 1 : The spatial distribution of the share of adult populations with a university degree across the 589 municipalities of Belgium in 1961, in four equal groups**



brought down from 2,663 in 1961 to 589 from the 1980s. In the charts provided here, these 589 municipalities are divided into four categories of broadly similar size (each of between 146 and 148 municipalities). The darker the shading of the municipality, the higher the level of university graduates there. Dark-grey- and black-shaded municipalities score above the median; light-grey- and white-shaded municipalities lie below it. Alongside, a number of statistical measures have been calculated. To make the interpretation of the various charts easier, white boxes have been used to indicate the national capital and the ten provincial capitals – among them also Nivelles and Louvain which, as a consequence of the splitting of the bilingual province of Brabant early in 1995, became the capitals of *Brabant Wallon* (Walloon Brabant) and *Vlaams-Brabant* (Flemish Brabant).

It is especially noteworthy that at the end of 1961 only 1.6% of adult Belgians were in possession of a university degree. The unweighted average share at municipality level was 1.11%. There was a standard deviation of 0.88 at municipality level<sup>10</sup>. Regional inequality in terms of university degrees was thus very great in 1961. The left end of the distribution was cut off by the null value, but the right end of the distribution was particularly long. The ultimate points of the distribution lay at 0.2% (the rural municipality of Landen) and 9.0% (Woluwe-Saint-Pierre in the Brussels Region). The median was 0.87% (that is, 1 in 115 adult inhabitants). This value divides the light- and dark-shaded municipalities in chart 1.

A first glance at chart 1 gives the impression that there is little structure to this patchwork.

<sup>10</sup>. The standard deviation is a statistical measure that indicates how much variation or dispersion exists from the average. The standard deviation is expressed in the same unit as the average. A low standard deviation indicates that the values cluster close to the average of the distribution, a high standard deviation the opposite.

The municipalities with a high share of adults with a university degree (shaded black) are often distant from each other. They are dispersed over the whole country and are surrounded by grey or white municipalities (with average or low levels of university degrees). Nevertheless, urbanisation plays a great role. In the large and medium-sized cities, the percentage of university-educated people is undoubtedly higher than elsewhere. All the provincial capitals belong to the highest category. In 1961 around half (50.3%) of all university-qualified people in Belgium lived in only seven cities: Brussels, Antwerp, Liège, Ghent, Charleroi, Louvain and Namur. At the same time, only 27.1% of all inhabitants in Belgium lived in these places. At the municipality-level, the correlation between the percentage of university-qualified people and the total number of inhabitants is 0.25; that with the (relative) population density amounts to 0.40. In the Capital Region of Brussels alone, more than a quarter (27.2%) of the highly trained population was resident, although only 11.1% of the total adult population lived in Brussels.

After further examination, the difference between the regions also becomes apparent: the share of adults with university degrees in the Dutch-language part of the country (Flanders) was lower than that in the French-speaking part (Wallonia). Of adult Flemings, in 1961, 1.22% possessed a university degree, against 1.43% of Walloons (that is, 17.3% more). In Brussels, as many as 3.66% of

the adult population was in possession of a university degree (that is, around 200% more). Large cities scored comparatively highly across the whole country, but in Wallonia many other municipalities also scored highly, or very highly. In the Flemish countryside municipalities, on the other hand, there were few to very few individuals with a university degree in 1961. Because the ultimate points of the distribution diverge widely, there exist great differences. In 120 of the 308 Flemish municipalities, the share of adults with a university degree was lower than 0.6%; these are shaded white on chart 1. But only 27 of the 235 Walloon communities fell in this category (and 7 of these 27 communities were in the German-speaking district of Eupen-Malmedy)<sup>11</sup>.

Chart 1 thus also gives a view of the 'regional' relationships existing in Belgium to the middle of the twentieth century. University education was still in important ways a French-language concern in the whole of Belgium, Flanders not excepted, until 1960. In Ghent, the adoption of a Dutch-only policy 'dutchified' university education from 1930 onwards. In Louvain (at that time home to the country's largest university), the first 'Flemish courses' were organised in 1935. However, it was not until the end of the 1960s that Louvain became entirely 'dutchified'. In 1968, this Catholic university was officially divided into a Dutch-language *Katholieke Universiteit te Leuven*, and a French-language *Université Catholique de Louvain* (built on a new site at

**11.** In the Oostkantons or Cantons de l'Est in 1961, only 0.65% of the adult population (that is, 277 out of a total of 42,480 adults) was in possession of a university degree. It should also be noted that in the Eupen-Malmedy district (which belonged to the German Reich until the end of the First World War, but since then has been included in the Walloon Region) there is not a single German-language university institution to this day.

Louvain-la-Neuve). In Brussels, a new Dutch-language university (VUB) was established in 1969/1970 next to the existing French-language ULB (which was inaugurated in 1834 shortly after Belgium's independence). Since the supply of education in part creates the demand for it, the comparatively low level of participation in university education in the Dutch-language area in the 1960s should not come as a surprise. Language still formed a handicap.

The economic differences that still existed in Belgium in the middle of the twentieth century are also important. Brussels and the other provincial capitals were characterized by a high concentration of management activities (in the secondary and tertiary sector of the economy) and of the professions. Alongside this, the rural character of Flanders contrasted with the more outspoken industrial character of Wallonia, especially in the Walloon industrial valley (which extends from Mons and Charleroi in the west to Liège in the east). The economic activity in the Walloon industrial valley provided for a comparatively high income. In this economic structure, however, highly skilled workers played only a limited role; the coal and steel industries ran for the most part on semi- and unskilled labour. With the exception of the cities, which offered more employment in the service sector, the share of adults with university degrees was not high throughout the entire industrial valley. Until the middle of the twentieth century, one might argue, Belgium's (industrial) economy

hardly relied on educational credentials or the production of specialized human capital. Rather, the opposite appeared to be the case: higher education was strongly dependent on the economy, and investments in higher education depended on economic wealth.

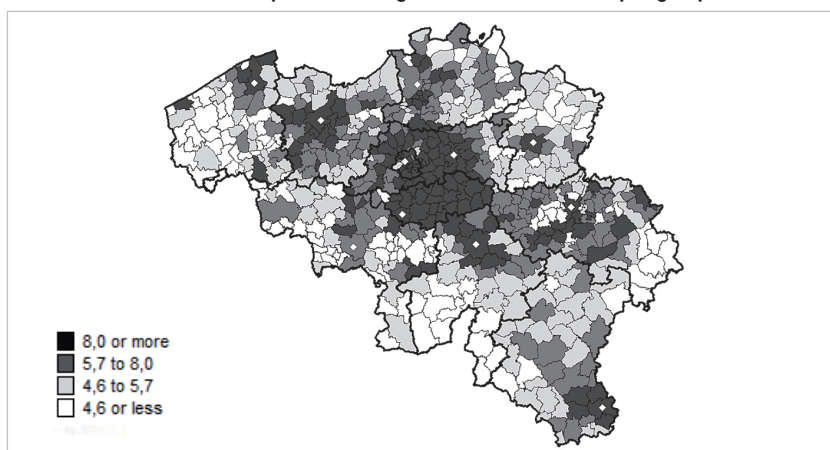
#### **- The situation in 2001**

Since the 1960s, separate institutional regions have been created based on the country's linguistic divisions. Following the constitutional partition of 1962-63, political jurisdiction over education has gradually been transferred to the regional level. Very few matters related to education have remained at the national or federal level. In the 1980s, the function of a national minister for education also disappeared from the central government. In Belgium, the post-war expansion of higher education has thus been organised in a 'regionalised', Dutch- or French-language context<sup>12</sup>. Since the 1960s, moreover, in education policy much attention has been paid to the geographical distribution of institutions for higher education. Not only were 'small' university institutions enlarged to become full-blown Dutch- or French-language universities (with bachelor's and master's programmes): with an eye to the democratization of higher education, new Dutch-language university institutions were also founded in Antwerp, Brussels, Diepenbeek/Hasselt and Courtrai, and new French-language institutions in Arlon, Mons, Charleroi, Gembloux and Namur. There is as yet not much research on the effects of these

12. There are today three levels of decision-making with their respective structures of legislative and executive power. Three cultural communities – the Dutch-, French- and German-language communities – and three economic regions – the Flemish, Walloon and Brussels Region – have been recognized. There are also four language regions: aside from the Dutch-, French- and German-language communities, there is the bilingual region of Brussels. For reasons of simplicity, we use 'regions' as an overarching concept.



**Chart 2 : The spatial distribution of the share of adult populations with a university degree across the 589 municipalities of Belgium in 2001, in four equal groups**



developments. But chart 2 and chart 3 provide an overview of the geographical distribution of the university graduates on 1 October 2001. chart 2 depicts the distribution of the share of all the adults with a university degree on 1 October 2001; chart 3 offers an overview of the spatial segregation of university graduates aged between 25 and 34 at that time.

In analyzing chart 2, it must first be noted that the expansion of university education in the second half of the twentieth century was impressive. In 2001, the median value (at the municipality-level) of the shares of inhabitants with a university degree lay at 5.7%. The average was 7.8%, that is, five times higher than 40 years earlier. However the standard deviation also increased to 4.1. The strong growth of adults with a university degree thus has not been accompanied by homogenisation : the standard deviation in 2001 was still 52% of the average. In 2001, too, university graduates remained unevenly

spread throughout the country's population. The minimum value of the distribution was 1.5% (in Menen in the south-west of Flanders, situated on the French/Belgian border), while the maximum value was 28.9% (once again for the residential community of Woluwe-Saint-Pierre or Sint-Pieters-Woluwe in the bilingual Brussels Capital Region).

In comparison with the data of chart 1, a number of shifts can be pointed out. Firstly, there is the clearly visible difference between the centre and the periphery of the country. More than half of the municipalities in the highest, darker-shaded category lie in the centre of the country. In the largest cities (and also in their immediate surroundings) likewise, many highly-educated people live. If we look at absolute numbers, then in 2001 half of all those with university diplomas were spread over 45 large Belgian municipalities (the municipalities of Brussels were again counted together here). In total, 36.4% of all

adult inhabitants in Belgium lived in these municipalities. The correlation with the total number of inhabitants in 2001 is 0.14, and at the same point in time the correlation with the density of population is 0.29.

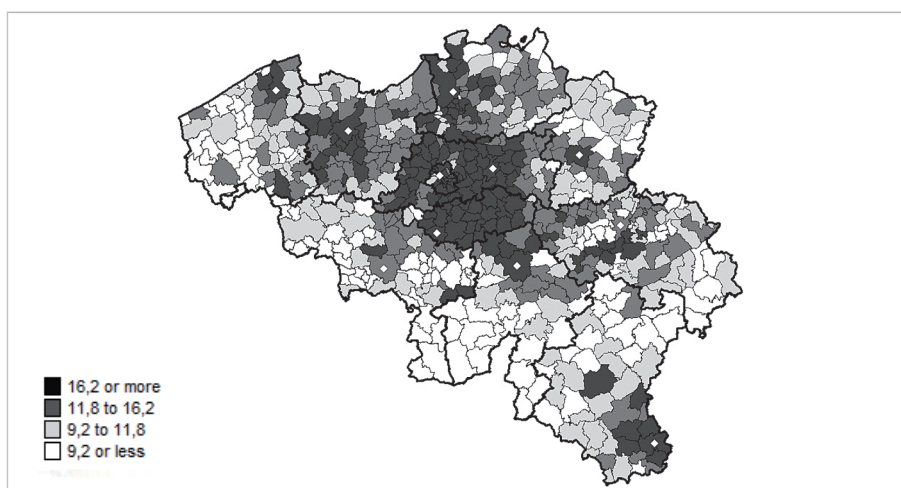
There are also higher shares of university graduates in the more prosperous urban and suburban areas. In and around most of the larger cities (such as Ghent, Louvain, Antwerp, Bruges, Mons, Charleroi and Arlon), the share of university graduates increased sharply between 1961 and 2001. The suburbanisation of the 1960s and 1970s in Belgium did not only lead to a depopulation of the inner cities, but also led to their degradation. While transportation costs were low, many high- or middle-income households could easily migrate to the periphery<sup>13</sup>. The sharp rise of the share of university graduates in the suburban areas is thus also a result of the migration of such families to these areas. For the Capital Region of Brussels (or its extended metropolitan area), moreover, the economic, political and military globalisations during the last decades have led to the concentration of innumerable administrative activities in the 'capital of Europe'. It is no exaggeration to state that the attractiveness of this global city for university graduates is today negotiated within a transnational space<sup>14</sup>.

Next to these differences between centre (or centres) and periphery, but rather less visible, is the difference between the regions. In 2001, Flanders had built up a slight lead over Wallonia : 7.4% of the Flemish population, against 6.7% of the Walloon, held a university degree. That is a remarkable shift, given the situation in 1961. The expansion of the share of the population with university degrees in the second half of the twentieth century thus took place more quickly in Flanders than in Wallonia.

Perhaps this shift constitutes an illustration of what Jan Romein once described as the 'dialectics of progress' (or literally translated from the Dutch expression : the 'law of the inhibiting head start')<sup>15</sup>. According to Romein, technological innovation creates the conditions for the development of a situation where one falls behind. The development and the use of a particular technology can set in train the development of a particular industry. But interest groups can emerge which benefit from maintaining their position and not giving an opportunity to alternative or new technologies. Specialization in one area may yield brief success, but eventually the area will fade, and the comparative advantage will decay<sup>16</sup>. Wallonia was one of Europe's main industrial powers during the nineteenth

13. See CHRISTIAN KESTELOOT, "Verstedelijking in Vlaanderen : problemen, kansen en uitdagingen voor het beleid in de 21<sup>ste</sup> eeuw. Task force stedelijk beleid : theoretisch kader" ([http://www2.cddc.vt.edu/digitalfordism/fordism\\_materials/Kesteloot.pdf](http://www2.cddc.vt.edu/digitalfordism/fordism_materials/Kesteloot.pdf), 2001, p. 21-25). 14. On this, see also PATRICK DEBOOSERE, "Brussels : a city, a region, a place to live", in *What does geography teach us about the future of Belgium's institutions?*, Brussels, 2010, p. 19-37 (<http://www.rethinkingbelgium.eu/rebel-initiative-files/ebooks/ebook-7/Re-Bel-e-book-7.pdf>); JACQUES-FRANÇOIS THISSE & ISABELLE THOMAS, "Brussels within the Belgian Economy : A geo-economic approach", in *What does geography teach us about the future of Belgium's institutions?*, Brussels, 2010, p. 5-18 (<http://www.rethinkingbelgium.eu/rebel-initiative-files/ebooks/ebook-7/Re-Bel-e-book-7.pdf>). 15. JAN M. ROMEIN, *Het onvoltooid verleden*, Amsterdam, 1937, p. 47-50. 16. CHRISTIAN KESTELOOT, "Verstedelijking in Vlaanderen...", p. 25.

**Chart 3 : The spatial distribution of the share of 25- to 34-years-old with a university degree across the 589 municipalities of Belgium in 2001, in four equal groups**



and early twentieth century, but its coal and steel industries relied strongly on less-skilled workers. There were few vested interests in such traditional industries and their labour markets in the northern, industrially less developed part of the country. In this setting, Flanders could more easily emphasise the production of human capital during the latter part of the twentieth century. However, the increasing divergences of human capital levels between Wallonia and Flanders should not obscure the fact that the differences *within* each region are greater than the differences *between* the regions.

Lastly, chart 3 offers, as a supplement to chart 2, an overview of the geographical distribution of university graduates between 25 and 34 years of age in Belgium in 2001. The differences from chart 2 are minor. There is certainly no significant change; the

previously sketched trends also hold for the young(est) generations of university graduates on the labour market. In comparison with the whole adult population, the share of university graduates among 25- to 34-year-olds is approximately twice as high and the median of the distribution has increased from 5.7 to 11.8. The minima and maxima of the other groups have more or less doubled, too. But, because the growth in all municipalities took place in around the same measure, there is little visible difference between both charts. Yet as we will see in the second part of this paper in our discussion of the spatial distribution of early school leavers and unskilled labour, new geographical disparities may also emerge.

#### **- Distribution**

In order to quantify the geographical inequalities in Belgium and its regions between



*The province of Limburg did not have its own university until 1973 when the Limburg University Center opened its doors. About 300 students took courses in medical and natural sciences. Today the university offers a much wider range of educational courses and the number of students has multiplied tenfold. (Photos Archives UHasselt)*

$$DI_u = \frac{1}{2} \sum_{com.} \left| \frac{\text{Adults w. UD}_{com.}}{\text{Total Adults w. UD}} - \frac{\text{Adults w. o. UD}_{com.}}{\text{Total Adults w. o. UD}} \right|$$

1961 and 2001, an adapted version of the *dissimilarity index* has been used (which, in the academic literature, is often used to calculate the spatial distribution of migrants or of religious or ethnic groups within a particular country)<sup>17</sup>. In the formula given above, Adults w. UD<sub>com.</sub> refers to the number of adults in the local community with university degrees, whereas Adults w.o. UD<sub>com.</sub> refers to the number of adults in the local community without university degrees.

The dissimilarity index is bounded between 0 and 1: the higher the value, the stronger the segregation. By means of this index, we have calculated the geographical distribution of university graduates in Belgium and its institutional regions for each of the population censuses held from 1961 to 2001. The time path of this index is shown in table 1<sup>18</sup>.

For 1961 the DI<sub>U</sub> value for Belgium was 27.7%. This can be interpreted as the share of people with a university degree who would have to move for there to be a completely even or uniform distribution of people with university degrees across all local communities within the larger unit (here : Belgium). In 2001 the value of this index for Belgium was slightly lower, at 23.0%. The decline of heterogeneity (or dissimilarity) took place between the censuses of 1961 and 1991. In the last decade of the twentieth century, however, a clear increase of dissimilarity appeared. All in all, the time path of this dissimilarity index shows that the geographical distribution of university graduates in Belgium remains rather unequal and that the concentration or segregation of highly educated human capital remains relatively high.

**17.** There are various indices or coefficients for measuring equality versus inequality, or clustering versus dispersion. The best-known is perhaps the Gini-index, which is mostly used to measure inequalities of income in a particular country or a particular region. Another familiar variant is the Herfindahl- or Herfindahl-Hirschman-index. For our research question, the use of the dissimilarity index (which is not associated with a particular author or 'inventor') is, however, the best fit. **18.** In comparison with international results for the distribution of, for example, ethnic or religious groups, the values of the D<sub>H</sub> do not appear especially high. See, for example, CHRISTOPHER R. BERRY & EDWARD L. GLAESER, "The divergence of human capital levels across cities..."; PETER BEYER, "From far and wide. Canadian religious and cultural diversity in global/local context", in LORI J. BEAMAN & PETER BEYER (eds.), *Religion and Diversity in Canada*, Leiden/Boston, 2008, p. 9-39; KURT GEPPERT & ANDREAS STEPHAN, "Regional disparities in the European Union : Convergence and agglomeration", in *Papers in Regional Science*, 2008, no. 2, p. 193-217. See also THIERRY EGGERICKX, CHRISTIAN KESTELOOT, MICHEL POULAIN, K. PELEMAN, TRUUS ROESENS & H. VANDENBROECKE, *De allochtone bevolking in België*, Brussel, NIS, 1999. In comparison with recent data about the distribution of degree-holders from polytechnic institutions in Belgium, however, the value of the D<sub>H</sub> appears remarkably high. These data are not included here. For the censuses of 1961 and 1970, the data about what came to be known as Non-University Higher Education are not very reliable. A good many of the educational courses in NUHE were barely distinguishable from the educational courses at the secondary level. They were at one point counted as secondary education, at another point not.

**Table 1 : Segregation by educational credentials :  $DI_U$  - values for adults with a university diploma in Belgium and its regions, calculated at the level of the local communities, and expressed in percentages**

	<b>1961</b>	<b>1970</b>	<b>1981</b>	<b>1991</b>	<b>2001</b>
<b>Belgium</b>	19.1	18.8	14.1	11.6	10.3
<b>Flanders</b>	17.5	15.2	11.6	9.8	8.2
<b>Wallonia</b>	17.5	14.4	12.5	8.5	8.8
<b>Brussels</b>	14.5	13.9	12.3	10.9	13.6

The differences between the regions are also noticeable. In 1961, heterogeneity was clearly still high : the  $DI_U$ -value for Belgium was higher than the values for the individual regions. Within those regions, heterogeneity was highest in Flanders. For 1961 the index-value for Flanders (with 308 municipalities) was 24.3%. The value declined to 18.4%. As the time span of the index in table 1 indicates, however, the decline took place principally in the 1970s and 1980s. In the last decade of the twentieth century there was stagnation : the measure of homogeneity/heterogeneity did not change for Flanders between 1991 and 2001. In contrast to this, the time span of the  $DI_U$  for Wallonia (with, at that time, a total of 235 municipalities) is somewhat capricious. Between 1961 and 2001, geographical inequality increased slightly; the index evolved from 21.6 to 23.6%. At the census in 1981, the  $DI_U$  for Wallonia was at its highest (23.9%). For the Capital Region of Brussels, which includes merely 19 municipalities, we

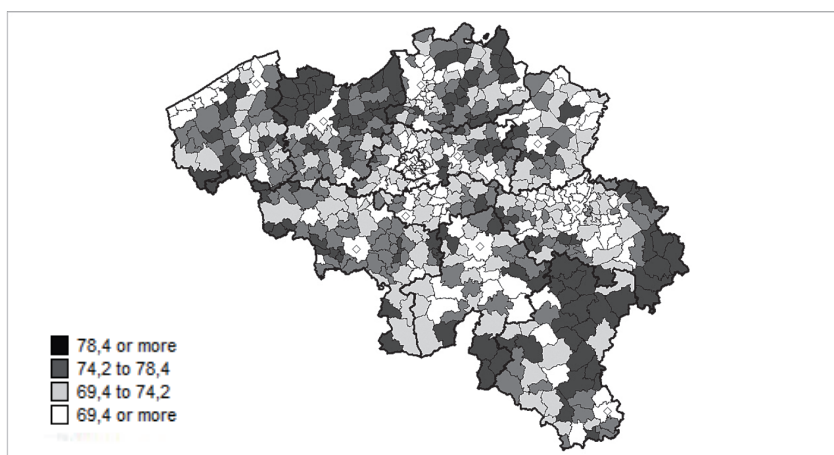
can see a comparably capricious path, with a slight increase apparent over the whole period : from 22.4 to 23.4%.

There was a clear decline of heterogeneity in Flanders in the 1970s and 1980s. All in all, the changes in the geographical distribution of university graduates during the second part of the twentieth century were quite modest. As the foregoing charts and data illustrate abundantly, clear spatial divisions remained within Belgium and its institutional regions. There was no increase in inequality – unlike the United States, where there have been reported mild increases (of ca. 10%) of the segregation of highly skilled university-trained workers in the period between 1970 and 2000<sup>19</sup>. But, in spite of the strong increase in the number of university graduates (in absolute as well as in relative terms), there is no indication of convergence or homogenization within the limits of Belgium or one of its regions either. Still about a quarter of the university graduates

**19.** In the United States, it appears that net gains in migration correlate primarily with two factors: climate conditions on one hand, and the presence of institutions for higher education on the other. *Sunbelt cities* in states such as Florida or California became expanding cities, as a consequence of, amongst others, the invention of air conditioning and medical progress in the struggle against 'tropical' diseases. But regions with a high production of human capital in the foregoing decades were evidently also highly attractive – such as the Boston Area with its renowned university education system. On this, see CHRISTOPHER R. BERRY & EDWARD L. GLAESER, "The divergence of human capital levels across cities...".



**Chart 4 : The spatial distribution of the share of adult populations with only primary schooling across the 589 municipalities of Belgium in 1961, in four equal groups**



among the adult population would have to be relocated to another local community in order to obtain an even or uniform mix with the other, less-schooled parts of the adult populations. Although in a small country with many transport options, such as Belgium, 'distance' is a relative concept, one's place of residence remains a relevant variable. Even in Belgium, geographical differences condition the range of available educational opportunities. From a socio-geographical point of view, too, the university remains an elitist institution.

### III. The lowly-skilled

There is, in view of the take-off of the present-day knowledge society, a tendency to focus attention on higher education. A knowledge-intensive economy always primarily revolves

around the highly-skilled; the strong relation between schooling on the one hand, and technological innovations or patent registrations on the other, is, among other things, frequently pointed out in the academic literature<sup>20</sup>. But, in a knowledge society, the geographical distribution of the highly skilled cannot be the only matter of importance. In this section of the article, attention will therefore be directed to the other end of the spectrum: the distribution of the early school leavers and the low-skilled population in Belgium. In this section, the geographical distribution of the part of the population without degrees, or at the most with lower or lower-secondary education, will be further investigated.

#### - The situation in 1961

Chart 4 presents an overview of the geographical distribution of the share of the adult population with only primary schooling in

<sup>20</sup>. For example, MICHAEL KREMER, "Population growth and technological change : One million B.C. to 1990", in *Quarterly Journal of Economics*, 1993, no. 1, p. 35-78; CHRISTIAN MERSCH, *Die Welt der Patente, Dissertation Kultur- und Sozialwissenschaftliche Fakultät Universität Luzern*, Luzern, 2010, p. 93-178.

1961. In Belgium, (school) education was compulsory until the age of 14 for most of the twentieth century. The first Belgian compulsory schooling law was passed in 1914, while the 1983 Education Act prolonged compulsory schooling to the age of 18. Primary education was divided into 'degrees' of two years each, after the third of which pupils could move on to secondary (and higher) education or continue to the fourth degree of primary school (for 13 and 14-year-olds)<sup>21</sup>. The 1961 census data make it clear that until 1961 a very large part of the population opted for this extended primary schooling instead of moving on to secondary education. In 1961, more than two-thirds of the Belgian adult population (68.7%) had only completed primary education. In most local communities, the share was still higher. The median value was 74.4%; the minimum and maximum values of the distribution were 37.4 percent (once again for Woluwe-Saint-Pierre) and 94.8 percent (for the community of Burg-Reuland in the German-speaking part of the country).

Chart 4 is to some extent the mirror image of chart 1: the correlation between both data series is -0.74. In other words, the higher the share of early school leavers, the lower the share of university graduates (and vice versa). This strong inverse relationship is not trivial. It is a relationship between the two ends of the spectrum; the middle part (among whom all those with 'only' a secondary education qualification) is not taken into account. It suggests that different, if not opposing, concentration forces are at work at both ends of the spectrum.

Two other structural inequalities in the distribution of educational credentials in Belgium need to be highlighted. While almost all major Belgian cities were characterized by a relatively high share of university graduates in 1961 (see chart 1), they also had a relatively small share of early school leavers among their adult populations. Within the group of large or relatively large cities, there was but one exception to this rule, namely the industrial town Charleroi. The correlation between the share of the early school leavers and the absolute number of inhabitants was -0.26 in 1961. The correlation with the relative population density had at that time a value of -0.37. In 1961, moreover, there was a structural difference between centre and periphery at the national level. The distance to Brussels had a clear impact on the 'school-mindedness' of the populations in the different local communities, showing a correlation of 0.38 in 1961. The shares of early school leavers were generally lowest in the country's centre and highest in the less urbanized parts and geographically furthest communities of Belgium. In a centralized country, such as Belgium, the kind of expertise monopolized by the university was especially valued in and around the country's capital (and regional or provincial capitals). These centres offered more employment in the human-capital-intensive service sector, making higher education a good option to pursue there, but less so elsewhere.

In the years after the end of the Second World War, the societal expectations vis-à-vis schooling remained modest for quite some time in most Western countries. In the post-

21. See DIRK DE CEULAER, *De verlenging van de leerplicht : Veertig jaar Belgische onderwijspolitiek*, Leuven, 1990, p. 310-314.





*Master graduates in Humanities (class of 2009) of Ghent University, together with their professors and tutors dressed in ceremonial cap and gown, at the entrance of the university assembly hall after the formal graduation ceremony. (Photo Universiteitsarchief Gent)*

war national economies of Europe, managers or employers did not yet employ large numbers of trained or skilled workers. On the labour market, primary schooling mostly sufficed. Only gradually has the importance of high-skilled human capital increased. While innovative or high-tech firms today tend to employ primarily skilled workers, for most of the twentieth century, innovative firms founded by skilled people tended to employ large numbers of unskilled. In a way, this can be compared to the difference between iconic figures such as Henry Ford and Bill Gates. Both individuals were themselves skilled, but Ford's assembly production involved vast numbers of unskilled workers. Using the management principles of F.W. Taylor, Ford's managers could organise and divide work so that it could be carried out by low- and unskilled workers. Gates' company, on the contrary, primarily employs more skilled, university educated workers. At present, skilled people seem increasingly likely to start firms that hire other skilled people. Skilled people also increasingly innovate in ways that lead to more employment for other skilled people<sup>22</sup>. As a consequence, educational credentials are, or have become, of increasing relevance in the knowledge-based economy.

In the preceding section of this article, the recent shifts in the geographical distribution of highly-trained university graduates were discussed in detail. Next, we will analyse such changes with respect to the early school

leavers in the 589 Belgian municipalities in greater detail. The following analysis not only points to the new chances and possibilities created by the knowledge-based economy. Particularly with regard to the clustering of the less-educated in different areas, it also points to the educational inequalities that have been deepened by the transitions related to the rise of the knowledge-based economy. Overall, new problems and new geographical inequalities appear to be developing in Belgium and its institutional regions (Brussels, Flanders and Wallonia).

#### **- The situation in 2001**

The average period of schooling has increased markedly over recent decades. This increase has motivated a policy concern about early school leavers and unskilled labour. During the second half of the twentieth century, the prolongation of the period of mandatory schooling has been an important political issue in many western countries including Belgium. In Belgium, the 1983 Education Act extended compulsory education until the age of eighteen, and is still in force, unaffected by the transfer of educational jurisdiction to the regional level. Legislation on compulsory education is one of the very few matters which has remained national or federal. The 1983 Act was perhaps the most important attempt to increase the average level of training, and especially to reduce the variation at the left extreme of the training spectrum<sup>23</sup>. But did this Act also have the same impact everywhere?

22. See EDWARD L. GLAESER & ALBERT SAIZ, "The rise of the skilled city..."; RUDOLF STICHWEH, "Wissensgesellschaft und Wissenschaftssystem", in *Schweizerische Zeitschrift für Soziologie*, 2004, no. 2, p. 147-165. 23. See RAF VANDERSTRAETEN, "De gevolgen van de leerplichtverlenging voor de grootte van de schoolbevolking", in *Tijdschrift voor Onderwijsrecht en Onderwijsbeleid*, 1993/94, no. 1, p. 19-23; ID., "Educational expansion in Belgium : A sociological analysis using systems theory", in *Journal of Education Policy*, 1999, no. 5, p. 507-522.

**Chart 5 :** The spatial distribution of the share of adult populations with only primary or lower-secondary schooling across the 589 municipalities of Belgium in 2001, in four equal groups

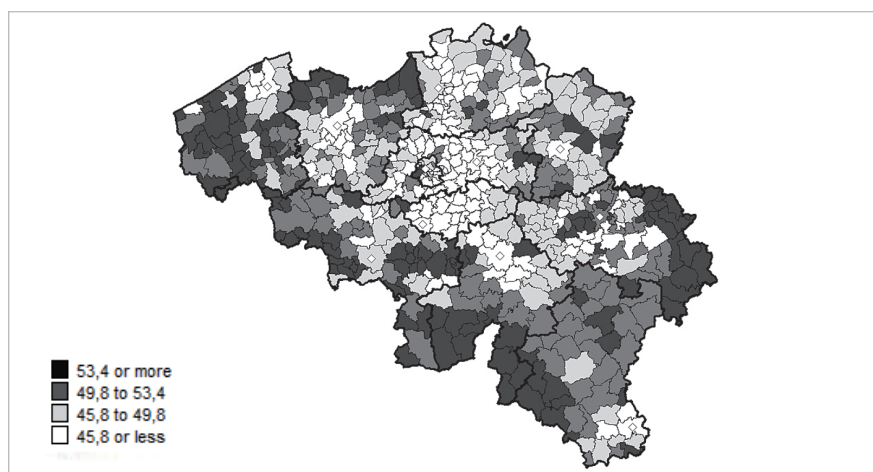


Chart 5 presents an overview of the geographical distribution of the share of early school leavers in Belgium as registered by the 2001 *General Socio-Economic Survey*. In order to take into account the rapid expansion of secondary and higher education as well as the prolongation of the period of compulsory education, we have here focused on the adults who have only completed primary or lower-secondary education. We have, in other words, focused on adults who have completed at most nine years of schooling. Overall, chart 5 provides more or less a mirror image of chart 2. Although the absolute differences between the local communities are rather limited, the relative differences between the nation's centre and its periphery are clear. The geographically peripheral communities of Belgium are characterized by the highest shares of early school leavers and

the urbanized communities in the centre of the nation by the lowest.

This chart, however, also (and above all) shows the effects of increased life expectancy and the demographic ageing of the population in the latter part of the twentieth century. In 2001, there were still many early school leavers among the population's oldest. As chart 4 illustrates, it has long been common to leave school as early as legally possible. But many adults with only a primary or lower-secondary educational qualification were by 2001 no longer economically active<sup>24</sup>. In the light of the recent expansion of secondary and higher education, it seems particularly relevant to focus attention on the patterns of educational exclusion among the members of the youngest generation. The bottom end of the human capital distribution among the

24. RAF VANDERSTRAETEN, "Onderwijsdeelname en onderwijsverdeling", in ELS WITTE, JAN DE GROOF & JEFFREY TYSENS (red.), *Het schoolpact van 1958. Ontstaan, grondlijnen en toepassing van een Belgisch compromis*, Brussel/Leuven, 1999, p. 717-740.

newcomers to the labour market also matters. Chart 6, therefore, plots the spatial distribution of the shares of young adults who do not meet the current expectations regarding schooling.

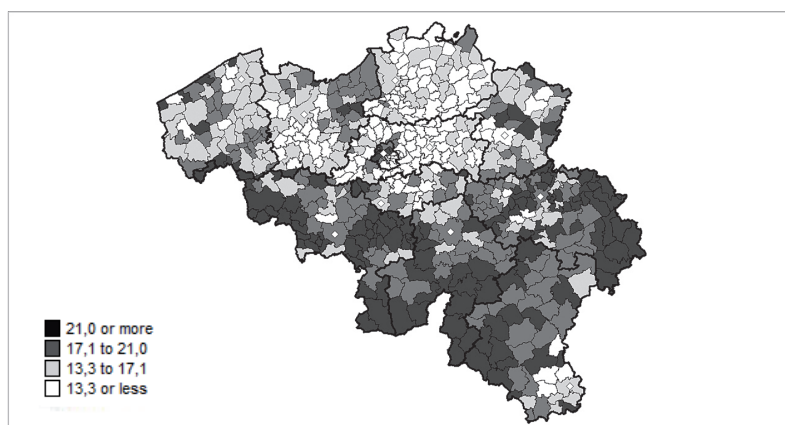
It now is a common hypothesis that education helps areas to adapt their economies to new technologies, as human capital enables people to adapt well to change. It may, however, also be argued that a relatively high share of early school leavers or dropouts constitutes an indication of local or regional decline<sup>25</sup>. Regional success in a knowledge-based economy may not only depend on an abundance of university educated, skilled entrepreneurs; a local neighbourhood may also succeed by avoiding having large numbers of less-skilled or less-educated workers in its local labour market. The data presented in chart 6 show the geographical distribution of the less-skilled among the younger generation within Belgium. During the first half of the twentieth century, as we have seen, large parts of the population *only* spent the compulsory period at school. At present, increasing shares of the young spend more years in education and often study much longer than is legally required. But do we find structural changes in the locational patterns of the remaining early school leavers within Belgium and its institutional regions?

As shown in the first part of this paper, there exists little systematic incongruity between the spatial distribution of the shares of university graduates among the entire adult population (chart 2) and that of the shares

of university graduates among the youngest generation in the labour market (chart 3). There are, however, clear incongruities between maps 5 and 6. The spatial structure in map 6 is not dominated by the differences between the nation's centre and its periphery. It is instead characterised by the divergence between the Flemish and the Walloon regions. Most local communities with the highest share of less-educated young adults (123 of the 147) are situated in Wallonia, while most municipalities with the lowest share (113 of the 147) are part of Flanders. The share of early school leavers in the population of adults between 25 and 34 in 2001 was 22.4% in Wallonia, and only 15.1% in Flanders. The highest value of this distribution was reached in the community of Farciennes (near Charleroi in the Walloon Region of Belgium), with 36.9% early school leavers among the young adults, and the lowest in the community of Sint-Martens-Latem (near Ghent in the Flemish Region), with only 5.5% of early school leavers between 25 and 34. The correlation with the total population number fell to 0.02 in 2001, while that with the relative population density was 0.04. There is thus no longer any significant relation to these population measures. In this regard, the early school leavers have become remarkably evenly spread out across communities. The evolution of the shares of university graduates only diverges slightly in the institutional regions of Flanders and Wallonia (see charts 1, 2 and 3). However, Flanders has done better than Wallonia in avoiding relatively high percentages of early school leavers or dropouts in its local labour markets (see charts 4, 5 and 6).

25. See EDWARD L. GLAESER & ALBERT SAIZ, "The rise of the skilled city..."

**Chart 6 : The spatial distribution of the share of 25 to 34 -year olds with only primary or lower-secondary education across the 589 municipalities of Belgium in 2001, in four equal groups**



In a knowledge-based economy, local economies are negatively affected by the presence of a proportionally higher share of less-educated or less-skilled workers (particularly among newcomers to the labour market). The findings presented here point to important structural differences within Belgium and its regions. The presence of large concentrations of unskilled or semi-skilled workers appears to be a result of economic structures, but it can also hinder the 'regeneration' of municipalities and regions<sup>26</sup>. In this way, changes in the matter of education and the economy perpetuate geographical dividing lines. More general transitions (such as the development of a knowledge economy) thus have drawn out effects – with a specific geographical

spread of opportunities and problems in each case. To close this article, the chronological development of the  $DI_L$  and  $DI_{LS}$  (the dissimilarity indexes for the lower-skilled) and the evolution at municipality-level of the percentage of lower-skilled inhabitants between 1961 and 2001 will be discussed in more detail.

The rise of the knowledge-based economy elicits various divergent effects, and brings about specific spatial distributions of chances and problems, of successes and failures. Next, we discuss the time path of the dissimilarity indexes for the less-educated adult populations in Belgium and its institutional regions between the population censuses of 1961 and 2001.

**26.** In 1961 the average degree of unemployment in Flanders was 3.0%, while that for Wallonia was only 2.0%. In 2001, in contrast, the average percentage of unemployment in Flanders was 7.7%, and for Wallonia no less than 15.1%. In Wallonia, only the German-speaking communities in the east (near the border with Germany) and the area close to the Grand Duchy of Luxembourg had relatively low unemployment rates in 2001, while many of their inhabitants found jobs on the other side of the border. On this, see ANN VERHETSEL, ISABELLE THOMAS, ETIENNE VAN HECKE & MARJAN BEELEN, *Pendel in België*, Vol. 1 : *De woon-werkverplaatsingen*, Brussel, FOD Economie, KMO, Middenstand en Energie, Algemene Directie Statistiek en Economische Informatie, 2007. High unemployment does not only have a bearing on the financial possibilities for further study, but perhaps also diminishes incentives to study further (because of the decline of the potential profits of such an investment).

**Table 2 :  $DI_p$  - values for adults with only primary schooling in Belgium and its regions, calculated at the level of the local communities, and expressed in percentages**

	<b>1961</b>	<b>1970</b>	<b>1981</b>	<b>1991</b>	<b>2001</b>
<b>Belgium</b>	18.0	15.1	10.7	10.9	8.3
<b>Flanders</b>	16.1	12.4	9.3	9.6	6.2
<b>Wallonia</b>	15.5	13.2	12.1	10.9	5.7
<b>Brussels</b>	13.6	15.8	13.4	13.4	6.6

**Table 3 :  $DI_{LS}$  - values for adults with only primary or lower-secondary schooling in Belgium and its regions, calculated at the level of the local communities, and expressed in percentages**

	<b>1961</b>	<b>1970</b>	<b>1981</b>	<b>1991</b>	<b>2001</b>
<b>Belgium</b>	19.1	18.8	14.1	11.6	10.3
<b>Flanders</b>	17.5	15.2	11.6	9.8	8.2
<b>Wallonia</b>	17.5	14.4	12.5	8.5	8.8
<b>Brussels</b>	14.5	13.9	12.3	10.9	13.6

#### **- Distribution**

The  $DI_p$  and  $DI_{LS}$  (the dissimilarity indexes for the lower-skilled) are calculated in an analogous way to the  $DI_U$ . The results are recorded in tables 2 and 3. Both display the share of less-schooled adults who would have to move to another local community in order to obtain a completely uniform mix with the other, more-schooled parts of the adult population. In table 2 ( $DI_p$ ), we present the data for the adult population with only primary schooling. In table 3 ( $DI_{LS}$ ), our focus is on the adult population with only primary or lower-secondary schooling.

The indices presented in tables 2 and 3 documents the decrease in the segregation of the less-schooled in the second half of the twentieth century. There is not only a decrease in the share of early school leavers in the adult population in Belgium; this decrease is accompanied by decreasing geographical heterogeneity. This kind of homogenization manifests itself in Belgium as a whole, as well as in the institutional regions of Wallonia and Flanders. Only in the Capital Region of Brussels is there evidence of a somewhat different trend (probably mainly as a result of



the great influx of many semi- and unskilled migrants during the last decades)<sup>27</sup>. When the findings presented in tables 2 and 3 are compared to those presented in table 1, the exclusive and elitist character of the universities can again be seen. Geographical segregation is larger and more stable for university graduates than for early school leavers and school dropouts. The remaining differences in the spatial distribution of early school leavers between the Flemish and Walloon Region are much smaller than those in the geographical distribution of university graduates. In the second half of the twentieth century, the decrease in the average share of adults with only primary or lower-secondary education has gone hand in hand with the decrease in geographical heterogeneity at the local level, but this decrease in heterogeneity has been accompanied by increasing divergence between Flanders and Wallonia.

## IV. Conclusion

In the past decades, local labour markets have become increasingly dependent on education and educational credentials. The rise of the knowledge-based economy has led to an increasing demand for highly trained and highly specialized human capital. Against this background, we have highlighted and discussed the uneven geographical distribution of educational credentials in Belgium in the second half of the twentieth century. In spite of the enormous post-war

expansion of higher education, and in spite of a broad range of public policy initiatives aimed at achieving (or improving) equality of opportunity in the course of this expansion, it is clear that the spatial segregation of university graduates has remained relatively high in this country and its institutional regions. The gap between municipalities with high-skilled and with low-skilled human capital has structural characteristics. It appears not to be simple to close this gap and to reduce the segregation of university degree-holders.

In the same period, we have observed both a decrease in the share of early school leavers and a decrease in their geographical clustering. However, these decreases go hand in hand with increasing divergences between Flanders and Wallonia. Since the last decades of the twentieth century, the Walloon region is confronted with both economic problems and a relatively high percentage of school dropouts. In the economically more prosperous region of Flanders, exclusion from education at an early age has become much less common. The opportunities for economic success in various parts of Wallonia suffer because of the presence of a comparatively high percentage of lower-skilled young people.

As this article illustrates, societal transitions are highly complex phenomena. Transitions at the level of education and the economy currently elicit divergent effects, and lead to different geographical distributions of chances and problems. In Belgium, all parts of the country

27. Among the youngest generations on the labour market, the value of the indices has again somewhat increased. For the generations between 25 and 34 years of age, whose data we have presented in map 6, the  $DI_{15}$ -value was 0.16 for Belgium, 0.11 for Flanders, 0.13 for Wallonia and 0.20 for the Capital-Region of Brussels in 2001.

do not undergo these transitions at the same time as each other or in a uniform pattern. In our view, it is important that scientists and policy makers pay more attention to the resulting spatial inequalities alike. Our overview of the conditions and consequences of the rise of the knowledge-based economy, however, also points to the difficulties that confront educational policymakers when they attempt to address such inequalities.

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### Abbreviation

NIS | Nationaal Instituut voor de Statistiek (National Institute for Statistics)