

ANALYZING THE INTENSIVE AND EXTENSIVE USE OF LABOUR FORCE IN THE TEXTILE INDUSTRY OF THE EUROPEAN UNION

AVRUPA BİRLİĞİ'NİN TEKSTİL SANAYİNDEKİ İŞGÜCÜNÜN ETKİN VE YOĞUN KULLANIMININ ANALİZ EDİLMESİ

Associate Prof. PhD Liana-Eugenia MEȘTER¹, Associate Prof. PhD Nicoleta-Georgeta BUGNAR¹

Assist. PhD Andreea-Florina FORA¹, Lecturer PhD Monica-Ariana SIM¹

Associate Prof. PhD Adriana GIURGIU¹, Lecturer PhD Marius Darius ȘUTEU²

¹*Department of International Business, University of Oradea, Faculty of Economic Sciences, Oradea*

²*Department of Textiles-Leatherwork and Industrial Management, University of Oradea, Faculty of
Energy Engineering and Industrial Management, Oradea, Romania*

Received: 03.12.2015

Accepted: 23.05.2016

ABSTRACT

The study proposes an analysis of the way in which labour was used in the textile industry in the EU during the crisis of 2008-2013. Starting from theoretical sources that show labour as factor of the economic growth, we will achieve specific analysis of the indicators reflecting the intensive and extensive use of labour force in the textile industry, the measurement and developments of the correlation between these indicators for EU economies in 2008-2013. The databases provided by Eurostat were used for the proposed analysis, data which have undergone a process of grouping according to established criteria (EU membership) in order to determine/calculate specific indicators. The results obtained and the interpretations made are based on comparisons between indicators calculated and graphical trends as well as the information resulted in the form of findings and specific assessments. The observance of the correlation between labour productivity and wages is of special importance at microeconomics level as well as for the entire national economy. An optimal correlation between labour productivity and wages implies that the dynamics of labour productivity is higher than that of the average wage. Only faster growth of labour productivity compared to that of salaries allows the reduction of the wage costs per unit of product resulting in lower costs and increased profitability.

Keywords: textile industry, labour force productivity, the average wage, correlation coefficient.

Corresponding Author: Liana-Eugenia MEȘTER e-mail: lmester@uoradea.ro

INTRODUCTION

In the current context of globalization and liberalization, Europe's textile industry has had to face unfair competition from countries of SE Asia supported by policies and state aid and the low cost of labour. The financial crisis and the rapid rise of Asian markets have imposed restriction of employment in the European textile industry in the period 2008-2014 and increased motivation for the employees who

remained in the field. The process of structural adjustment of the textile industry was accelerated so as to cope with the conditions existing in the international market by launching new products, improving subcontracting business and relocation of production. The EU textile industry transfers its activity (due to lower value added, labour intensive use and lower cost) to countries in Central and Eastern Europe and even in Asia. The support of the European business environment brings along an increase in the weight of the

textile industry in economy throughout Europe and a development of the national economic results.

After the European Commission adopted a series of recommendations to EU member at the beginning of 2013, states aimed at getting Europe out of the crisis and strengthen the foundations of economic growth (1); for most member EU the end of 2013 brought the coming out of the recession and the growth of the economic force that will feed the recovery from the crisis (2), fact supported by data and statistical calculations.

The economic growth aims to increase the results of the national economy based on a combination and use of direct factors of production. The EU textile industry is characterized by a high degree of regional concentration of production, particularly in Italy, Spain, and Portugal.

If in the late 1950s, Harrod (3) and Domar (4) tried to develop the Keynesian analysis with the elements of economic growth, after the mid-1980s, the research on this concept has experienced a boom, beginning with Romer (5) and Lucas' (6) activity. This entire research was based on analyzing factors that influence the economic growth as being more important than the mechanism of economic cycles or the effects of monetary and fiscal policies.

Most models feature the growth of the economy as a dynamic process - see the economic growth patterns Arrow (7), Intriligator (8), Ramsey (9), Shell (10).

Other models are based on the idea that an exogenous growth in useful work automatically generates economic growth. The labour factor is implemented in the model through the LINEX production function (10), (11).

Labour is an essential factor in any activity and a direct determinant of the economic growth, its action being possible by taking into account the level of other factors of production - technical factors (technology, automation, robotics, innovation etc.), social factors (working climate, work incentives, professional development opportunities, social responsibility of the company) and psychological factors to motivate labour force (possibility of improving and developing at the workplace). This study will only approach the use of labour (extensive and intensive), leaving another study to analyse the effects of the other factors of the economic growth.

In the process of economic growth, labour - in terms of quantity (number of employees) and quality (level of training and qualification) - intervenes by increasing the volume of work performed macro-economically and being evidenced by production volume and quality of work expressed synthetically by labour productivity.

MATERIAL AND METHOD

The *labour productivity* indicator developed in the textile industry in the EU has been taken into account in order to highlight the intensive use of labour in this field.

The Organization for Economic Cooperation and Development (OECD) defines it as "the ratio of a volume measure of output to a volume measure of input"(13). The intensity of labour is the *qualitative* dimensions of labour

input. If an organization uses labour much more intensely, one can assume it is due to greater labour productivity, since the output per labour-effort may be the same (14). The labour input can be biased by different methodologies used to estimate the number of employed persons (15).

Labour productivity expresses the efficiency with which labour (staff) is used and it stands for the characteristic of work to create a certain amount of use values in a unit of time and it reflects the efficiency with which an amount of labour is spent. The level of labour productivity is expressed either by quantity of products or value of products manufactured in a unit of time by an employee (the means of expressing labour productivity used in the analysis performed) or by the expense of labour which returns per unit of product. In the present study *production* (expressed in units of value) refers to the entire textile production in the EU economy per year in the period under review (2008-2015). The validity of the international comparisons of labour productivity can be limited by a number of measurement issues.

The average labour productivity (W_m) or the effectiveness with which a certain amount of work is being spent is measured either by the quantity of goods produced or their value in a unit of time (ΣQ), or the expense of labour per unit of product. The amount of labour used for the considered case is expressed by the number of employees (ΣN). Thus:

$$W_m = \Sigma Q / \Sigma N \text{ or } W_m = \Sigma N / \Sigma Q.$$

The *number of employees* indicator for the textile industry in the EU has been considered to highlight the extensive use of labour in this field, and the level of labour motivation is indicated by the annual average salary. The workforce that an economic agent/economy disposes of is evidenced by the number of employees, indicator that can be determined at a certain time or for a certain period.

The Spearman rank correlation coefficient is used to determine the link and the intensity of the relationship between the factors taken into account: labour productivity, production and number of employees in the textile industry in the EU.

$$C_s = 1 - 6 \sum d_i^2 / n(n^2 - 1),$$

where d_i is the difference between ranks, and n is the number of economies/countries.

To indicate the existence of a link between the factors considered, the value of C_s must range between -1 and 1 (the closer to 1 the value, the stronger the link).

The quantitative results obtained may contain errors, since, in some cases, the absence of statistics imposed their deduction considering the general tendency so as to ensure data compatibility.

RESULTS AND DISCUSSION

The data summarized in Table 1 and shown in Figure 1 were obtained based on the existing data and using the country grouping required for applying the proposed method, as well as by using the Spearman rank correlation coefficient.

Table 1. Spearman rank correlation coefficient (labour productivity - no. of employees - wage per employee / year) for textile industry in EU

Years	Correlated indicators	Labour productivity - wage/employee/year	Labour productivity - no. of employees	No. of employee - wage/employee/year
2008		0,95	-0,02	0,02
2009		0,97	-0,07	-0,17
2010		0,96	-0,10	-0,19
2011		0,97	0,01	-0,16
2012		0,94	-0,25	-0,18
2013		0,94	-0,08	-0,12
2014		0,94	-0,07	-0,11
2015		0,93	-0,08	-0,09

Source: made by the author based on data taken from: <http://appsso.eurostat.ec.europa.eu/nui/submitViewTableAction.do>

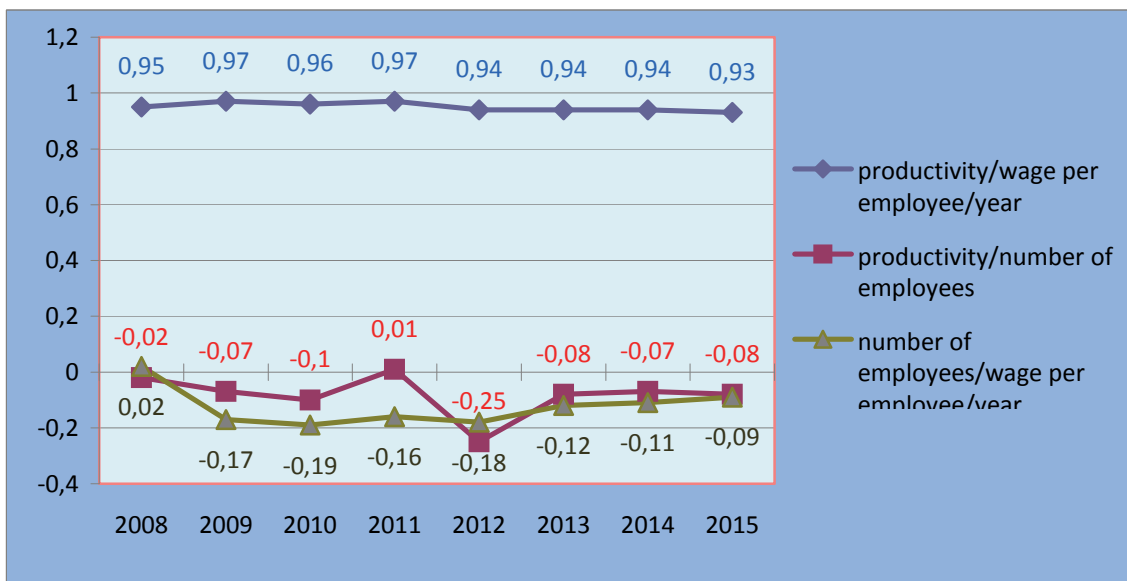


Figure 1. The evolution of Spearman ranks correlation (labour productivity – number of employees – wage per employee / year)

Considering now the results as fair, we can draw at least the following conclusions:

The entire 2008-2010 period shows a strong concordance of ranks regarding the intensive use indicator (labour productivity) and the wage per employee (the average wage), the Spearman coefficient presenting values ranging from 0.94 to 0.97 consequently close to maximum, i.e. 1, which means that the employees have a strong incentive for performance, performance that supports the labour productivity growth (table 1). It appears that towards the end of the analyzed period the correlation decreases slightly in intensity, while remaining very strong, which can be explained by the intervention of other factors that increase the labour force productivity - technical factors (specialization in certain manufacturing operations, equipment performance, robotics, high technical level etc.).

The ranks correlation regarding the average productivity and the number of employees registers normal negative values, the reverse connection between the two indicators being obvious. In time there are oscillations recorded in one

direction or another; a special case is that of the year 2011 when the value is almost nil due to structural changes of the labour force employed, problem cancelled/perceived by stakeholders (possibly managers), as in 2012 the correlation becomes normal and the strongest of all years considered.

The correlation between the number of employees and the average wage starts at a value close to zero in 2008, reflecting an inappropriate situation (lack of incentives for employees), whereas the correlation in the next 7 years is normal, on reverse, with small oscillations.

The greatest discrepancies from one year to another are recorded in the correlation between labour productivity and the number of employees, particularly in 2011.

The textile industry still plays a major role in supplying jobs and ensuring high rates of employment. The developments in the textile industry production and the number of employees in the textile industry were taken into account for a more detailed study, the percentage measurements considered being compared with the 2008 basis - Table 2 and Figure 2.

Table 2. The evolution of production value and number of employees in the textile industry in the EU (absolute and percentage values)

Years	Indicators	Production (Q) (ml. Euro)	No of employees (N) (thousands)	Percentage (2008=100%)	
				Q	N
2008		75511	891,2	100%	100%
2009		57907	716,1	77%	80%
2010		64073	650,5	85%	73%
2011		69955	662,2	93%	74%
2012		64637	645,8	86%	72%
2013		65164	626,8	85%	70%
2014		66989**	591,8***	89%	66%
2015		66520**	595,5***	88%	67%

Source: made by the author based on the data taken from the [***http://appsso.eurostat.ec.europa.eu/nui/submitViewTableAction.do](http://appsso.eurostat.ec.europa.eu/nui/submitViewTableAction.do)

*** <http://ec.europa.eu/eurostat/statistics>

*** http://euratex.eu/fileadmin/user_upload/documents/key_data/fact_and_figures_2014.pdf and [***http://appsso.eurostat.ec.europa.eu/nui/show.do](http://appsso.eurostat.ec.europa.eu/nui/show.do)

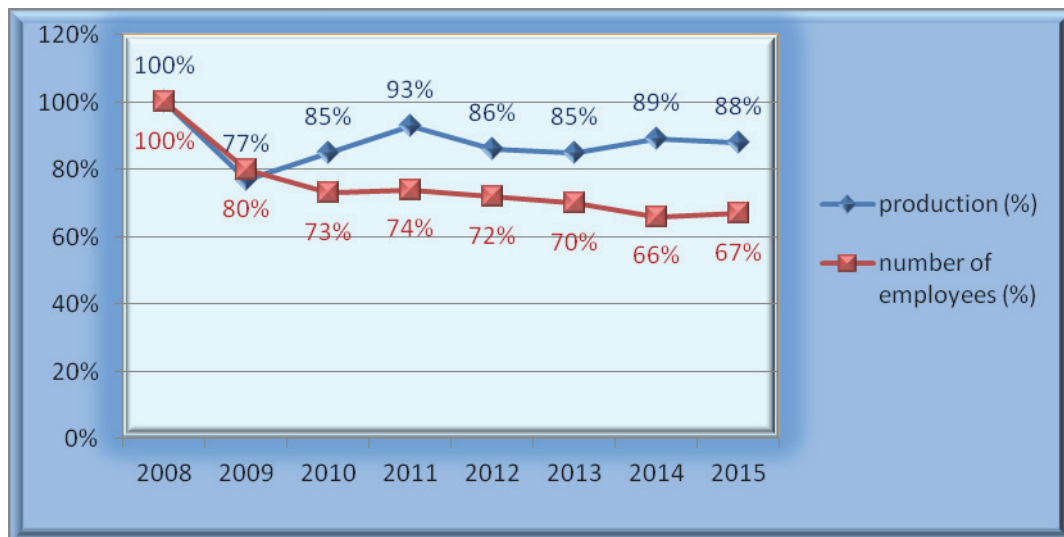


Figure 2. The evolution of production value and of number of employees in the textile industry in the EU (%)

In 2014 the average productivity grows: production increases and the number of employees decreases; in 2015 the average productivity decreases because a number of employees greater than in 2014 get a lower production due to the reduction in the average salary. As a result, it is important to get the employees interested in the growth of productivity and this might be achieved by the increase the average salary – Table 3 and Figure 3.

One researched aspect on the intensive and extensive use of labour force in the textile industry focused on one hand on the development of a specific part of production and on the other hand on the number of employees. It is found that compared to 2008 (considered a basis for comparison) both indicators decline, but the decrease is more pronounced in 2009 in terms of production, which reflects the inefficiency of the intensive use of labour force (the output is 77% of the one of 2008 and the number of employees is 80% of the number of employees registered in 2008) –relatively resulting in the decrease of the number of employees and of production. In the coming years there is an increasing

efficiency in the use of intensive labour force because the production decreases at a rate much lower than the decrease in the number of employees, but the negative trend of production decrease remains.

In countries where the weekly working regime has resulted in a lower number of hours worked, the increased production indicates a better intensive labour force use. Regarding the average number of hours worked per week, the EU average was 40 hours (full time). In the UK and Austria the employees worked 42.2 hours/week, and in Denmark 37.7 hours/week, Ireland 38.4 hours/week, the Netherlands 38.9 hours/week. In these countries, the processed data show a greater efficiency in the use of intensive labour force. Legal holidays influence the time that can be used for production; the increase in the number of holidays (hence the number of non-working days) imposes measures to streamline the labour force in point of a more intensive use either by using technical solutions or by focusing on financial incentives.

At EU level it appears that the number of non-working days is higher among the eastern countries (which also have low labour force productivity), so there is a discrepancy and inefficiency in terms of intensive and extensive use of labour force.

Further there followed the highlighting of the developments of average values of intensive usage (average productivity) and of wage as a means of labour force incentives in achieving performance in the field (Table 3 and Figure 3).

The observance of the correlation between labour productivity and wages is of special importance both at a microeconomic and macroeconomic level. At microeconomic level the positive effects of observing the analysed correlation are manifested in terms of ensuring a certain balance between production, costs and wages. At macroeconomic level, the positive effects are related to maintaining the flow of goods and money, avoiding feeding inflationary phenomena.

Table 3. The evolution of average productivity per employee and of the average wage in the textile industry in the EU (absolute and percentage values)

Years	Indicators	Average productivity (thousands euro)	Average wage (euro)	Percentage evolution (2008=100%)	
				Productivity	Wage
2008		84.73	13892,5	100%	100%
2009		80.86	15046,4	95%	108%
2010		98.50	15719,3	116%	113%
2011		105.64	16424,0	125%	118%
2012		100.09	16939,9	118%	122%
2013		103.96	15834,5	123%	114%
2014*		113,19	15472,5	134%	111%
2015*		111.70	15929,9	132%	115%

Source: made by the author based on the data taken from the [***http://appsso.eurostat.ec.europa.eu/nui/submitViewTableAction.do](http://appsso.eurostat.ec.europa.eu/nui/submitViewTableAction.do)

*** <http://ec.europa.eu/eurostat/statistics>

*** http://euratex.eu/fileadmin/user_upload/documents/key_data/fact_and_figures_2014.pdf and

*** <http://appsso.eurostat.ec.europa.eu/nui/show.do>

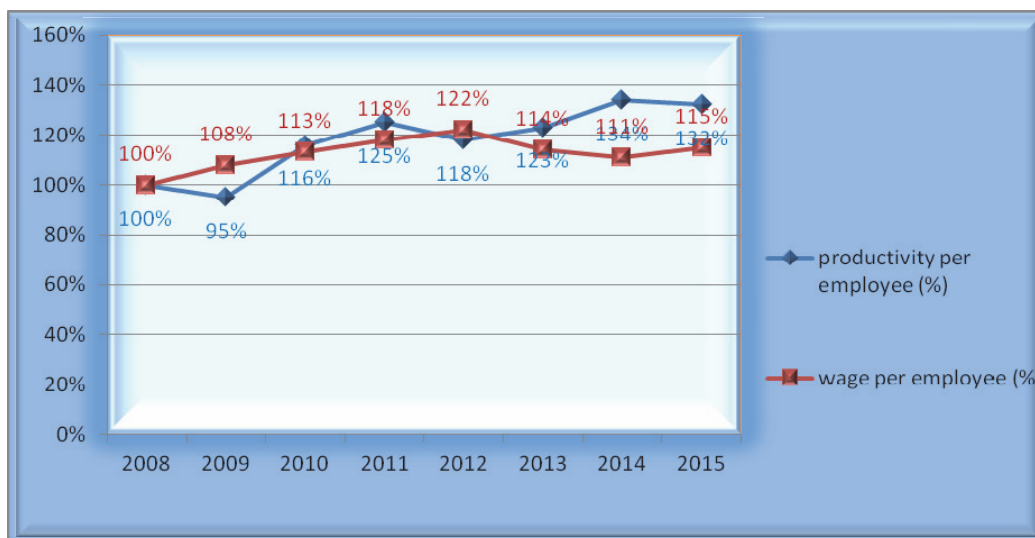


Figure 3. The evolution of the average productivity per employee and of the average wage in the textile industry in the EU (%)

Considering labour productivity as the most important indicator of intensive labour use and given that financial stimulation of employees can be a way of improving this use, the study of the correlate evolution of the average labour force productivity and of the average wage (the level of productivity was considered the one from the database used) were researched resulting in a general trend where:

- the average labour force productivity increases, with the exception of 2009 and 2012 when there is a slight decrease (resulting from structural changes of personnel, less efficient management etc.);

- the average wage records a continuous growth, less in 2013 and 2014 when it drops; the indicators considered for 2014 compared with their level in 2008-2013, indicates a slow recovery of the textile industry in the EU.

Correlating both developments, an inefficient economic situation arises because over the entire period the increase of the average wage is higher than the increase in the average productivity of labour (columns 4 and 5 of Table 3) and also there is an important discrepancy in 2009 when the average labour productivity falls by 4% compared to 2008 and the average wage increases by 8% compared to the

same year; the situation is similar in 2012. Since 2013 we can observe an annual increase of efficiency because the average productivity increases more than the average wages for the entire period 2013 – 2015.

CONCLUSIONS

Nowadays, EU economies such as France, Germany, Denmark, Netherlands, Finland, Cyprus, Slovenia, Czech Republic, Portugal, Spain and even Greece show stability in terms of the correlated evolution of indicators for intensive use (average productivity), extensive use (average number of employees) and financial reward (wage) which denotes a well-founded economic policy implemented and used in the textile industry, parallel with the financial rewarding of employees and the increased performance in the field. In other EU economies there is a demand for measures meant to stimulate the correlation between the intensive and extensive use of labour force so that the economic performance could be achieved.

The increase of the average wage automatically generates a substantial growth in costs for companies using very cheap labour force and exercises pressure on the textile industry which has always depended on the very cheap labour force. Subcontracting is common in the textile industry due to the costs involved. After a period in which the textile industry massively employed labour force due to

conditions favorable for business expansion, during the crisis the reduction in the number of employees has affected the work in this field. Salary cuts brought contracts for companies operating in this area, but it was also a hindrance to expansion (labour force productivity was affected). The textile industry has long been regarded below its potential due to a severe shortage of manpower. The European textile industry has remained competitive, partly due to innovation, many companies investing in textile products for industrial use, generally belonging to niche markets. It is believed that the activity in the textile industry will strengthen up and revive only through innovation and identification of some niche channels, along with a determined orientation towards exports.

The smart development of the textile industry in the EU in the coming period should consider a strategic reorientation by shifting the focus from high-volume based production and low value-added to innovation based production and at the same time by stimulating the development of conception/creation and design activities and the use of new fabrics. The orientation must still be on the competitive advantages and the focus must be on high-quality, innovative products with a special design, and technology involved. This could be achieved by means of a permanent adjustment to structural changes of real demand on the market and by performance management that ensures incentives to each and every employee.

REFERENCES

1. <http://europa.eu>, 29.05.2013
2. <http://www.zf.ro/zf-24>, 16.12.2013 - *Moștenirea anului 2013: Europa a scăpat de recesiune și vede limpede ieșirea din criză (...)*
3. Harrod, R.F. (1939), *An Essay in Dynamic Theory*, Economic Journal, 49, March.
4. Domar, Evsey D., (1946), *Capital Expansion, Rate of Growth and Employment*, Econometrica, 14, April.
5. Romer, P.M. (1986), *Increasing returns and long-run growth*, Journal of Political Economy 94.
6. Lucas, R. E. (1988), *On the mechanics of Economic Development*, Journal of Monetary Economics 22.
7. Arrow, Kenneth J. (1985) - *Informational Structure of the Firm*, American Economic Review, American Economic Association, vol. 75(2), May.
8. Intriligator, M. (1971) - *Mathematical optimization and economic theory*, New York: Prentice-Hall, 1765-1777.
9. Ramsey, Frank (1928) - *A Mathematical Theory of Saving*, *Economic Journal*, 38, December, 543-559.
10. Shell, Karl (1967) - *A Model of Inventive Activity and Capital Accumulation*, in Karl Shell, ed., *Essays on the Theory of Optimal Economic Growth*, 67–85. Cambridge, MA: MIT Press.
11. Ayres, R. U.; Martínás, K. (2005) - *On the reappraisal of microeconomics: economic growth and change in a material world*.
12. Ayres, R. U.; Warr, B. (2005) - *Accounting for growth: the role of physical work*. *Structural Change Economic Dynamics*, 16(2), 181-209.
13. ***, OECD Manual (2002): *Measuring Productivity; Measurement of Aggregate and Industry-Level Productivity Growth*.
14. ***, Federal Reserve Bank of Minneapolis, *The Labour Productivity Puzzle*, May 2012.
15. ***, International Labour Comparisons Program *International comparisons of manufacturing productivity and unit labour costs trends*, Bureau of Labour Statistics.
16. Chernousov, Michael, Susan E. Fleck, and John Glaser, 2009, *Productivity Trends in Business Cycles: A Visual Essay*, Monthly Labour Review, 132(6): 50–63.
17. Holman, Corey, Bobbie Joyeux, and Christopher Kask, 2008, *Labour Productivity Trends Since 2000, by Sector and Industry*, Monthly Labour Review, 131(2): 64–82.
18. <http://appsso.eurostat.ec.europa.eu/nui/submitViewTableAction.do>
19. <http://ec.europa.eu/eurostat/web/products-datasets>
20. <http://ec.europa.eu/eurostat/statistics-explained>
21. http://euratex.eu/fileadmin/user_upload/documents/key_data/fact_and_figures_2014.pdf
22. <http://appsso.eurostat.ec.europa.eu/nui/show.do>