Skills scenarios for the textiles, wearing apparel and leather products sector in the European Union

Final report

LOT 2
of
Comprehensive Analysis of Emerging Competences and Economic Activities in the European Union

undertaken for the
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Unit Working Conditions, Adaptation to Change

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Abbreviations

BERD	Business enterprise research and development
BRIC	Brasil, Russian Federation, India, China
CEDEFOP	European Centre for the Development of Vocational Training
EMCC	European Monitoring Centre of Change
EU15	Austria, Belgium, Denmark, Finland, France, Germany, Greece, Italy, Ireland, Luxembourg, Netherlands, Portugal, Spain, Sweden, United Kingdom
EU27	EU15 plus NMS countries
FDI	Foreign direct investment
IEA	International Energy Agency
NMS	New Member States: Bulgaria, Cyprus, Czech Republic, Estonia, Hungary, Latvia, Lithuania, Malta, Poland, Romania, Slovakia, Slovenia
NM10	New Member States without Bulgaria and Romania
REACH	Registration, Evaluation, Authorisation and Restriction of Chemical substances
R&D	Research and development
TCL	Textiles, clothing and leather industries

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Policy summary

European textiles, clothing and leather industries (TCL) have passed through stormy weather over the past decades: attacked by competitors from Asia and faced with heavy price competition on consumer markets, the industry was driven by globalisation. Big retailers emerged and organised global supply chains. Producers, in parallel, relocated parts of their production to low-cost countries in order to remain competitive.

The industry lost one third of production volume and jobs within a ten year period from 1996. It had to accept continuously rising import shares from low-cost countries – China in particular. The phasing out of the Agreement on Textiles and Clothing (and similar agreements in the leather sector) in 2005 gave these trends a further push. Mass-production largely disappeared from high-wage areas in the EU while low-cost areas – the New Member States, Portugal and Greece – could keep at least parts of TCL production. This was associated with significant changes of the skills profiles in the two areas.

The sector adjusted to this situation with three strategies:

- a cost oriented approach based on relocation
- and innovation oriented approach based on upgrading of products and the development of specialty textiles
- a productivity oriented approach based on automation and supply chain management

Four main drivers appear to determine the future of European TCL industries: global competition, the extension of the knowledge base, market changes, and environmental aspects. Using these drivers, three alternative scenarios were developed by this study:

- Scenario 1 called **"Globalisation limited"** sees considerable effects from climate change. Rising environmental costs will change the system of global trade and set new priorities for consumers, governments and producers. TCL industries will become more European or even regional under these conditions.
- Scenario 2 called **"Asian dominance – European excellence"** assumes that emerging countries will improve their specialisation in industrial manufacturing and the EU will strengthen its technological lead. Production activities will largely disappear from European TCL industries but a great need for technical specialists and natural scientists will emerge.
- Scenario 3 called **"Advanced New Member States"** describes how the European Union and low-cost countries among the Member States are going to defend the industrial basis in Europe. Facing the strongly negative effects of globalisation on manufacturing employment (and TCL employment in particular), a comprehensive policy programme aims to revive industrial jobs.

All three scenarios result in a further decline of employment. However, the "Advanced New Member States" scenario shows returns in terms of the number of jobs by the end of the scenario horizon.

The study recommends

- *Developing the knowledge base:* Facing the situation of an eroding training system, it is recommended to apply a strongly selective HR policy concentrated on the regional centres of TCL production in Europe.
- *Fostering innovation strategies:* Innovation will be a precondition for the survival of European TCL industries, particularly in the areas of specialty textiles, machinery production, and logistic systems. An interdisciplinary approach should be promoted rather than segmented specialisation.
- *Strengthening regional policies:* TCL industries in Europe need a strategy to defend the share in mass consumption markets. The New Member States are those which would be best positioned to compete with the Asian competitors. The development of regional TCL clusters – as was undertaken by China – might, therefore, help to improve the competitiveness of European mass producers. This requires a low-cost strategy supported by trade unions and workers, a human-capital strategy developing regional labour markets, an efficient organisation of the business environment, and a marketing strategy expanding the sales networks worldwide.

Résumé

Les industries européennes du textile-habillement-cuir (THC) ont traversé des décennies difficiles : soumis à la concurrence de l'Asie et confronté sur les marchés de masse à une sévère compétition par les prix, le secteur a été bousculé par la globalisation. Les gros distributeurs qui se sont développés ont organisé leurs chaînes d'approvisionnement à l'échelle du monde. Parallèlement, les industriels ont délocalisé une partie de leurs productions dans les pays à bas coûts de main d'œuvre afin de conserver leur compétitivité.

En dix ans (1996-2006), le secteur a perdu un tiers de production en volume et un tiers des emplois. La part des importations venant des pays à bas salaires, la Chine en particulier, a augmenté de manière continue. La fin des Accords « multi-fibres » en 2005 a accéléré cette tendance. La production de masse s'est déplacée des pays à coûts de main d'œuvre élevés vers les Nouveaux Etats membres, le Portugal et la Grèce qui conservent la part la plus importe de la production européenne dans le secteur THC. Dans le même temps des changements importants se sont produits dans les profils de compétences à l'Ouest de l'Europe comme à l'Est.

En réaction à cette situation, le secteur a adopté trois stratégies différentes :

- Compétitivité par les coûts en délocalisant
- Compétitivité par l'innovation en augmentant la qualité des produits et en développant des spécialités de textiles techniques
- Une approche par la productivité, l'automatisation et la gestion de la chaîne d'approvisionnement.

Quatre facteurs principaux déterminent le futur de l'industrie THC: la globalisation de la concurrence, le développement scientifique et technologique, les évolutions du marché et les aspects environnementaux. En s'appuyant sur ces déterminants, trois scénarios alternatifs ont été construits :

- Le scénario n°1 appelé **« Globalisation maîtrisée »** intègre les effets considérables du changement climatique. L'augmentation des coûts dus aux normes environnementales change les conditions du commerce international et implique de nouvelles priorités pour les consommateurs, les gouvernements et les industriels. Dans ce cas, le secteur textile-habillement-cuir redevient plus européen, voire même plus régional.
- Le scénario n° 2 appelé **« Domination asiatique/Excellence européenne »** affirme que les pays émergents vont améliorer leur spécialisation manufacturière tandis que l'Europe confirmera son leadership technologique. Les activités de production vont disparaître en Europe mais de nouveaux besoins de spécialistes techniques et de scientifiques dans le domaine des matières vont émerger.
- Le scénario n°3 appelé « **Les nouveaux Etats Membres leaders »** décrit comment l'Union Européenne, en s'appuyant sur les pays à coût de production moins élevés peut défendre sa base industrielle. Face aux effets négatifs de la globalisation sur l'industrie manufacturière (et le secteur textile-habillement-cuir en particulier), un programme d'ampleur peut renouveler les emplois de ce secteur.

Les trois scénarios devraient voir dans les années à venir une diminution de l'emploi. Cependant le troisième scénario montre un retournement possible de cette tendance en fin de période.

L'étude recommande :

- Le développement de la base scientifique et technologique du secteur: alors que son système d'éducation et de formation se réduit, il est important de mettre en oeuvre une politique exigeante de développement des ressources humaines dans les régions de production THC en Europe.
- La recherche de stratégies basées sur l'innovation : c'est la condition de survie d'une industrie dans ce secteur, en particulier dans les spécialités textiles, les textiles techniques, les machines-outils et la logistique adaptée au secteur. Une approche interdisciplinaire pourrait favoriser ces développements.
- Le renforcement des politiques régionales : l'industrie THC exige la défense des parts de marchés sur les produits de masse. Les Nouveaux Etats Membres sont bien placés pour concurrencer les pays asiatiques. Le développement de clusters locaux – comme en Chine -, peut améliorer la compétitivité des industriels européens. Ceci demande une stratégie de maîtrise des coûts acceptée par les organisations syndicales et les salariés, une stratégie de développement de marchés locaux du travail basés sur la compétence, une organisation efficace des environnements locaux et un développement du marketing et des ventes en lien avec les distributeurs dans le monde.

Kurzfassung

Die europäische Textil-, Bekleidungs- und Lederindustrie (TCL) hat in den letzten Jahrzehnten stürmische Zeiten erlebt: Unter dem Druck der asiatischen Wettbewerber und des starken Preiswettbewerbs auf den Konsummärkten bestimmte die Globalisierung das Geschehen. Große Handelshäuser entstanden und bauten globale Wertschöpfungsketten auf. Gleichzeitig verlagerten die Produzenten Teile ihre Produktion in Niedriglohnländer um wettbewerbsfähig zu bleiben.

Der Sektor regierte mit drei Strategien auf diese Situation:
- Ein kostenorientierter Ansatz verbunden mit Produktionsverlagerungen
- Ein innovationsorientierter Ansatz mit Produktinnovationen (Spezialtextilien)
- Ein produktivitätsorientierter Ansatz mit Automatisierung und Optimierung der Wertschöpfungsketten

Die Industrie hat innerhalb von zehn Jahren seit 1996 ein Drittel ihrer Produktion und ihrer Beschäftigung verloren. Sie musste ständig steigende Importanteile aus Niedriglohnländern – insbesondere China – akzeptieren. Das Auslaufen des Abkommens über Textilien und Bekleidung im Jahr 2005 (und ähnlicher Regelungen im Ledersektor) haben diesen Trend noch mal deutlich verstärkt. Aus den Hochlohnländern der EU ist die Massenproduktion größtenteils verschwunden, während sich Niedriglohnländer – die neuen Mitgliedstaaten, Portugal und Griechenland – zumindest Teile der Produktion sichern konnten. Dies war mit erheblichen Änderungen der Qualifikationsanforderungen in diesen beiden Regionen verbunden.

Die vier Faktoren, die die Zukunft der TCL Industrie bestimmen sind globaler Wettbewerb, der Ausbau der Wissensbasis, Veränderung der Märkte und Umweltaspekte. Anhand dieser Komponenten wurden in diesem Bericht drei Szenarien entwickelt:
- Szenario 1 **„Grenzen der Globalisierung“** geht von erheblichen Effekten durch den Klimawandel aus. Steigende Umweltkosten werden das globale Handelssystem verändern und neue Prioritäten für Konsumenten, Regierungen und Produzenten setzen. Die TCL Industrien werden unter diesen Umständen wieder europäischer oder gar regionaler.
- Szenario 2 **„Asiatische Dominanz – Europäische Excellenz“** nimmt an, dass die Schwellenländer ihre Spezialisierung in der industriellen Fertigung verbessern und gleichzeitig die EU-Länder ihre technologische Führungsrolle ausbauen werden. Die Produktion an sich wird größtenteils aus Europa verschwinden. Allerdings entsteht ein starker Bedarf an technischen Spezialisten und Naturwissenschaftlern.
- Szenario 3 **„Führungsrolle für die neuen Mitgliedstaaten“** beschreibt wie die Niedriglohnländer der Europäischen Union die industrielle Basis in Europa verteidigen könnten. Angesichts der starken negativen Effekte der Globalisierung auf die Beschäftigung, wird ein umfangreiches Politikprogramm aufgelegt werden um industrielle Jobs wettbewerbsfähig zu machen.

Alle drei Szenarien resultieren in einem weiteren Rückgang der Beschäftigung. Allerdings zeigt das Szenario „Führungsrolle für die neuen Mitgliedstaaten“ gegen Ende des Szenario-Zeitraums einen Anstieg der Beschäftigung.

Die Studie empfiehlt:
- *Entwicklung der Wissensbasis*: Angesichts eines geschwächten Ausbildungssystems wird empfohlen eine stark selektive Investitionspolitik im Bildungsbereich zu verfolgen, die sich auf regionale Zentren der TCL Produktion in Europa konzentriert.
- *Innovationsstrategien fördern:* Innovation wird eine Voraussetzung für das Überleben der Europäischen TCL Industrien sein, besonders in Bereichen von Spezialtextilien, maschineller Ausrüstung und logistischen Systemen. Ein interdisziplinärer Ansatz sollte verfolgt werden, anstelle von segmentierter Spezialisierung.
- *Stärkung der Regionalpolitik:* Die europäische TCL Industrie muss ihre Kräfte in regionalen Clustern bündeln, um ihren Anteil in Massenkonsum-Märkten zu verteidigen. Die neuen Mitgliedstaaten wären am besten positioniert, um mit asiatischen Wettbewerbern zu konkurrieren. Dies benötigt eine Niedrigkostenstrategie, die von Gewerkschaften und Arbeitnehmern unterstützt wird, eine Humankapitalstrategie, um regionale Arbeitsmärkte zu entwickeln, eine effiziente Organisation des betrieblichen Umfelds und eine Marketingstrategie, um weltweite Handelsnetze zu vergrößern.

Executive Summary

General findings

European TCL industries have passed through stormy weather over the past decades[1]: attacked by competitors from Asia and faced with heavy price competition on consumer markets, the industry was driven by globalisation – and used it as a sheet anchor at the same time. Big retailers emerged and organised global supply chains. Producers, in parallel, relocated parts of their production to low-cost countries in order to remain competitive. This was boosted by huge wage differentials on global labour markets and high profits from trade. Production could only sustain in low-cost areas of the European Union and in specialised high-quality market segments. Significant restructuring was needed to transform the industry into competitive producer networks, as was the case in Italy and France.

The industry, nevertheless, lost one third of both production volume and jobs within a ten year period from 1996. It had to accept continuously rising import shares from low-cost countries – China in particular. The phasing out of the Agreement on Textiles and Clothing (and agreements in the leather sector) in 2005 gave these trends a further push. Mass-production largely disappeared from high-wage areas in the EU while low-cost areas – the New Member States, Portugal and Greece – could keep at least parts of TCL production.

In 2006 the TCL industry employed 3 million workers. In spite of slowly growing demand, low productivity and strong international competition, those firms which remained on the markets achieved profit rates comparable to other small-sized sectors. Also with the help of low wages, firms were able to survive and to perform economically well. This must also be attributed to the entry of the New Member States (NMS), Romania and Bulgaria in particular.

The industry developed three main strategies to meet competitive pressure:

- A *cost-oriented approach* which used relocation to low-cost countries, including the NMS, as its major instrument
- An *innovation-oriented approach* diversifying the spectrum towards high-quality and specialty textiles products
- A *productivity-oriented approach* based on automation and IT-based supply chain management, which helped to increase flexibility and create global sourcing systems.

The three strategies contributed to the dichotomic change of skills structures in the EU: a sharp decline in the number of textiles and clothing trades' workers and machine operating functions in high-cost areas, and the increase of such jobs in low-cost areas, the NMS in particular. The restructuring activities towards supply chain management and sales required more technical and business professionals in high-cost areas, while these functions declined in low-cost areas. This process indicates the expansion of management and marketing activities in one part of the EU and rising economic dependency in the other.

As cost-oriented strategies were not sufficient to stop the downward trend of TCL industries, the innovation-oriented approach seems to have become more and more important. Latest data from innovation surveys and other sources indicate that the TCL sector strengthened research and development broadly and now ranks at least at an average level of European manufacturing. Major efforts were undertaken in the area of technical (or functional) textiles, quality improvements, product and market diversification, production flexibility, and cost reduction. The textiles industry in particular developed new textile appliances which are used in construction, medicine, or engineering. These specialty textiles are equipped with electronic components, coated with new materials, and used for packaging, filtration, or for construction and mechanical engineering purposes. The use of these textile appliances is seen as the best escape from apparently tight consumer markets.

[1] TCL is the acronym for the NACE sectors 17 to 19: manufacture of textiles, wearing apparel, leather, leather products and footwear.

Based on a series of interviews and analyses of available research, the study achieved deep insights into the mechanisms of the sector and the rationale of actors. Strong links were detected between the different parts of the value chain, combining a sector with wide functional and regional disparities.

Main characteristics of TCL industries

Economic performance

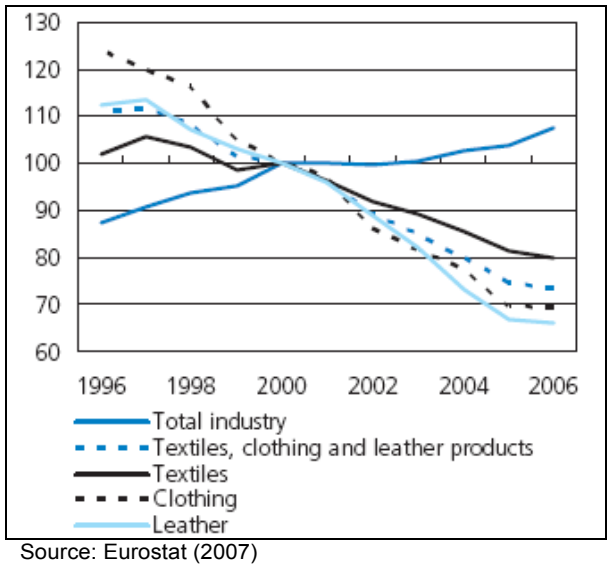
Measured by value added, the majority of the industry comes from textiles manufacturing which contributed to 47% in 2004. Clothing had a share of 35%, leather and footwear produced 18%. Regarding employment, the structure is reversed: the clothing sector provides 46% of jobs, textiles 36%, leather and footwear 18%. This indicates strong productivity differentials between the sub-sectors.

Italy is the principal manufacturer of textiles, clothes and leather products in Europe. It contributed to one third of the EU27 value added in 2006, followed by Germany and France, both with a share of 11%, and Spain and the United Kingdom both with a share of 9%. Among the countries specialised in TCL production, Malta, Bulgaria, Portugal, Romania, Lithuania, Estonia and Italy all had shares of 10% and above in total manufacturing employment. The EU27 average was 3.6%.

TCL industries experienced a rapid decline of output and prices for ten years since 1996. Overall production shrunk at a rate of 4% annually, which meant a loss of one third of the production volume during this period. The textiles industry performed much better than the other two sub-sectors. Production volumes declined by 22% from 1996 to 2006, while clothing lost 45% and leather 32%.

Private consumption has increased by 3.2% annually since 2000, mainly in the New Member States. The share of clothes in total EU consumption, however, decreased from 5.2% in 2000 to 4.7% in 2006.

EU 27 production index, 2000 = 100



Source: Eurostat (2007)

Prices also increased much slower than manufacturing prices in total. While domestic output prices of manufacturing products increased by 25% between 1996 and 2006, textiles, clothes and leather products saw an increase of 8%. This means a relative decline of output prices of 13% during that period.

Extra EU trade of the European TCL industry is characterised by high deficits. In 2007, the trade deficit was around 52.2 billion euros. Deficits appear in most of the sub-sectors (except leather production), but are particularly big in clothing. China, meanwhile, has a share of 33% of EU27 textiles and clothing imports, and – most importantly – its share in footwear rose to 40% in 2006. In physical terms, meaning the number of shoe pairs, it increased even stronger to 65%. Import prices for clothes declined by 23% and by 6% for textiles in the period from 2000 to 2006.

Nevertheless, intra-EU trade still dominates the trade flows of the EU27 Member States: almost three quarters (71.9%) of the total intra and extra EU-exports are intra trade flows. This share is higher than for intra EU trade of industrial goods.

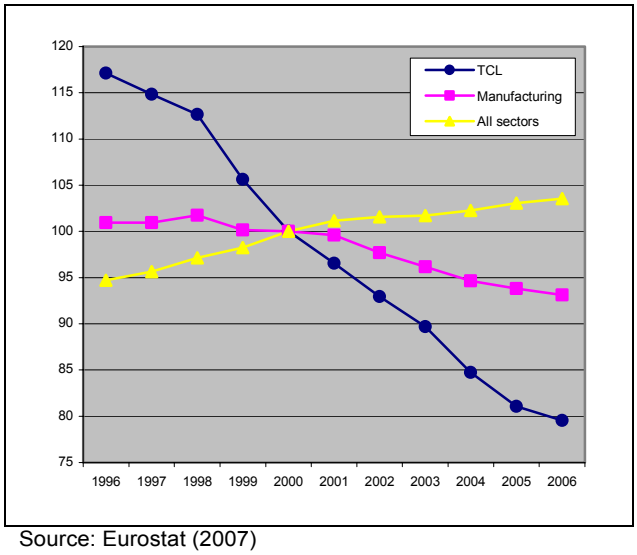
Several Member States achieved a trade surplus in 2006. Italy is the strongest among them with a positive export import balance for textiles, clothing and leather products of 16 billion euros. This,

however, has been progressively narrowing in recent years due to the decline of exports to non-EU countries.

Employment

In terms of employment, TCL industries have been declining industries for a long time. Since 1996, TCL lost one third of its jobs within ten years. Compared to overall manufacturing, the decline was at a significantly higher speed and seems to be continuing indefensibly.

EU 27 employment index, 2000 = 100



Source: Eurostat (2007)

The biggest employers were Italy with 620,000 TCL jobs, Romania had 440,000 jobs, and Poland, Portugal, Spain and Bulgaria were all between 200,000 and 300,000 jobs. Apart from Bulgaria, none of the EU countries were able to increase the number of jobs during the period 2000-2006. Ireland, UK, Cyprus and Denmark were among the countries with the most severe reductions.

Traditionally, textiles, clothing and leather are industries with high shares of females, not only in services and administration but also in production activities. This did not change between 2000 and 2006: 59.2% of all persons employed in TCL in the EU15 region in 2006 were female– slightly less than in the year 2000 (61.3%). The share of females in NM10 was even higher, and increased from 77.7% to 80.4%. Compared to the manufacturing sector, the shares of females were more than double in both regions.

In EU15 countries, TCL is an ageing sector. A clear shift from the 15-39 age groups to older workers occurred during 2000-2006. Younger workers lost 9.4 percentage points while the 40-49 and 50+ groups won 4 to 5 percentage points. In the NM10 countries, the middle age group (40-49) lost around 4 percentage points while the younger and the older attained about 2 percentage points.

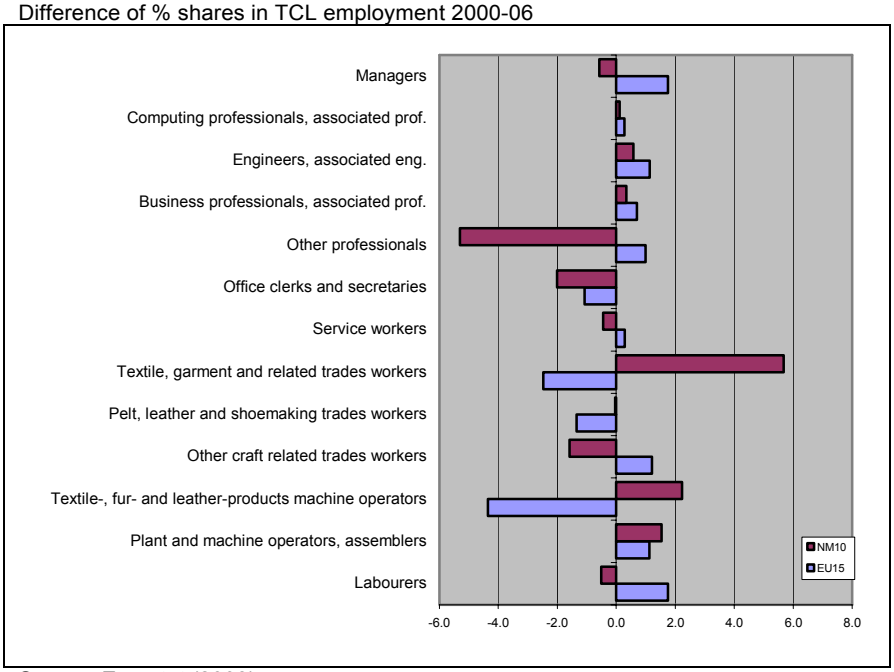
Occupations and formal education

The change of occupational structures in the TCL industries reveals clear trends in the period 2000-2006: the share of managers and professionals increased in the EU15 countries, while production related occupations decreased together with service and administrative work. Skilled production work was reduced in particular. In contrast, the New Member States extended the number of jobs for skilled production workers and assemblers, while the share of managers, other professionals, and service and administrative workers was cut.

This is the continuation of a long-lasting pattern of occupational change which is caused by the specialisation of high-wage countries on know-how-intensive activities, while standardised production is shifted to low-wage countries. The dominance of this pattern is shown by the fact that all three sub-sectors follow the same type of occupational change. It is most expressed in the clothing industry, where management and professional occupations in the EU15 gained even more than in the other two industries, while the share of unskilled production work increased strongly in the NMS.

A high share of TCL workers in EU15 countries (57.6%) only have a basic formal education (ISCED 1, 2), one third have a medium level (ISCED 3, 4), and 9.3% have a higher education (ISCED 5, 6). In contrast to the NM10 countries, the majority of workers have a medium level of education (81.1%), and only 13.1% have a low level. 5.8% attained a high level. These profiles reflect the different structures of education and training systems in the EU countries, with a strong training orientation in the former socialist countries. Moreover, the workforce in the NMS is younger and well educated in comparison to the Old Member States.

Occupational skills structure
Difference of % shares in TCL employment 2000-06



Source: Eurostat (2008)

Innovation and organisation of the value chain

European TCL enterprises of today seem to be as "innovative" and "R&D-engaged" as manufacturing enterprises in general. This is surprising considering the usual ranking of innovative sectors, and means that the transition of the European TCL industries towards a knowledge-based industry is already underway. Around 35%-50% of TCL enterprises are engaged in product and process innovation.

The transition of occupational structures is fostered by the emergence of big retail distributors – like H&M, Zara or Cortefiel – and the development of global brands – like Luis Vuitton, Armani. Based on global sourcing, these companies took advantage of the international labour division and wage differentials while distribution was concentrated under a single brand. The control over the value chain remained with the global retailers, as did the design, quality control, and marketing. Production activities, however, were developed in low-cost countries. This was accompanied by the use of "trend scouts" to detect the most recent preferences of consumers, the shortening of the "time to market" with frequent changes of fashion patterns, and the establishment of real-time IT networks to observe both sales and production.

Global retailers have a strong impact on value chains as they keep control of all strategic functions while sub-contracting production. Even high-value brands are produced in low-wage countries under the strict control of the leading companies. Products are developed in these companies and pre-collections are produced, materials are ordered and transferred to producers. Production in the sub-contracting firms is controlled by engineers and production specialists in order to guarantee quality standards. Finally, marketing strategies are designed in the headquarters and products are sold in company-related sales chains. The change of occupational structures clearly reflects this organisation of value chains.

A series of TCL producers transformed into brand-based companies, engaged in trading rather than production. The process can be explained by price structures on textiles and clothing markets which are characterised by a dominant share for wholesale and retail trade and minor shares for production. Trade appears to be the profitable activity compared to internationally competitive production.

Main drivers of change

Starting with a long list of potential drivers the study selected four areas which can be expected to have strong impacts on the development of European TCL industries:

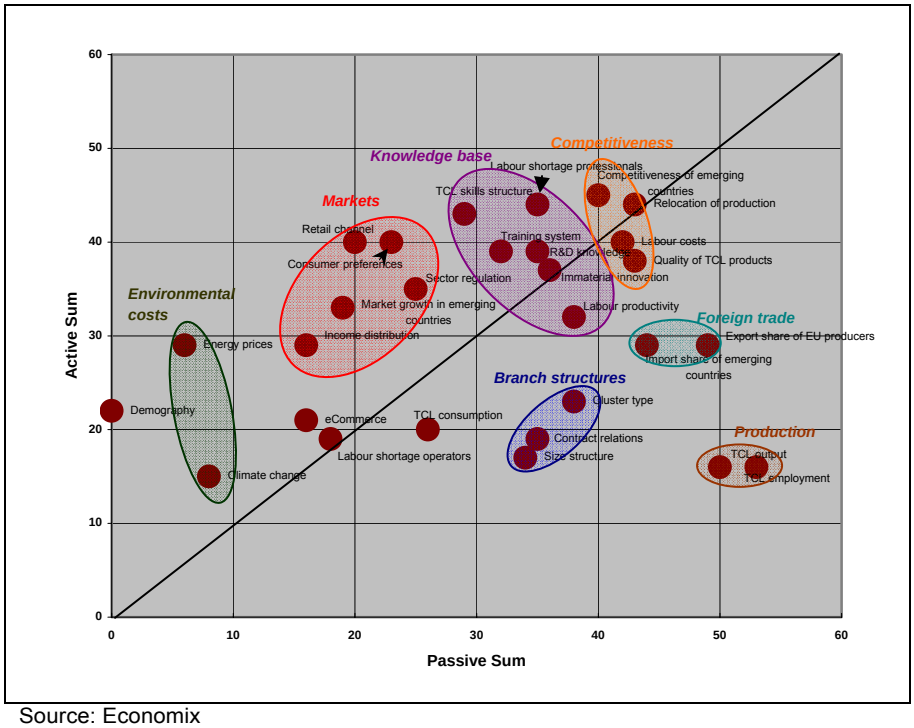
Global competition

Strongly rising competitiveness of Asian countries (China in particular) is a major threat to the European TCL sector. As Asian countries are developing the sector efficiently, the NMS are in more of a defensive than a leading position.

Knowledge base

New textiles for application in construction, medical technologies and other areas are currently being developed. "Technical" and "intelligent" textiles are the growth markets with a strong potential to substitute other materials. The sector, however, is characterised by wide-spread skills shortages due to its weak position on labour markets.

Main drivers



Source: Economix

Markets

Consumer markets are strongly price-sensitive, a driver which enforces global competition and increases the importance of global distribution chains. "Time to market" is becoming a key competitive factor. International brands emerge fostering the disappearance of regional fashion.

Environmental costs

Energy prices and the costs of climate change are going to affect the world economy in a way which is not fully visible yet. Textiles and leather production have to re-assess the chemicals used for production (REACH), clothing and footwear are reorganising their logistic systems due to rising energy prices, and all industries meet consumers who are increasingly aware of the environmental and social effects of production.

Strengths and weaknesses of European TCL industries

Due to the different position of companies in high-cost and low-cost areas of the EU, the analysis of strengths and weaknesses results in scattered picture:

Strengths and weaknesses – opportunities and threats

	Strengths	Weaknesses

High-cost areas (1)	• Leading in fashion design and branding • Strong position in top market segments • Good position in specialty textiles • Value chain management • Efficient production networks • Innovative machinery industries • Experienced labour force • Functioning training institutions	• Weak cost position • Weak position in mass markets • Weak attractiveness for young people • Declining training participation • Experience in manufacturing processes is weakening
Low-cost areas (2)	• Competitive wages • Experienced labour force • Proximity to large consumer markets • (partly) new capital stock	• Large-scale production • Weak market position • Weak innovative culture and few brands • Lack of highly skilled professionals (designers, engineers) • Few training institutions • High transport cost
	Opportunities	**Threats**
High-cost areas (1)	• Increasing demand for specialty textiles • Rising worldwide demand for high-level products • Preferences for European fashion style • Strong attendance to environmental issues	• Closing-up of emerging countries in high-value products and specialty textiles • Rising productivity in emerging countries • High price sensitivity of consumers • Disappearance of textiles and clothing machinery producers • Closure of training institutions
Low-cost areas (2)	• Europeanisation of demand • Short-distance transportation • Cost advantages compared to high-cost areas	• Rising cost advantages of emerging countries • Skills shortages due to low attractiveness of the sector • Relocation of production
(1) AT, BE, DK, ES, FI, FR, GE, IE, IT, LU, NL, SE, UK (2) BG, CZ, CY, EE, GR, LT, HU, MT, PO, PT, RO, SL, SV		

Source: Economix

- *High-cost countries* have achieved a leading position in fashion design and branding, produce high-level qualities, and are innovative. They are managing value chains and dispose of efficient production networks, machinery producers and a skilled labour force. However, they have a weak cost position – on mass markets in particular – and the skills basis is eroding.
  They can profit from their strong market position in specialty textiles and high-quality products. Moreover, their attendance to environmental aspects appears as an opportunity. However, these markets only provide limited volumes and their position will not remain unchallenged by the (Asian) competitors.
- *Low-cost countries* have competitive wages and an experienced labour force, and they profit from the proximity to large consumer markets. These advantages are reduced by the weak market position of producers and the weak innovative culture, the lack of skilled professionals and high transport costs.
  The opportunities for producers in these countries lie in short-distance transportation which may be fostered by the Europeanisation of demand and cost advantages. However, their cost position is attacked by the emerging countries. Without a clear strategy how to develop TCL industries in these countries, relocation of production might further erode the industrial basis.

Emerging competences

Competence profiles in the European Union are determined by a series of interfering trends, and they appear to be different between high-cost and low-cost areas. Skills developments in TCL industries are dominated by

- Technology and application oriented engineering in specialty textiles
- The rising importance of marketing and sales
- Value chain management on global TCL markets
- Relocation of machine operating and assembling functions

- Rising importance of environmental aspects

Emerging competences

		Textiles	Clothing	Leather
High cost area(1)	**Marketing, sales**	Technology-oriented International High-standard client services	Brand oriented Individualised Rapid change	Brand oriented Quality oriented Ecology oriented
	Engineering, production, logistics	Small batches Flexible production Strong customer orientation Sound understanding of processes and quality requirements	Organisation of value chain Supervision and control International Small batches High quality production	High quality production Small batches Craft oriented Environmental protection
	R&D, Design	Interdisciplinary research Application oriented Cross-border thinking	Rapid fashion Customisation of garments High quality fashion	Reduction of water consumption Substances with low pollution
	Management	Change management Technological leadership Quality oriented	Sales oriented Brand oriented Value chain management	Brand oriented Flexible
Low cost area(2)	**Marketing, sales**	Rapid delivery Price oriented	Value chain oriented Price oriented domestic markets important	Rapid delivery Price oriented
	Engineering, production, logistics	Efficiency oriented Large scale production Standardiised production	Efficiency oriented Large scale production Standardiised production	Efficiency oriented Large scale production Standardised production
	R&D, Design	Process innovation	Process innovation	Low importance
	Management	Efficiency and price oriented	Efficiency and price oriented	Efficiency and price oriented

(1) AT, BE, DK, ES, FI, FR, GE, IE, IT, LU, NL, SE, UK
(2) BG, CZ, CY, EE, GR, LT, HU, MT, PO, PT, RO, SL, SV

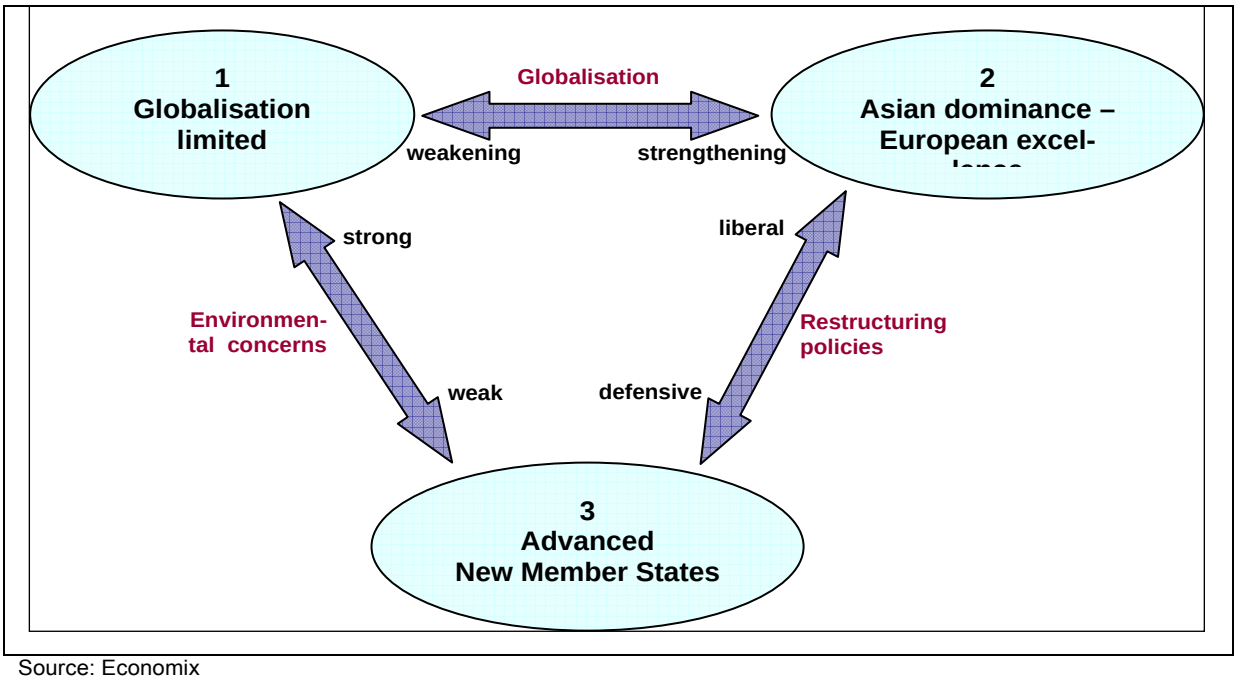
Source: Economix

Three scenarios up to 2020

The future of European TCL industries is far from being decided. The three scenarios show considerable scope for variation and various policy options:

- Scenario 1 called **"Globalisation limited"** sees considerable effects from climate change. Rising environmental costs will change the system of global trade and set new priorities for consumers, governments and producers. TCL industries will become more European or even regional under these conditions. Relocated production facilities will once again be relocated back to Europe. Even with continuing technical advances, skill needs will shift towards production and craft-related competences rather than to professionals.
- Scenario 2 called **"Asian dominance – European excellence"** assumes present trends to be reinforced. While environmental problems will be actively addressed, emerging countries will improve their specialisation in industrial manufacturing and the EU will strengthen its technological lead. Production activities will largely disappear from European TCL industries but a great need for technical specialists and natural scientists will emerge.
- Scenario 3 called **"Advanced New Member States"** describes how the European Union and low-cost countries among the Member States are going to defend the industrial basis in Europe. Facing the strongly negative effects of globalisation on manufacturing employment (not only TCL employment), a comprehensive policy programme aims to revive industrial jobs, which will reinforce the segmentation of skills needs in Europe: strong demand for production-related skills in low-cost countries and professionals in high-cost countries.

Scenarios and drivers



Source: Economix

Main characteristics of scenarios

Driver	Scenario 1 **Globalisation limited**	Scenario 2 **Asian dominance – European excellence**	Scenario 3 **Advanced New Member States**
Environmental costs	Rising significantly; Climate risks are strongly visible; Environmental policies with limited efficiency;	Rising; Environmental policies are effective; Climate risks remain manageable;	Rising; Environmental policies are effective; Climate risks remain manageable;
Markets	Consumers strongly concerned about climate risks; Global economy disintegrates due to environmental conflicts; Slow macro-growth;	Consumers appreciate environmental politics; Global market for top qualities; Global labour division is developed further; Strong macro-growth;	Consumers prefer job creation and remain price-sensitive; Medium macro-growth;
Knowledge base	Innovation concentrated on ecological technologies; Revival of traditional crafts; Switch from labour productivity to energy productivity;	Strong product innovation for specialty textiles; Design, marketing and sales very important; Management of the value chain;	Mainly process innovation provided by machinery and organisational changes; Strong increase of labour productivity;
Competitiveness	Declining competitiveness of emerging countries due to high environmental costs; Ecological and social criteria have strong impact on competitiveness;	Strong position of emerging countries in low and medium quality segments; Strong position of European producers on high value markets and specialty textiles;	Strong position of low-cost areas in Europe in medium quality segments; Strong position of high-cost areas on high value markets and specialty textiles;
Branch structures	Locally concentrated value chains due to high transport costs; Small-sized production networks; Rising share of craft business;	Closure of mass production; Small-sized innovative companies; Global networks of producers; Highly specialised crafts businesses;	Mass production remains in European low-cost areas; Switch from sub-contractors to independent suppliers: Top quality and international brands in high-cost areas;
Foreign trade	Low growth of world trade;	Strong growth of world trade;	Medium growth of world trade;

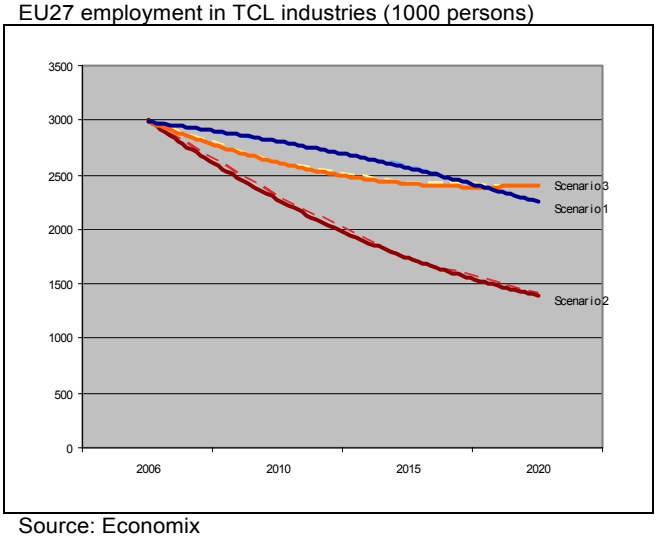
Source: Economix

Global impact on employment

The scenarios result in different employment trends. According to the "Asian dominance – European excellence" scenario, a job loss of 50% is to be expected by 2020 due to the rising competitive strength of emerging countries and increasing specialisation in Europe. The "Globalisation limited" scenario and the "Advanced New Member States" scenario are less pessimistic in terms of job reduction, assuming that 20%-25% of jobs will be lost. The "Globalisation limited" scenario profits from the return of production to Europe, but suffers from low growth of the world economy. The "Advanced New Member States" scenario is based on a successful development strategy in the New Member States and other low cost areas which shows returns by the end of the scenario horizon.

Employment trends

EU27 employment in TCL industries (1000 persons)



Source: Economix

Implications for competences and occupational profiles

The change of occupational structures shows diverse patterns. The "Globalisation limited" scenario brings a considerable shift towards production-related activities due to the strengthening of local and regional clusters in Europe. The "Asian dominance – European excellence" scenario

reinforces the need for technical and commercial professionals but reduces the demand for production-related work – except highly specialised craftsmen. The "Advanced New Member States" scenario raises the demand for specialists due to the dynamics in the New Member States.

Competence profiles are different for all scenarios. The "Globalisation limited" scenario will ask for ecological competences in all occupations but will also foster demand for technical competences. Traditional crafts techniques will be revitalised. The "Asian dominance – European excellence" scenario will mainly ask for professionals employed by trading sectors and the application of advanced textiles technologies. The demand for production-related intermediary skills will decline rapidly, except for some specialists in top quality products. The "Advanced New Member States" scenario will require the expansion of business-related competences in these countries in order to build independently operating companies and develop marketing and sales.

Occupational change
Change of relative employment shares; EU27

Occupation	Scenario		
	1	2	3
Managers	+	+	+
Computing professionals, associated prof.	+	++	++
Engineers, associated engineers	+	++	++
Business professionals, associated prof.	–	+	+
Other professionals	– –	=	+
Office clerks and secretaries	– –	=	+
Service and sales workers	=	+	++
Textile, garment and related trades workers	++	– –	– –
Pelt, leather and shoemaking trades workers	++	– –	– –
Other craft related trades workers	+	+	– –
Textile, fur and leather products machine operators	=	– –	– –
Plant and machine operators, assemblers	–	– –	–
Labourers	–	=	–
++ strong increase, + increase, = no change – – strong decrease, – decrease			

Source: Economix

Generally, crossing the borders of traditional occupations will become even more important than in the past. The integration of material science, chemistry or physics will help innovation in the area of specialty textiles. Environmental technologies will be applied in all parts of the industries, and finally management and commercial aspects will be important for all professions.

Critical competences

Due to their principal orientation and strategic choices, the scenarios demand for different types of workers with specific competences:

- The *"Globalisation limited"* scenario will have to achieve the transformation into a self-sustaining European TCL sector which is less dependent on international trade and complies with rising environmental standards. This asks for strong change management towards efficient and highly specialised company networks. Marketing channels will have to be established, apart from the existing retail business, and new brands will have to be created. Marketing specialists will, therefore, have a strong consumer-orientation with social and environmental responsibility. In parallel, administrative departments will be able to imply the new environmental standards efficiently. R&D experts will need to know about sustainable products and will have a good knowledge of traditional production technologies. Process engineering will focus on energy efficiency and emission control, and quality control will concentrate on environmental standards. This will include logistics, which will have to improve energy efficiency rather than shortening delivery times. Production will be small-scale and specialised and will reuse traditional crafts.
- In the *"Asian dominance – European excellence"* scenario, a strategic, visionary, and intercultural management will be needed which is able to establish a high-tech TCL sector in Europe. This will require interdisciplinary, multi-skilled and creative R&D staff, including engineers and designers. A strong client-orientation will be needed not only among marketing and sales workers but among production workers as well. Small batches of customised high-value products will be produced which require a sound knowledge of clients' businesses, markets and technologies. Process engineering will mainly supervise global production chains with diversified standards and short delivery times.

Critical competences

	Scenario 1 **Globalisation limited**	Scenario 2 **Asian dominance – European excellence**	Scenario 3 **Advanced New Member States**
General management	Change management Network management	Strategic, visionary, inter-cultural	Quality management, market-oriented
Marketing and sales	Consumer-oriented, socially and environmentally responsible	Client-oriented, technical know-how, trend-setting, intercultural	Competition-oriented, Market knowledge, Intercultural
Administration	Environmental legislation (REACH)	International business	International business
Research & development	Sustainable products and technologies, Traditional techniques	Interdisciplinary, multi-skilled, creative	Market-oriented, efficiency oriented, creative
Process engineering	Energy and emission control, Cost control	Supervision of global value chain	Cost control, Quality control
Production	Small scale, specialised, crafts-oriented	Client-oriented, Technical know-how	Quality-oriented, mass-production
Quality control	Environmental standards Network operations	Diversified standards	Large-scale control systems, network operations
Logistics	Energy-efficiency-oriented	Delivery-time-oriented	Delivery-time-oriented

Source: Economix

- The *"Advanced New Member States"* scenario will be based on a market and quality oriented management which is able to establish an independent TCL industry in the low-cost areas of Europe. This will require strong cost control, high efficiency of production processes and tight control of quality standards. Improvements of intermediary production skills will be particularly needed. In parallel, this strategy will rely on innovative and creative capacities of designers, engineers and business professionals, both in product development and marketing. The task is to establish an efficient and flexible type of mass-production at low costs – something which is indeed ambitious. Administrators will have to support the strategy with sound knowledge of international business and markets. Delivery time will also be important for logistic services.

Strategic impacts from the scenarios

Adjustment strategies at company level

The adjustment strategies which could be followed by TCL companies are completely different for each of the three scenarios:

Main adjustment strategies

Adjustment strategy	Scenario 1 **Globalisation limited**	Scenario 2 **Asian dominance – European excellence**	Scenario 3 **Advanced New Member States**
Brand and design strategy		●	●
Networking strategy	●		●
Industry-retail strategy		●	
Subcontracting strategy	●		
Technological leadership strategy		●	

Source: Economix

In the *"Globalisation limited"* scenario, production networks will be established in high-cost areas in order to use a broad range of competences for upgrading products and advance environmental innovation. With lower competition from Asian mass-production, producer networks will be the answer to differentiated consumer needs. In parallel, however, subcontracting will remain important for mass-products which will mainly be produced in low-cost areas.

The *"Asian dominance – European excellence"* scenario is a technological leadership scenario where European producers will only serve the upper end of markets and will abandon not only mass production but large parts of medium quality production to Asian and Mediterranean competitors. It is a brand and design strategy where marketing will be at the centre of activities. In this sense, it will also be an industry-retail strategy as large producers will transform into traders. Production networks will not survive in face of Asian competition.

The *"Advanced New Member States"* scenario assumes the transformation of TCL industries in low-cost areas to competitive production networks which will develop their own brands. Companies will be able to escape from the prevailing subcontracting system and achieve a much higher degree of independence.

Strategic choices for sector organisations, training institutions and governments

In *Scenario 1* sector organisations will present the TCL sector as a sustainable industry which complies with environmental norms. Career guidance will emphasise traditional production and business principles which will help to strengthen production networks and sustainability. Regional labour markets will be very important.

Environmental policies will be mainstreamed in all sub-policies, including emission-based restrictions for foreign trade, promotion of environmental technologies through innovation and the creation of energy-efficient clusters which will reduce transportation distances.

Public campaigns for *Scenario 2* will underline the high-tech image of the sector which needs strong specialists in engineering, science, design and value chain management. R&D policies will promote non-company based institutions in order to receive the maximum input from independent research.

The scenario describes a world of liberalised markets where full advantage is taken from specialisation and the changing allocation of production. Europe, therefore, will concentrate on using professionals in science and engineering with wide interdisciplinary knowledge. Research centres

and R&D cooperation will be more important than defending existing TCL clusters. The sector will be on the way to a high-tech industry, which has little in common with the present type of products and technologies. Large parts of consumer markets will be in the hands of big retailers. Industrial policy will be reluctant to interfere with the restructuring process.

In *Scenario 3*, TCL industries will appear as a European industry which is not only able to compete with the strong Asian countries but re-attracts some parts of the production to Europe. A strong business development orientation will prevail with the focus on management, marketing and design. The networking approach will lead to a considerable change of work organisation in small and technology intensive firms. Regional labour markets will be very important.

It is the alternative with the strongest demand on industrial policies which explicitly support business foundations, strengthen regional clusters and promote process innovation, design and marketing. Governments also protect the sector by enforcing narrow anti-dumping rules and a stronger protection of intellectual property.

Human resource policies to meet skill needs

The common challenge in all scenarios is the further decline of employment. Company restructuring appears to be difficult in such a situation. While markets demand a high speed of restructuring in all areas – products, technologies, and organisation – the human resource policy in companies is determined by low labour turnover, the great importance of internal labour markets, and an ageing workforce. Particular skills shortages appear among emerging skills which are scarce due to low labour supply and strong competition among employers.

In parallel, wages are limited by strong cost pressure from abroad. This restricts wage offers to highly skilled workers who would be needed to increase innovation and improve economic performance. Specialty textiles are particularly affected by this phenomenon as this sector requires highly innovative engineering staff. Restructuring in the New Member States is also restricted as highly qualified workers search for jobs in high-wage areas rather than their home countries.

Finally, training is at risk in highly specialised but declining industries. Decreasing training participation puts training courses at risk or even leads to the closure of training centres. Students and workers also have little incentive to invest in training if they face limited labour demand and high unemployment risks. Market forces alone, therefore, lead to a downward spiral of extending skills shortages in face of declining employment. Governments are, therefore, under particular pressure to compensate such market failures and provide training facilities for the sector in those regions where TCL can be expected to survive.

Implications for education and training

The accumulation of human capital remains a pivotal task in all three scenarios as the strategic reorientation of businesses can only be achieved on the basis of a well educated staff with the training required to create an efficient workforce.

In *Scenario 1,* vocational training will promote the reorientation through knowledge transfer in the areas of environmental protection and crafts-related skills. Training will be strongly company-based in order to achieve the transfer of practical knowledge. Training institutions will have to gradually adjust to the new types of work, different from industrial standards in the past. Vocational training, however, will not only focus on environmental issues but will also entail the full spectrum of vocational training in order to develop intermediate skill levels in particular.

Training in *Scenario 2* will be strongly opposed to the first scenario: It will focus on tertiary education in engineering, design, business management, and marketing. Large parts of production related training at the intermediary level, however, will be abandoned. A new material science based on fabrics will be created in close cooperation with interdisciplinary research centres. Parts of training will be professionalised and internationalised. The other part will concentrate on sales competences at low and medium skill levels.

For *Scenario 3,* institutional vocational training will be more important than company-based training as rapid upgrading of knowledge is required in many areas, particularly in business and management practices. The scenario will also strongly rely on human capital investments, in low-cost areas in particular, in order to achieve economic independence. This requires knowledge transfer, especially from high-cost areas, but also improvements of career structures and image campaigns. Recruitment from abroad will be important as well as retraining the labour force. Training policies try to fill the skills gaps by promoting studies in business administration, engineering and intermediary skills. This seems to come from public investment as companies in the low-cost area can hardly fund additional training.

Conclusions and recommendations

With these expectations the European Union faces the principal choice between the transition into a de-industrialised economy and defending manufacturing production capacities by means of intelligent adjustments in industrial branches.

The way to a de-industrialised economy is certainly what present transition trends indicate. As the production of manufactured goods – TCL products in particular – is less profitable than the production of services, the growth potentials lie in services. The transition to a service economy, which has been underway for a long time, follows the economic rationale of the international labour division. Liberal global markets are seen as the basis for achieving the economic optima.

This, however, appears as constrictive logic which, on the one hand does not fully account for the external ecological costs of a global economy, or the imbalances on European labour markets on the other hand. These two arguments are the basis for the alternatives to the “Asian dominance – European excellence” scenario.

Climate change can be expected to cause enormous costs, which will become evident from increased expenditure on environmental protection or various climate catastrophes. The appearance of environmental costs will transform economic incentives and weaken the advantages of global labour division. Moreover, environmental disasters may rapidly change public opinion and policy action. They can be expected to change normative reference systems of societies substantially and thus lead to a conversion of economic regimes.

As far as jobs are concerned, rapid industrial change can avoid imbalances on labour markets only if the job potentials of growing sectors are strong enough to absorb human resources from declining industries. The experience from European countries (and the US), however, reveals that this was not the case over the last decades. Facing this experience, the option of defending industrial jobs in Europe is not that far away.

Of course, this cannot be done with a conservative approach. Preserving existing jobs appears to be the guarantee for disappearance. However, using the potentials of European economies – existing wage differentials in particular – and creating competitive firms in promising regional clusters is an alternative to the pretended advantages of the global labour division.

None of the scenarios come without a price. While the price of carrying the present regime forward ("Asian dominance – European excellence" scenario) lies in neglecting environmental risks and job destruction, the alternative scenarios will curb overall growth. The "Globalisation limited" scenario will see slower growth due to the disintegration of the world economy. The "Advanced New Member States" scenario intends to invest in low-productivity sectors and thus depends on low wages.

These negative impacts reveal that the scenarios are real alternatives: Europe has the choice between the continuation of its growth strategy, an ecological economy or a "jobs first" strategy. All three scenarios can hardly be achieved in parallel. At least at EU level the scenarios are exclusive. This, however, does not mean that Member States might not follow different approaches. In contrast, the diversity of approaches reduces the risk of wrong expectations and helps identifying promising strategies. A uniform industrial policy at EU level, therefore, is not intended with this appraisal.

The study does not prefer any of the scenarios in the sense of a clear recommendation for one of the pathways. This is attributed to the ambiguity of the scenarios. It will be a political decision to evaluate the different strategies, and to develop new ones. Nevertheless, there are some common recommendations resulting from all scenarios:

- *Developing the knowledge base:* facing the situation of an eroding training system, it is recommended to apply a strongly selective HR policy concentrated on the regional centres of TCL production in Europe, particularly in France, Italy, Portugal, Belgium, Germany and some of the New Member States. Public investments in training structures need to be concentrated in order to modernise training. Universities could be at the centre of regional clusters in close cooperation with firms and intermediary training facilities. Strong links are necessary between employers, training institutions and workers (trade unions).

  The New Member States need particular attention as training structures are not fully developed. Beyond engineering and design, companies require strong inputs from professional business specialists who are able to organise the value chain efficiently, undertake convincing marketing initiatives, and optimise human resource management. This should create the basis for a greater independence of TCL companies. National and local governments are particularly stipulated in this respect. Highly qualified engineers, designers, and business professionals are required for this. The critical competences which appeared in the scenarios should be developed.

- *Innovation strategies:* Innovation will be a precondition for the survival of European TCL industries. Private investments in the development of specialty textiles should be supported by promoting the cooperation between textiles and other branches like chemistry, construction, and medical science. Machinery producers should contribute to the development of new methods of garment production. Logistic systems should be improved to lower transportation costs. An interdisciplinary approach should be fostered rather than segmented specialisation.

  The European Technology Platform suggested a "niche-strategy" exploiting the technological leadership of European producers in many ways. There is little doubt that highly specialised products are better protected from international competition, usually address clients' needs better than mass products, provide higher shares of value added and above average profit rates, and are located in growing rather than declining markets. However, this can hardly be a strategy for the three million jobs in European TCL industries.

- *Regional policies:* TCL industries in Europe need a strategy to defend the share in mass consumption markets. The New Member States are those which would be best positioned to compete with the Asian competitors. As this competition is not only driven by labour costs,

the game is not single tracked: flexibility and speed of production, marketing channels and logistics, high productivity of labour, organisation and machinery are all important ingredients of competitiveness and should be developed. The development of regional TCL clusters – as was undertaken by China – might, therefore, help to improve the competitiveness of European mass producers. This requires a low-cost strategy supported by trade unions and workers, a human-capital strategy developing regional labour markets, an efficient organisation of the business environment, and a marketing strategy expanding the sales networks worldwide.

Past experience has shown that the escape from the S-efficiency model is the only way to achieve economic sustainability. As competition among pure subcontractors is price driven rather than quality driven, competence building in design, branding and marketing is pivotal for an escape. The French Val de Loire is a good example of this strategy. This example also points to the fact that individual companies are hardly capable of achieving a more independent market position. Cooperation and networking are therefore required among regional producers, and public support is needed to implement regional strategies. A selective regional development strategy should be developed, which evaluates the economic potential of TCL suppliers, identifies its strengths and weaknesses, implements development programmes and – most importantly – creates the links between actors.

List of recommendations

Topic 1: Industrial policies

EU	• Evaluate alternative industrial policy approaches • Assess alternative regional clusters • Develop a portfolio of alternative policy approaches with Member States
National authorities	• Select the optimal approach • Assess alternative regional clusters • Develop a strategy to safeguard low-skill workplaces
Social partners	• Contribute to the identification of optimal approaches considering economic growth, employment levels and environment

Topic 2: Employment and human resource policies

EU	• Support good practices in restructuring • Support active ageing policies
National authorities	• Reduce non-wage labour costs • Contribute to TCL related human resource investment • Support good practices in restructuring • Support active ageing policies
Companies	• Create a positive image on labour market with the help of leading companies • Improve internal adaptability of the workforce • Preserve the knowledge base by lifelong learning • Set up good HR practices and career path developments to struggle against turnover and attract newcomers in the sector • Build mobility solutions within the sector instead of lay-offs
Social partners	• Support HR policies without early retirement and an effective ageing policy, new career paths • Promote agreements about employment, restructuring, ageing policies

Topic 3: Skills adjustment

EU	• Support training structures in regional clusters • Promote R&D in regional clusters • Create cross-border training networks with companies, training institutions and workers • Support interdisciplinary approaches with material science, chemistry, physics, and business administration • Reinforce new competence standards • Support research on ecological aspects of TCL production and consumption • Promote lifelong learning • Promote exchange of students • Redirect ESF funds towards human capital investments
National authorities	• Concentrate investments in education and training structures (universities) on regional production centres • Develop skills at intermediary levels • Focus on critical competences: – Strategic and visionary management – Intercultural competences in many functions – Network-based value chain management – International marketing and branding – Interdisciplinary and multi-skilled engineering – Quality-oriented production – Ecological knowledge as a cross-occupational competence • Envisage complementary factor to training: R&D, regional policies establish and support training structures in regional clusters • Modernise training • Develop management, marketing, business administration, engineering and design in the NMS • Support branding in the NMS controlling • support cooperation between companies and training institutions
Regional authorities	• Develop regional TCL clusters if appropriate • Envisage complementary factor to training: R&D, regional policies establish and support training structures in regional clusters

	• Focus on critical competences (see above) • Support cooperation between companies and training institutions
Companies	• Promote lifelong learning • Develop intermediary skills • Preserve learning abilities of the workforce
Social partners	• Reinforce involvement in training issues

Topic 4: Innovation

EU	• Support R&D investments • Support knowledge transfer
National authorities	• Improve interdisciplinary research • Create research centres in regional clusters • Support company based R&D and knowledge transfer
Regional authorities	• Develop regional centres of TCL innovation • Invest into training infrastructure • Consider the high interdependency of the knowledge base with regional economic and social conditions
Companies	• Expand R&D activities • Create R&D networks and improve collaboration
Social partners	• Improve the image of regional clusters • Support networks and improve collaboration

Topic 5: Equal opportunities

Companies	• Provide equal opportunities for men and women in both technical and design oriented tasks • promote women in management positions
Social partners	• support and negotiate agreements about equal treatment of men and women

Topic 6: Regional policies

EU	• Identify and support regional TCL clusters • Focus on NMS • Avoid mainstreaming of development approaches
National authorities	• Identify and support regional TCL clusters • Provide economic and technical research evidence
Regional authorities	• Concentrate resources according to regional conditions • Develop regional labour markets • Develop regional knowledge base
Social partners	• Address employment issues at the local level

Source: Economix

1. Mapping the sector (Step 1)

The scenarios up to 2020 are built on the identification of main trends and market conditions of the sector. This includes the statistical definition, the description of the manufacturing processes and the analysis of markets, technologies and skills trends since the year 2000. Moreover, the discussion on the strategic choices for TCL industries in a global environment appears to be important.

Expert panel 9/10 October 2008:
The expert panel discussed the necessity of disaggregating the industry into sub-sectors. The separate presentation of the tanning and dressing of leather and footwear was particularly requested.

Statistical data for these sub-sectors, however, are rare. Employment data is faced with increasing sampling errors for small branches, and cross-sections with occupational and country variables are not possible.

The study therefore uses all available empirical evidence for the sub-sectors without presenting full statistical information at the disaggregated level.

The period from 2000 to 2006/2007, for which most of the statistical indicators are available, covers the termination of the European import quota systems which determined the sector for many years. Strong reactions of foreign trade towards liberalisation indicate that the sector is once again in a transitional phase, without having found a new equilibrium position yet. All interpretations of empirical findings for this period therefore have to consider this historical context.

Most of the data used in this section was provided by Eurostat and CEDEFOP. Some data had to be estimated in order to cover the full period and all EU countries. International data was taken from ILO sources and other international organisations.

1.1. Definition of the sector

1.1.1. Statistical definition

According to NACE rev. 1.1 the sector comprises of three major branches (Table 1):

Table 1 NACE sectors and sub-sectors

NACE rev. 1.1	NACE Description	Identifiers used in this study
17, 18, 19	**Manufacture of textiles, wearing apparel and leather products**	**TCL industry**
17	**Manufacture of textiles**	**Textiles industries**
17.1	Preparation and spinning of textile fibres	
17.2	Textile weaving	
17.3	Finishing of textiles	
17.4	Manufacture of made-up textile articles, except apparel	
17.5	Manufacture of other textiles	
17.6	Manufacture of knitted and crocheted fabrics	
17.7	Manufacture of knitted and crocheted articles	
18	**Manufacture of wearing apparel; dressing and dyeing of fur**	**Clothing industries**
18.1	Manufacture of leather clothes	
18.2	Manufacture of other wearing apparel and accessories	
18.3	Dressing and dyeing of fur; manufacture of articles of fur	
19	**Tanning and dressing of leather; manufacture of luggage, handbags, saddlery, harness and footwear**	**Leather/footwear industries**
19.1	Tanning and dressing of leather	
19.2	Manufacture of luggage, handbags and the like, saddlery and harness	
19.3	Manufacture of footwear	

Source: Eurostat

- manufacture of textiles (17)
- manufacture of wearing apparel; dressing and dyeing of fur (18)
- tanning and dressing of leather; manufacture of luggage, handbags, saddlery, harness and footwear (19)

The following text continuously refers to this classification. In order to avoid the lengthy titles of the statistical classification, the short identifiers listed in Table 1 are used.

1.1.2. Type of products and production process

Textiles

Textiles production happens in two major steps: the production of yarn from spinning natural or man-made fibres, and the production of fabrics by weaving or knitting. The raw materials used for textiles are cotton, wool, silk and other natural fibres (coco, corn, hemp etc.) or man-made fibres from polyester, nylon, acryl, or cellulose. Among the natural fibres the majority of textiles are made from cotton. Most of the man-made fibres are based on polyester. Both yarn and fabrics can be treated by dyeing, printing, softening and other processes.

Fabrics are mainly used for apparel but are also used for furniture, drapes and other home textiles. Moreover, the industrial use of textiles in the automobile industry and particularly in construction, health services, agriculture or packaging is an important segment of textiles production. This market segment is known as 'specialty textiles' and has become the most innovative and rapidly growing part of the industry.

Textiles production is highly capital intensive and requires a small amount of human labour. Production processes have to be supervised and controlled continuously. This requires knowledge of material attitudes, machinery and organisation rather than craft-related production techniques. Production is navigated by textiles engineers, designers and business professionals.

Clothing

Clothing production forms the flat fabric into a "3D-shell" for human beings using a wide range of processes: design, pattern making, grading, nesting and marking, cutting, sewing, quality inspection, pressing and packaging. Many of the jobs are repetitive and monotonous and thus use unskilled labour.

There is a continuous development of technology at all levels of activity. However, during 300 years of innovation, no technical substitute has been found for human hands able to handle and sew fabrics – a task which is still too complex for robots (Allwood 2006). The industry, therefore, is permanently searching for locations with cheap labour, and is able to find it because the production of textiles and clothing is part of all cultures throughout the world. Production facilities are rapidly relocated.

Leather and footwear

The leather and tanning industry covers the treatment of raw materials (conversion of hide or skin into leather), and the finishing of leather with a wide range of chemical products. Raw materials mainly come from cows and pigs but a variety of other hides and skins are processed. Leather production is located in regions specialised in cattle and pig breeding in Europe, and North and South America. The quality of leather is strongly determined by cattle and pig species. The Alpine region is one of the leading producers of high-quality leather. Technical progress mainly comes from chemistry which provides the substances for tanning and finishing. Apart from the production of luggage and handbags, footwear is the most important final product from leather. Moreover, clothes, furniture, car/air craft interiors are all made from leather.

Footwear production uses a wide range of materials, such as textiles, rubber and a variety of synthetic products. There is a continuous substitution process of these materials driven by consumer preferences and prices. With the use of synthetic materials, footwear production has become more capital intensive. Similar to clothes manufacturing, however, human labour can hardly be substituted.

Product spectrum of TCL industry

The TCL sector produces a great variety of products (Table 2). Among textiles, the production of "Other textiles" is the biggest product area including a great number of specialty textiles. This is

followed by weaving and made-up textile articles. The European clothing industry mainly produces outerwear. The leather/footwear industry is concentrated on footwear.

Typically, this is a combination of sectors allocated in the same value chain. Not only textiles and clothing are part of the sector, but also the whole production line of textiles (spinning, weaving, manufacture of textiles, finishing), and of leather (tanning, dressing and manufacture of leather products). In contrast to other sectors this is certainly like mechanical engineering, where large parts of the upstream sectors are allocated in other parts of the classification.

Some of the sectors operate in similar consumer markets (e.g. clothing and leather clothes), and thus have a competitive relationship. Others are complementary, like clothes, footwear and accessories. Moreover, it is a combination of capital and labour intensive production. The heterogeneity of the sector recommends subdividing the analysis into the three sectors 17, 18 and 19.

Table 2 Product spectrum of TCL industry
EU27; 2004

Product area	% share of TCL value added
Textiles:	**47.5**
Other textiles	11.9
Weaving	9.2
Made-up textile articles except apparel	7.5
Finishing	6.0
Preparation and spinning of textile fibres	5.4
Knitted and crocheted articles	5.3
Knitted and crocheted fabrics	2.2
Wearing apparel	**34.9**
Outerwear	21.6
Other wearing apparel, accessories	5.9
Underwear	4.9
Workwear	1.6
Dressing and dyeing of fur	0.4
Leather clothes	0.4
Leather and footwear	**17.5**
Footwear	10.7
Luggage, handbags, saddlery etc.	3.8
Tanning and dressing of leather	3.0
Total	**100.0**

Source: Eurostat (2007)

1.2. Economic trends

1.2.1. Performance of the industry

In 2004, TCL industry of the EU27 consisted of about 266,000 enterprises, which generated 67.8 billion euros of value added. This corresponds to 1.3% of the value added in the non-financial business economy. The sector employed 3.4 million workers. This was 2.7% of the non-financial business economy workforce (Table 3).

Measured in terms of value added, the major part of the industry comes from textiles manufacturing which contributed to 47% in 2004. Clothing had a share of 35% and leather/footwear produced 18% of the overall value added. The employment structure is the opposite with a share of 46% in the clothing sector, 36% in textiles and 18% in leather and footwear.

On average it is a small-sized, low productivity and labour intensive sector. Turnover per company was 0.9 million euros in 2004. Each person employed produced a value added of 19,900 euros which was only 48.6% of the productivity of the non-financial business. This was close to the hotel and catering sector. About 72% of turnover was spent on materials, capital costs and other costs. 28% was left as added value. Three quarters of value added was spent on labour costs and one quarter remained as a gross operating surplus. In relation to turnover the gross operating rate was 8.7%. This was only 21% below the average in the non-financial business.

Table 3 Basic economic figures 2004
EU27

	Textiles, Clothing, Leather/ Footwear	Textiles	Clothing	Leather/ Footwear
Number of enterprises (1000)	266.1	77.3	141.8	47.0
Turnover (billion euros)	242.0	112.0	84.5	45.0
Value added (billion euros)	67.8	32.0	23.5	12.0
Employment (1000)	3409.9	1216.5	1583.4	610.0
Turnover per company (1000 euros)	909.3	1448.9	595.9	957.4
Value added / turnover (%)	28.0	28.6	27.8	26.7
Value added / person employed (1000 euros)	19.9	26.3	14.8	19.7
Average personnel costs (1000 euros)	14.8	20.0	11.0	14.0
Gross operating rate (%) (value added minus personnel cost in relation to turnover)	8.7	8.4	9.3	8.1

Source: Eurostat (2007)

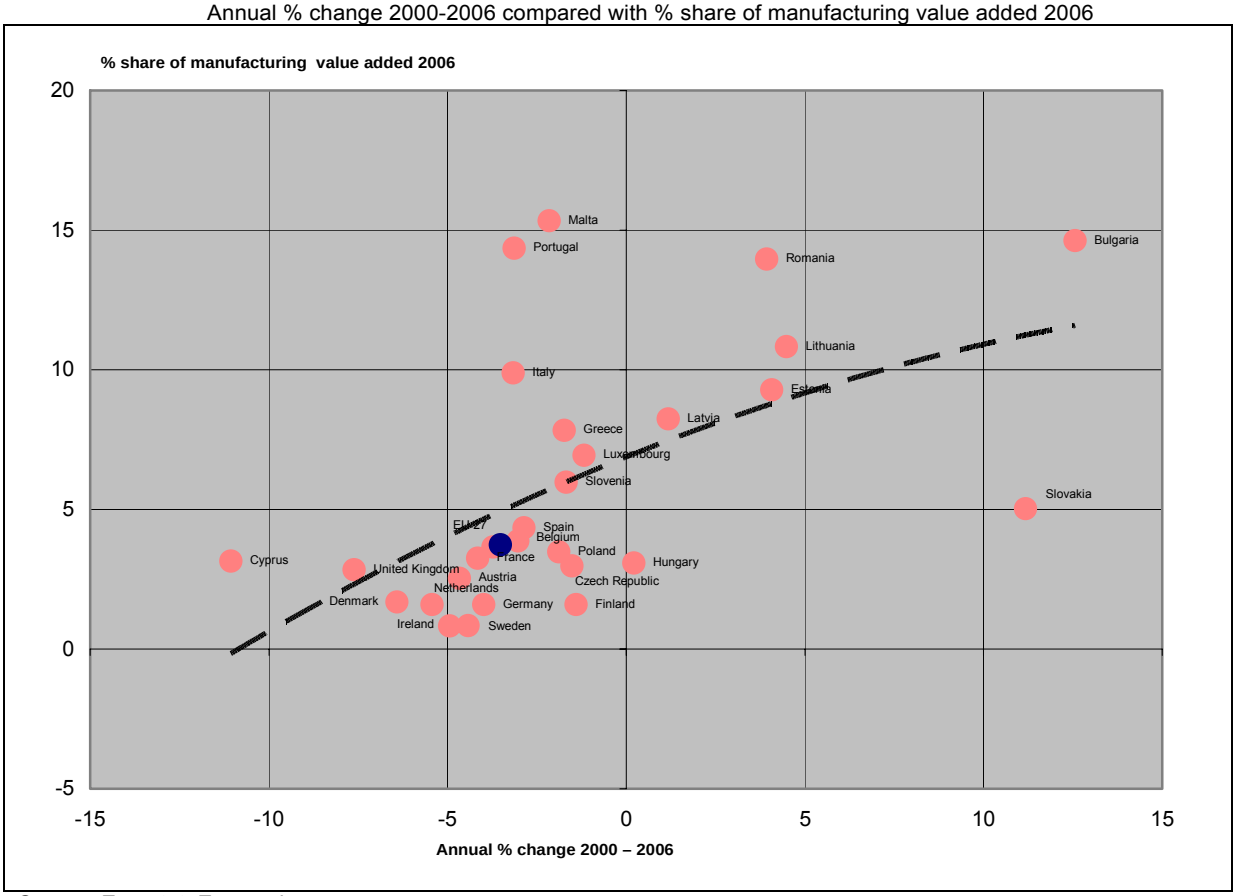
Despite small firms and low productivity the sector was able to achieve a relatively good economic performance. This is certainly a key to explaining the TCL business. Through low wages and continuous product adjustments, marketing and business strategy firms were able to achieve an economic profitability which remained within the normal spectrum of the overall economy and was comparable to other small-sized enterprises. This did not avoid the continuous shrinkage of production volumes and employment, but it did keep a considerable number of businesses in the markets.
Of course, the situation is very different among the three sub-sectors: the textiles industry is the largest among the three branches, achieving an average turnover of 1.45 million per company. Average clothing turnover was only 41% and leather/footwear achieved 65% of the textiles average. Cost shares were very much the same in the three sub-sectors, but productivity and labour costs strongly differed. In the clothing sector both productivity and staff costs were 75% of the average and only 55% in the textiles sector. The leather/footwear industry remained slightly below the average. The clothing sector, however, showed a better profitability achieving a gross operating rate of 9.3%, compared to 8.4% in the textiles sector and 8.1% in the leather/footwear sector.

1.2.2. Regional specialisation

Italy is the principal manufacturer of textiles, clothes and leather/footwear products in Europe. It contributed one third of the EU27 value added in 2006, followed by Germany and France, both with a share of 11%, and Spain and the United Kingdom with shares of 9%. Portugal contributed 4.3% of European value added, Belgium 3.1% and Poland 3.0%. The shares of all other countries were around or below 2% (Table A 3, Data Annex).

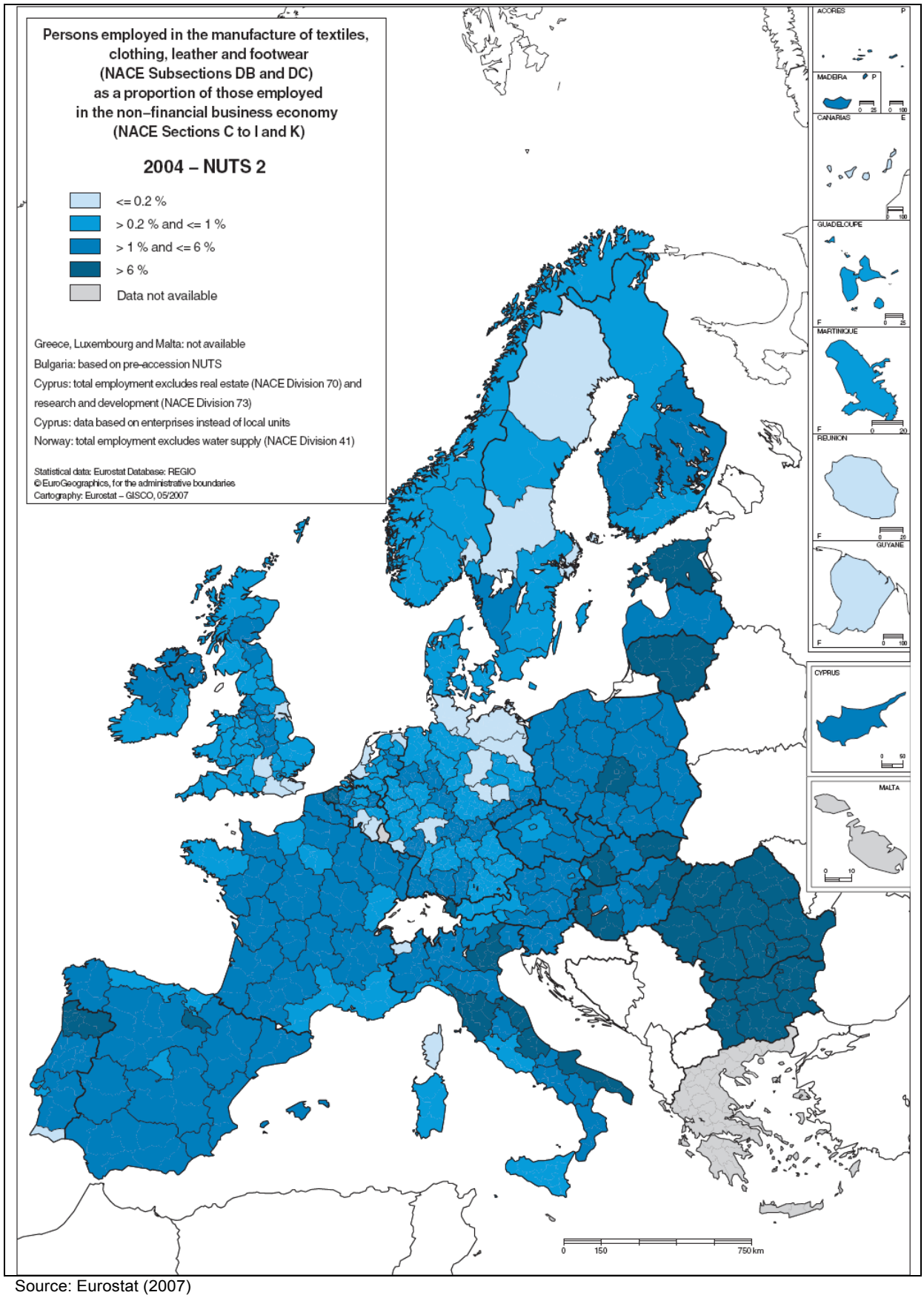
Similar patterns appear in the sub-sectors: Textiles, clothes and in particular leather/footwear products are mainly produced in Italy. In 2006, Italy had a share 29.1% of the EU27 value added in the textiles industries, 31.7% in the clothing industries, and 47.7% of leather and footwear. In textiles, countries like Germany, UK, France and Spain are also important with shares around 10%. Clothing industries are located in France, UK, Spain and Germany – in addition to Italy – while leather/footwear industries are also concentrated in France and Spain.

Chart 1 **TCL value added by EU Member States 2000-2006**
Annual % change 2000-2006 compared with % share of manufacturing value added 2006



Source: Eurostat, Economix

Chart 2 **Regional concentration of employment**
2004



Source: Eurostat (2007)

TCL industries in the EU27 countries had a share of 3.6% related to value added of the manufacturing sector in 2006. Chart 1 shows the wide distribution of this concentration index among the

EU countries: Malta, Bulgaria, Portugal Romania, Lithuania, Estonia and Italy are all above 10% while the majority of countries were below that level.

High concentration of manufacturing activities in TCL industries yielded positive output growth as the comparison of concentration rates and growth rates indicates (Chart 1). The New Member States in particular developed TCL specialisation further, while Portugal's and Italy's TCL industries shrunk – as did most of the other countries' TCL sectors.

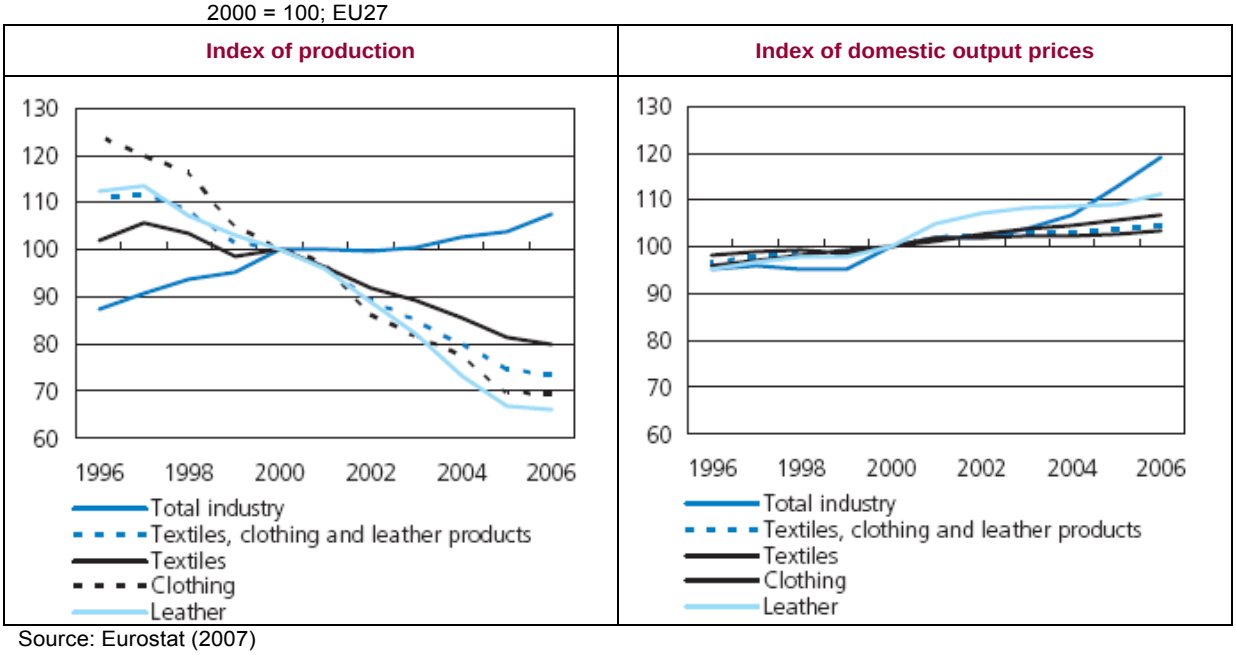
Employment declined in almost all countries, except Bulgaria, Slovenia and Slovakia. Bulgaria was the only country which experienced a considerable increase in the number of jobs during this period. In terms of employment relative to national non-financial business, Bulgaria had the highest share (12%), followed by Portugal (10%), Lithuania (8%), Estonia (7%), and Slovenia (6%).

The details of the regional concentration of TCL employment are given in Chart 2. The most specialised NUTS 2 region was Norte in Portugal where 21% of the workforce are in the TCL industry. A high concentration in this sector can also be seen in various regions of Italy and the New Member States. In particular, Bulgaria and Romania but Hungary, Slovakia, Estonia and Lithuania are also among them.

1.2.3. Output and prices

TCL industries experienced a rapid decline in output and prices for ten years since 1996 (Chart 3). Overall production shrunk at a rate of 4% annually, which meant a loss of one third of the production volume during this period. In 2006, the production index declined moderately, compared to the preceding five year period of strong decline (-6% per annum). These developments are a sharp contrast to the general upward trend for the industrial sector as a whole.

Chart 3 Production and output prices
2000 = 100; EU27



Source: Eurostat (2007)

The textiles industry performed much better than the other two sub-sectors. Production volumes declined by 22% during 1996-2006, while clothing lost 45% and leather/footwear 32%.

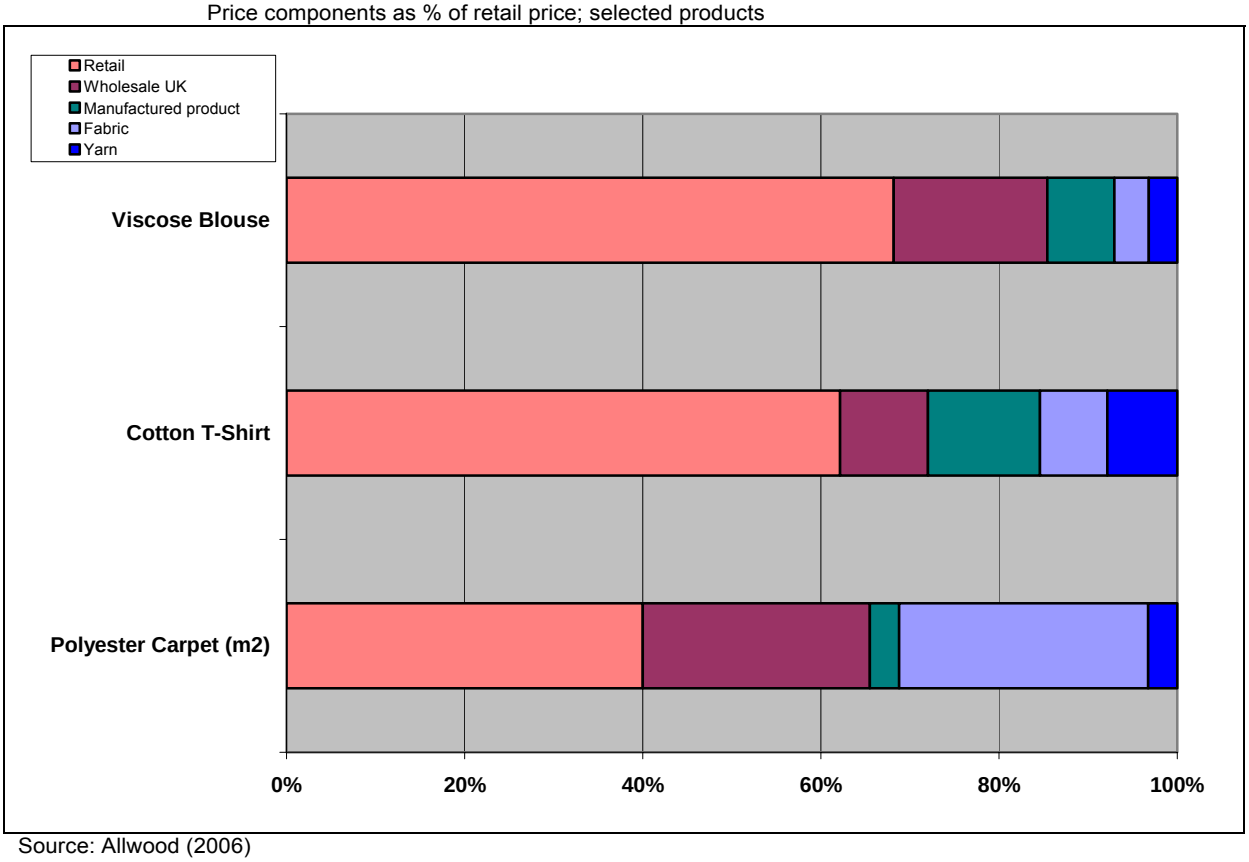
Compared to the United States and Japan, the reduction of value added in the EU27 TCL industries was less pronounced. These two countries experienced a 6.6 and 7% annual decline of value added in constant US $ during the 1997 to 2003 period (Table A4). This was almost twice the rate of the EU27 countries. China however was able to achieve the extraordinary growth of 13.5% per annum during these years. The Chinese TCL industries grew more rapidly than manufacturing in total. Nevertheless, in 2003 the share in manufacturing output was 2.2 % – still below the TCL share in the United States (2.9%), Japan (2.6%) and EU27 (3.7%).

Prices also increased much slower than manufacturing prices in total. While domestic output prices of manufacturing products increased by 25% between 1996 and 2006, textiles, clothes and leather/footwear products saw an increase of only 8% (Chart 3). This means a relative decline of output prices of 13% during that period.

Globally, the cost and price structures of the sector are characterised by high profits from innovation, marketing and retail but low profits from sourcing, production, assembly, finishing, packaging and logistics. This fact became evident with the symbolic withdrawal of Marks and Spencer from UK clothing and textiles manufacturers in the 1990s. Similarly, the Spanish Cortefiel group completely transformed its previous manufacturing activities into a competitive retail business.

Chart 4 **UK price structures**

Price components as % of retail price; selected products



Source: Allwood (2006)

As case studies in UK markets revealed, only 15% of the retail price for a viscose blouse are paid to foreign producers (made in India), and 85% are taken by wholesale and retail trade – retail trade in particular (Chart 4). For cotton T-shirts the relation is less unfavourable for the (Chinese) producers. They are estimated to receive 30% of the sales price. UK carpet producers receive 35% of the consumer price (Allwood 2006).

This demonstrates the dominating role of UK retail and wholesale businesses in clothing and carpet markets. Such a high share of the trading sector in total revenues from TCL sales would

explain the strong focus of European companies on marketing and sales – as far as this is an EU-wide phenomenon. It would also explain the decline of production as the competitive position of producers is weak compared to their clients from the trading business.

1.2.4. Consumption trends

In principle, consumer orientation appears to be related to cultural attitudes. Clothing styles are determined by social status, business conventions and historical traditions. The observation, therefore, is that consumers differ quite strongly among Member States regarding their fashion orientation, quality preferences or price sensitivity. In parallel, fashion trends are spreading world-wide with the help of press media and the internet. The use of "fashion scouts" indicates that these trends are created on the streets rather than in design studios and confirms that the control of TCL producers and retailers regarding fashion trends remains limited.

Consumer research points to substantial changes of consumer orientation in clothing markets (Perotti-Reille 2008):

- *Consumers are individualising;* consumption detaches from basic needs, becomes more hedonistic and has a strong emotional component.
- *Consumers are professionalizing*; they are better informed about products and markets and develop their optimal purchasing strategies on this basis.
- *Consumers want to be participatory*; they want to interact with producers, retailers and service providers on the type of products offered, quality, and design. They want to be co-inventors.
- *Consumers claim for social and ecological responsibility*; the use of child-labour, poor environmental conditions or bad product quality rapidly lead to a boycott of certain brands or producers. This may even be extended to certain regions or nations.

This leads to an increasing fragmentation of markets which calls for a change in production regimes (overcoming mass production principles) and differentiated distribution channels. The immaterial value of products is becoming important.

Real consumer behaviour, however, seems to be different: consumer prices for wearing apparel are declining continuously, imports of mass-products from low-cost countries are rising, and the big retail chains who offer low-price products are the winners in clothing markets. Approaches to mass-customisation have more or less failed in the past and individualised production only survived in high-price niches. Consumers are obviously very price-sensitive and easily abandon their aspirations if they are not free. As UK research reveals, a clear move in consumer behaviour is heading towards "a culture of cheap, disposable fashion" (Allwood 2006).

This does not indicate a fundamental change of consumer behaviour in the near future. Consumer preferences appear to be stable as far as the principle orientation of consumer behaviour is concerned, but they are variable regarding fashion styles. While colours, cuts and fabrics are changing unpredictably, the principle consumer orientation and behaviour will not change fundamentally.

This is also reflected in the continuous decline of the share of TCL consumption in total consumer expenditures. Between 2000 and 2005 the share of clothing consumption in total consumer expenditures declined from 5.2% to 4.7% (Table 4). This is 1/10th within five years. The reduction was particularly strong in Slovakia and Ireland, but can be discerned in almost all EU countries. In Sweden and the UK the share stagnated, and expanded in Denmark, Finland, Estonia, and Lithuania.

The reason for the broad decline of clothing consumption is seen in the fact that consumers move up the Maslow pyramid of needs from basic physical needs to socially and individually oriented consumption. The fact that the share of clothing consumption is declining thus confirms the view that consumers in total are not becoming more sophisticated or demanding. Their demands are targeted at other parts of consumption like IT-related appliances, communication and services.

Table 4 **Private consumption and prices**
EU27

Country	Retail sales textiles, clothing, leather/footwear 2000-2006 Average annual change in % (current prices)	Clothing			
		Share of total consumption		Domestic prices	Import prices
		2000 %	2005 %	2000-06 Average annual change in %	2000-06 Average annual change in %
EU27	3.2	5.2	4.7	-0.3	-4.2
Austria	1.5	5.9	5.6	-0.4	-10.5
Belgium	1.8	4.5	4.1	0.3	-3.6
Bulgaria	14.1			0.2	
Cyprus	4.5	5.2	4.8	-2.8	-38.7
Czech Republic	6.4	3.9	3.7	-3.6	-14.9
Denmark	6.0	4.1	4.2	-0.5	-10.7
Estonia	24.8	5.1	5.3	2.6	-7.3
Finland	4.1	3.9	4.0	-0.4	-3.3
France	5.5	4.4	4.0	0.1	-1.3
Germany	-0.2	5.1	4.5	-0.6	-3.9
Greece	4.9	8.9	8.3	3.1	-0.8
Hungary	8.4	3.4	2.7	1.6	14.2
Ireland	7.0	5.8	4.1	-3.1	-6.2
Italy	0.2	7.0	6.1	1.5	-2.2
Latvia	29.3	5.4	4.8	1.2	-6.4
Lithuania	26.1	4.0	4.2	-2.0	20.5
Luxembourg (Grand-Duché)	1.4	3.7	2.8	1.0	-12.3
Netherlands	1.4	5.1	4.5	-0.8	-3.3
Poland	14.2	3.3	2.9	-2.3	-7.0
Portugal	1.2	6.3	6.0	0.1	-3.0
Romania	28.8			7.2	
Slovakia	-5.7	3.6	2.4	0.8	-5.4
Spain	4.7	4.9	4.2	1.9	-4.2
Sweden	5.2	4.5	4.5	0.5	-3.1
United Kingdom	4.6	5.2	5.2	-5.7	-4.5

Source: Eurostat

1.2.5. Foreign trade

High trade deficits in clothing

Extra EU trade of the European TCL industry is characterised by high deficits (Table 5). In 2006, the trade deficit was around 51.7 billion euros. Deficits appear in all sub-sectors but are particularly big in clothing. China, meanwhile, has a share of 33% of EU27 textiles and clothing imports, and – most importantly – the share of leather and leather product imports rose to 47.7% in 2006. Import prices for clothes declined by 23% in the period from 2000 to 2006, and by 6% for textiles.

Nevertheless, intra-EU trade still dominates the trade flows of the EU27 Member States: almost three quarters (71.9%) of the total intra and extra EU-exports were intra trade flows. This share is higher than for intra EU trade of industrial goods.

Expert panel 9/10 October 2008:
Following some of the experts, the surprise is that European TCL industries survived the end the quota system, in particular if prevailing risks are considered:

- The overvalued euro
- The cost effects of environmental regulations (REACH)
- The lack of quality standards in international trade
- Social dumping by Asian countries which is more or less accepted by European governments and consumers
- Scarce financial resources
- The poor attractiveness of the sector for young workers and the resulting lack of a well-trained labour force.

The leather sector also suffers from restricted raw material supplies due to strong international competition and protective regulations.

Several Member States achieved a trade surplus in 2006. Italy is the strongest among them with a positive export import balance for textiles, clothing and leather products of 16 billion euros. This, however, has progressively narrowed in recent years due to the decline of exports to non-EU countries. With a share of 13% among Italian exports, TCL is an important foreign trade sector. Foreign trade of other Member States is even more concentrated on TCL: Romania's TCL exports have a share of 22.7%, Bulgaria with 18.2%, and Portugal with 15.9%. Together with Belgium, all these Member States achieved positive TCL trade balances in 2007 (Table A 4).

Table 5 Extra EU trade flows 2007 (EU27)
Billion EURO

	Import	Export	Trade balance
Textiles	22.3	19.9	–2.4
Clothing	58.0	16.6	–41.4
Leather and leather products	24.7	15.3	–9.4
Total	104.0	51.8	–52.2

Source: Eurostat

Turmoil during ATC phase out

Recent trends in textiles and clothing markets were dominated by the phasing out of the Agreement on Textiles and Clothing which terminated two hundred EU import quotas by 1 January 2005 (OECD 2007). This caused a tremendous surge of imports from China but also led to some turmoil in international trade (Table 6). For example, imports of pullovers increased by 534% in early 2005 and men's trousers by 413% compared to the previous year. The response to this was the re-introduction of import quotas in 2005. These, however, were not able to stop imports from China, at least not in 2005: imports of apparel products grew by 45% and textiles by 22% in 2005.

India and Vietnam also profited from trade liberalisation. Other countries which formerly benefited from preferential trade flows had to accept negative impacts. Morocco, Tunisia, Madagascar and Bangladesh were among them, as well as Korea, Australia and Thailand. All these countries experienced shrinking exports.

In 2006, trade flows seemed to be redirected into the old channels, but data from 2007 indicates the recovery of China's strength. By 2008 all import quotas were cancelled and textiles and clothing markets can be expected to be dominated by market forces again.

Trade liberalisation had significant impacts on consumer prices. On average, clothing prices fell 16.2% relative to consumer prices for EU15. However, there is a huge geographic variation around this trend. The greatest decrease in consumer prices could be observed in Ireland and Great Britain, where relative clothing prices have fallen by about 50%. At the other extreme, consumer prices in Italy and Spain have remained largely unchanged during this period (Francois et al. 2007).

Table 6 EU25 imports by region
Billion US$

	Textiles and Clothing		Textiles		Clothing	
	2005	2006	2005	2006	2005	2006
China	21.1	23.9	2.4	2.8	18.7	21.1
Turkey	11.0	11.4	1.7	1.9	9.3	9.5
India	5.3	6.0	1.3	1.4	4.0	4.6
Bangladesh	3.7	4.8	0.0	0.0	3.7	4.8
Romania	4.1	4.0	0.3	0.3	3.8	3.7
Tunesia	2.7	2.7	0.1	0.1	2.6	2.6
Marocco	2.3	2.4	0.0	0.0	2.3	2.4
Pakistan	2.0	2.3	0.6	0.7	1.4	1.6
Switzerland	1.4	1.5	0.8	0.9	0.6	0.6
Bulgaria	1.3	1.5	0.2	0.2	1.1	1.3

United States	1.2	1.4	0.8	0.9	0.4	0.5
Korea	1.1	1.0	0.6	0.5	0.5	0.5
Japan	0.5	0.5	0.5	0.5	0.0	0.0

Source: Eurostat (2007)

Market distortions from subsidies

While quota regulations were ended and average tariffs were lowered, markets were still affected by various kinds of subsidies.

Firstly, cotton production was strongly subsidised by the US government, reducing market prices from 0.68 US$ to 0.45 US$ per pound of cotton. This had the effect that the USA remained the second largest producer of cotton in the world and the largest exporter – and accounts for half of the worlds' production subsidies (Allwood et al. 2006). This has strong impacts on the competitive position of developing countries.

Secondly, China, India and Bangladesh are offering assistance to textile producers. China is told to grant 63 different subsidies to its textile companies. India provides a 10% capital subsidy for plant and machinery modernisation. Moreover, a 2.5% reduction on prime lending rates for working capital is awarded. Bangladesh offers a 5% cash grant to its export industries.

These are only some examples for the cost race conducted in international trade. The EU participates with continuous agricultural subsidies and various SME-related programmes.

1.2.6. International competition and relocation of production

China's strength

China is the great winner of restructuring in TCL industries. It became the number one producer of wearing apparel with a share of one quarter of world exports (Perotti-Reille 2008). With labour costs less than one third of the competitors in Europe and the United States, Chinese producers were able to attract rising market shares. The country established regional clusters of textile and clothing production with thousands of firms and millions of employees. These clusters are strongly export oriented. Production chains have been optimised to provide all functions from fibres to garments, confection, and finishing. Rail and sea transport systems have been developed. Hong Kong and Shanghai are functioning as the main trading platforms. Logistic chains were established by companies like Li & Fung (Hong Kong) which organises – through a virtual approach – production and marketing for Western markets.

China's products were at the lower end of the price spectrum for some time. This changed in recent years as China's exports in both textiles and clothing were moving up. Regarding product values, the structure of Chinese textiles exports to Germany has come closer to that of Italy or Poland. Exports of clothing products became similar to those of Belgium, Italy or the Netherlands (OECD 2007). This means that China is on the way to approaching high price markets where European producers – until now – felt to be sheltered. China is moving into more capital intensive and technology intensive product segments and is improving the quality of exported goods. Export strategies are becoming more broadly based and lead to a declining degree of specialisation. Countries like India or Mexico also adjusted their export structures and have taken efforts to improve their competitiveness.

European answers

European producers reacted to the Asian challenge in two ways:

- By *vertical product differentiation*, which means they escaped to high value products. Italy in particular followed such a strategy.[2] Vertical specialisation, however, is a weapon with limited power, as it only works in markets where consumers tend to differentiate across qualities. In

[2] Horizontal specialisation through concentration on fewer products, using economies of scale was used for some time by the emerging exporters like China, India and others.

mass production markets this does not really work. The remaining market volume therefore declines.

- The second choice was to *relocate production to low-cost countries*. This was applied by more and more companies, particularly in high-cost countries. Econometric estimates show that outward investments have a strong negative effect on domestic employment, particularly in branches with strong ties to non-OECD countries. Textiles, clothing and leather/footwear belong to these industries. Increasing relocation also raises the wage elasticity for the long-run and the speed of adjustment of domestic employment. The effects are the contrary in the service sectors. They profit from overseas investments and reduce the speed of adjustment (Molnar et al. 2007).

1.2.7. Specificities of the leather and footwear sectors

Leather and footwear production are in a value chain which is similar to textiles and clothing. The variety of leather products is wide, ranging from footwear to luggage and bags, furniture and upholstery, car and aircraft seats and interiors, and many others. While leather is a product which is widely used, particularly for high-value consumption goods, it is a competitive substitute for other materials like textiles, rubber, and plastics.

The industries are separated into three parts: tanning and dressing of leather, production of luggage, handbags and saddlery, and the production of footwear. Around 563,000 jobs were provided by all three sectors in 2005, 405,000 in the footwear industry, 105,000 in production of luggage, handbags and saddlery, and 54,000 in leather production (tanning and dressing of leather). There are no statistics available on the age and gender profiles of the three industries.

Tanning and dressing of leather

This is one of the very old crafts for the conversion of hide or skin into leather. Production is organised in four production steps:

- Storage of hide and skin and beam house operations: beyond sorting and trimming, the hide is soaked, unhaired, limed, fleshed and split.
- Tanning: the steps are de-liming, bating, pickling and tanning. In the tanning process, the collagen fibre is stabilised by tanning agents.
- Post-tanning: washing and neutralising, retaining, dyeing, fat liquoring and drying.
- Finishing: enhancing the appearance of leather with respect to colour, gloss, handling etc.

The process strongly depends on the natural quality of hides and skins which is excellent in Europe and the Alpine region in particular. This is due to the cattle breeds bred in these regions. Moreover, it depends on the chemicals used for the tanning and finishing processes. Innovation is therefore largely achieved in the chemical industry from new substances with improved characteristics.

A strong focus of innovation is put on environmental protection through waste reduction, recycling, recuperation of chemicals etc. The European REACH regulation, which introduces mandatory registration of substances, will be important for the leather industry as many of the substances used can be expected to belong to the set of critical chemicals. The sector actively supported the solution of environmental problems through a series of technical investigations and the development of new protective technologies (e.g. UNIC 2006).

Production is concentrated on Italy (with a share of 48% in EU27). France and Spain as the succeeding countries have shares between 5% and 10%.

In contrast to other parts of the TCL sector, international trade with raw hides and skins and leather performs well. Exports exceeded imports by 0.5 billion euros in 2005. This, however, was due to the decline of imports rather than the increase of exports in recent years. Goods are imported from Brazil, USA and China while exports go to Romania, China and the USA. Trade flows are affected by footwear manufacturing and other products in these countries. International trade of raw materials is partly regulated which partly leads to shortages on European markets.

Footwear

Shoe production also belongs to the traditional crafts with a long history. Today, however, it is an industrialised product with standardised sizes and highly automated production. Nevertheless, production is made up of a series of production steps, especially for high quality shoes. Innovation is achieved in design rather than technology. Leather is only one of the materials used. Textiles, rubber and plastics are integrated parts of shoe production.

The footwear industry's share of total value added is around 0.5% of the EU25 volume. In countries like Italy, Portugal, Romania, Slovakia, and Spain, the share exceeds 3% of total industrial production and 6% of industrial employment. Two thirds of the total EU footwear production is concentrated in three countries: Italy, Spain and Portugal with Italy producing around 50% of EU production. The industry lost around 4% of its workforce per year over the last 8 years.

During the 2002 to 2005 period, apparent consumption of footwear (measured by the number of pairs) increased strongly by 23%. European producers, however, were only partly able to participate: overall production volume decreased by 29%, while imports increased by 57%. Most of the imports came from China. Nevertheless, one fifth of EU production is sold on external markets and exports could be expanded by 5% over the period. This indicates the strong quality position of EU production (European Commission 2005).

Industrial policies

On 1 July 2007 the European regulation on Registration, Evaluation, Authorisation and Restriction of Chemicals (REACH) came into power. All substances with a production volume of more than one tonne per year has to be registered. For dangerous substances, security studies with exposition scenarios need to be submitted. Their use can be limited or prohibited. Registration is used to intensify the exchange on the effects of substances among producers, importers and distributors. The process can take 20 or more years.

European tanners are affected by trade barriers from two sides: exports of finished leather face various tariffs as countries tend to protect their national leather industries. Moreover, access to raw materials is limited through a restricted supply of hides and skins. Beyond the decline of beef production in Europe, the high price volatility for raw materials created an additional business risk.

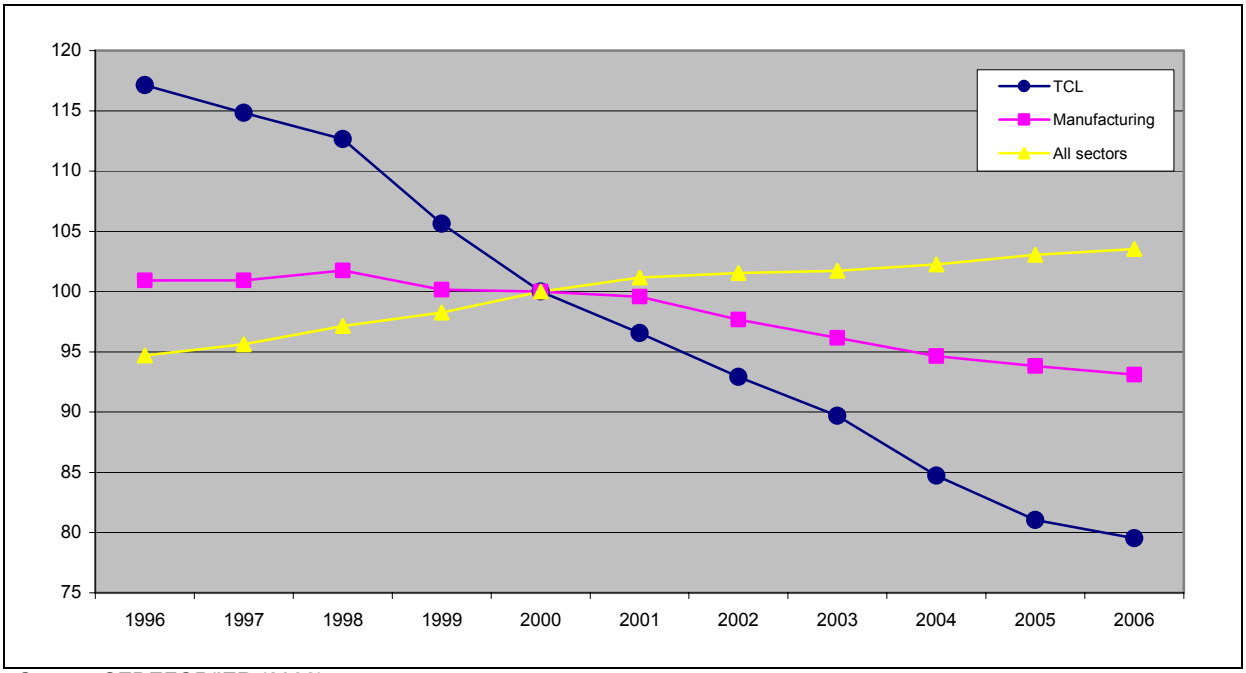
Trade in footwear was liberalised when the last quotas for imports from China ended with the effect that imports increased considerably in 2005.

1.3. Labour demand trends

1.3.1. Total employment

Textiles, clothing and leather/footwear are industries which have been declining for a long time. Since 1996 TCL lost one third of its jobs (Chart 5). Compared to overall manufacturing, the decline of the TCL industries was significantly faster and seems to continue indefensibly (Table A 2).

Chart 5 **Employment trends**
2000 = 100; EU27



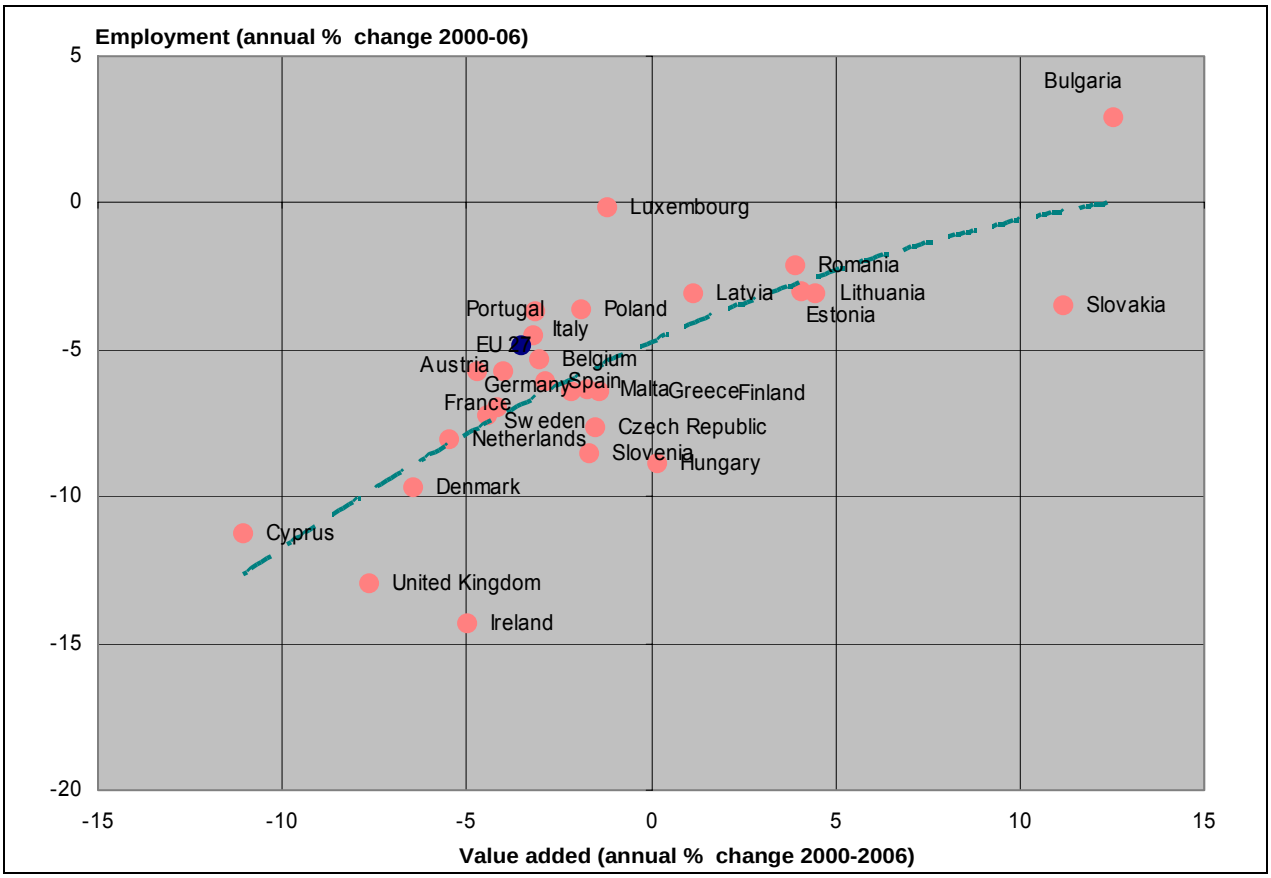
Source: CEDEFOP/IER (2008)

By 2006 TCL industries employed 3 million workers in the EU27 (Table A 2). The biggest employers were Italy with 620,000 TCL jobs, Romania (440,000), Poland (270,000) and Portugal (240,000). Spain followed with 220,000 and Bulgaria with 200,000 jobs. France, Germany and the UK employed between 120,000 and 170,000 people. All other countries had less than 100,000 TCL workers.

None of the EU countries except Bulgaria were able to increase the number of jobs during 2000-2006 (Chart 6). Of the EU27 countries, the TCL sector lost on average 5% of its jobs each year. Ireland, UK, Cyprus and Denmark were among the countries with the most severe employment losses. Italy, Romania, Poland and Portugal all reduced employment by 2% to 5% annually. In France, Germany, and Spain annual losses ranged around 6%. Among the New Member States the Czech Republic and Hungary experienced severe reductions, while the Baltic States and Slovenia were better off.

The comparison with output growth – measured by the % change of value added – reveals that a 12% growth rate is required to achieve minimum stable employment. This intersection of the trend line in Chart 6 does not cut the zero line of employment growth before this level. This is an extraordinary result as the employment threshold at the macro-level usually ranges around 1% to 3%. It can be taken as a further indication of the strong import substitution of TCL manufacturing and the reorganisation of the sector. Value creation is achieved by trade and supply chain management rather than production. These functions take the major part of sales prices – as demonstrated in Section 1.2.3. –thus allowing for the strong productivity rise.

Chart 6 **Productivity trends of TCL industries**
EU27; Average annual growth rates of employment and value added, 2000-2006



Source: Eurostat, Economix

1.3.2. Occupational change

From 2000 to 2006, the change of occupational structures in the textiles, clothing and leather/footwear industries reveals clear trends (Chart 7): In the EU15 countries, the share of managers and professionals increased while production-related occupations decreased together with service and administrative work. Skilled production work was reduced in particular. In contrast, the New Member States increased the number of jobs for skilled production workers and assemblers, while the share of managers, other professionals, service workers and administrative workers was cut.

Data basis:
Eurostat provided additional occupational data for 2007 in December 2008.
Comparisons to data from 2006 showed only minor deviations of the shares of occupational groups. On average, percentage shares changed by 0.3 percentage points between the two years as far as the EU15 and NM10 aggregates are concerned. This is within the sampling error of LFS data. A revision of data presentations, therefore, did not appear to be essential.

This is the continuation of a long-lasting pattern of occupational change which is caused by the specialisation of high-wage countries on know-how-intensive activities while standardised production is shifted to low-wage countries (Vogler-Ludwig 1995). The dominance of this pattern is shown by the fact that all three sub-sectors follow the same type of occupational change (Chart 8). It is most expressed in the clothing industry where management and professional occupations in the EU15 gained even more than in the other two industries. In the leather/footwear industry, the share of unskilled production work increased strongly in the NMS.

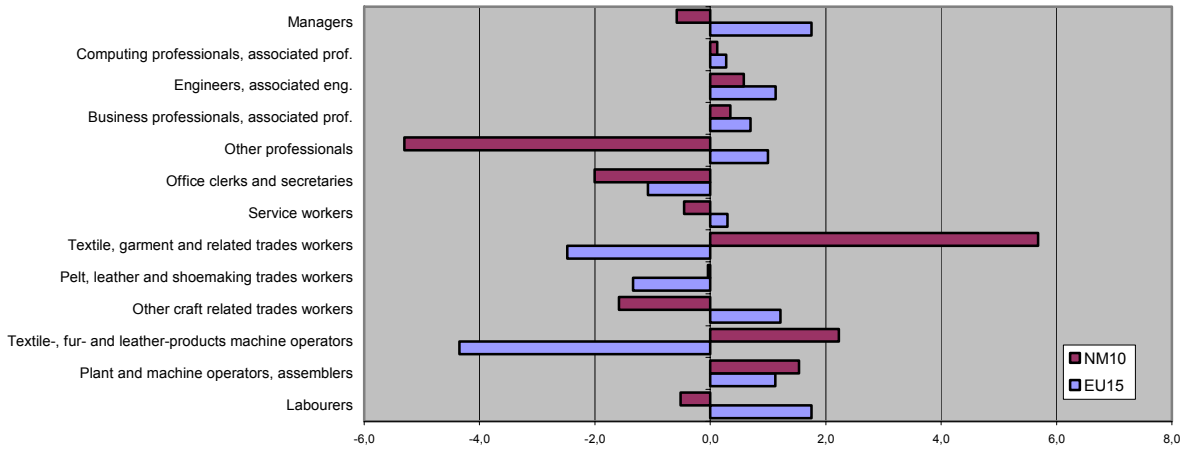
Chart 7 **Employment by occupation and country group: EU27 TCL industries**
Difference of % shares 2006 compared to 2000; ISCO groups
Textiles, clothing and leather/footwear industries*

* Data for Bulgaria and Romania not available.
Source: Eurostat

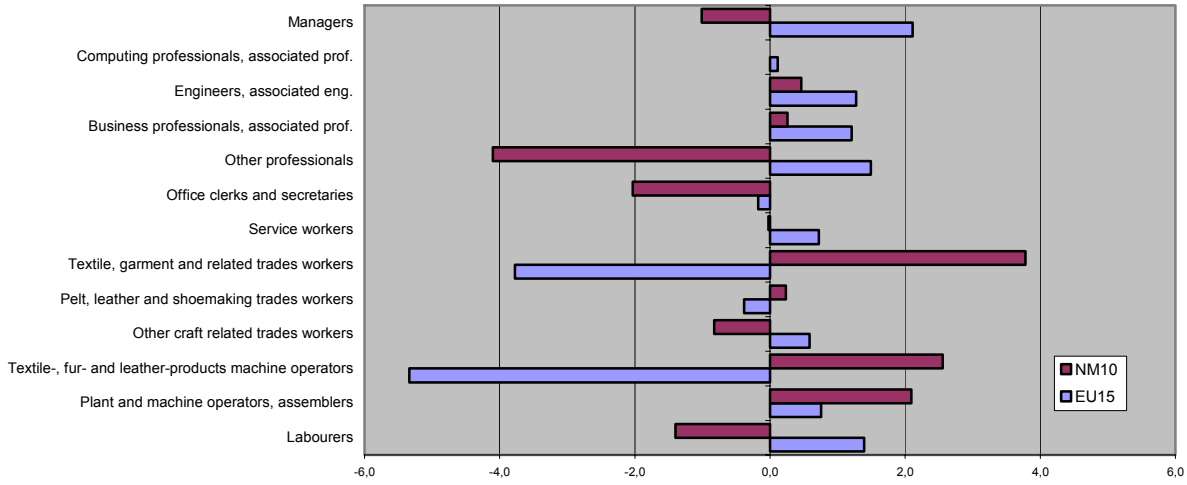
The trends are parallel to the occupational change in manufacturing. In broad terms, the same extent of management and professional activities can be observed in EU15, and a similar concentration on production activities in NM10. One of the striking differences, however, is the observation that the share of engineers grew stronger in overall manufacturing of EU15 than in TCL. The shrinkage of production activities was less explicit.

Chart 8 **Employment by occupation and country group: EU27 TCL sub-sectors**
Difference of % shares 2006 compared to 2000; ISCO groups

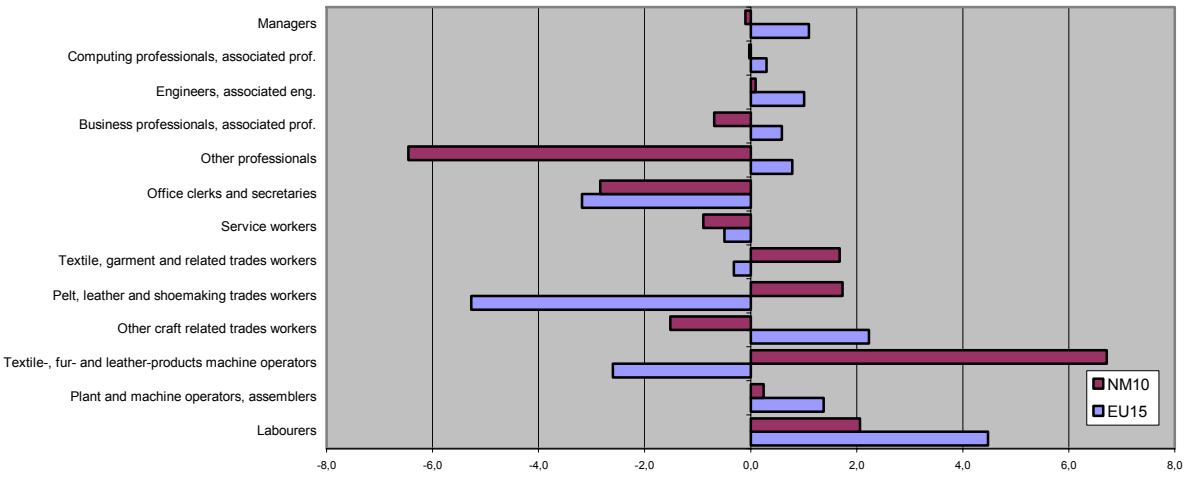
Textiles



Clothing



Leather/footwear



Source: Eurostat

A greater surprise than the principle lines of occupational transition is the fact that changes are developing smoothly rather than radically. In the EU15 countries there was still around 70% of the workforce engaged in production activities in 2006, while 19% were managers and professionals,

and 11% service and administrative workers (Table A 10). The textiles, clothing and leather/footwear industry in these countries, therefore, is production-oriented rather than a service business concentrated on product development, marketing and organisation. Since 2000, not more than 5 percentage points were redirected to know-how-intensive occupations – not very much in face of the dominating production work force.

Occupational change in the NM10 occurs at a similar speed: 5 percentage points were lost in management and professional occupations, and 2.5 percentage points in service and administrative jobs. This was compensated by rising shares of skilled production workers in particular. They gained 6 percentage points since 2000 while unskilled works increased by only 1.5 percentage points.

In face of the Asian challenge, both trends seem to include substantial risks:

- The high share of production workers in the EU15 countries means a big potential for further job cuts due to import-substitution, relocation and increasing capital intensity. As far as these potentials will be exploited, the decline of the industries will not be halted in the near future. Moreover, the redirection of employment into know-how-intensive activities will – by far – not be able to compensate the job losses among production activities.
- The shift of production activities to the New Member States bears the risk that capacities built at present will not sustain global competition. In particular, if companies are not able to create their own products, brands, and marketing strategies then they will remain part of a value chain which is managed elsewhere – the EU15 countries in the forefront. As these value chains are strongly cost-driven, the competition with Asian countries will limit wage increases or even curb growth.

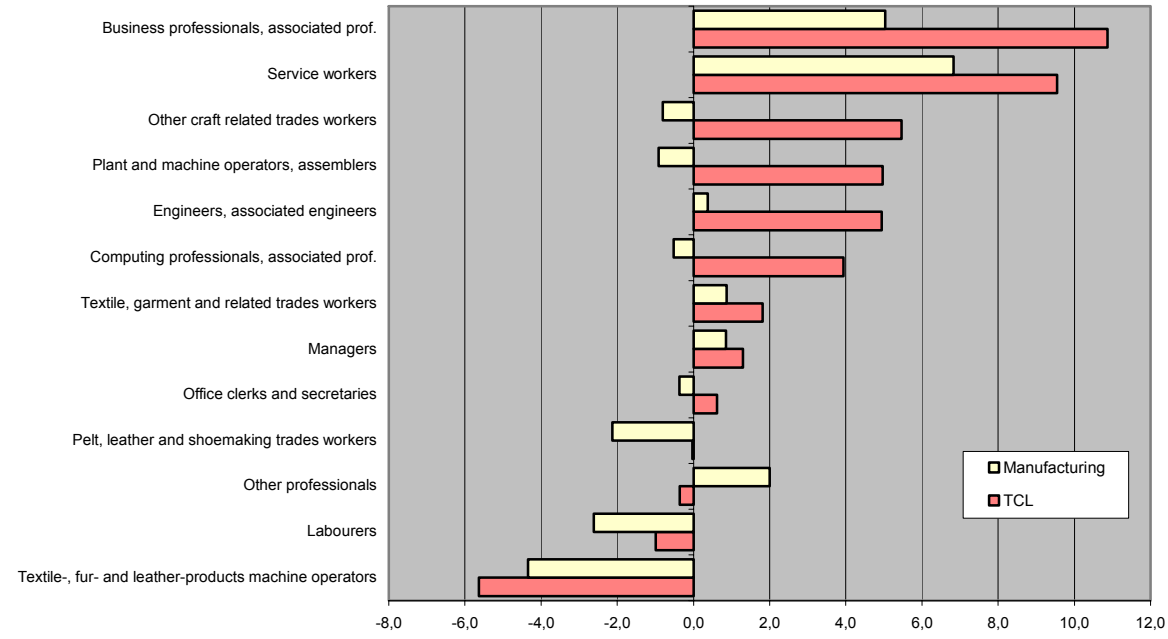
1.3.3. Gender

Traditionally, textiles, clothing and leather/footwear are industries with high shares of females, not only in services and administration but also in production activities. This did not change during 2000 to 2006: 59.2% of all persons employed in TCL in the EU15 region were female in 2006 – slightly less than in the year 2000 (61.3%). In NM10 the share of females is even higher, and increased from 77.7% to 80.4% between 2000 and 2006. Compared to the manufacturing sector, the share of females is more than double in both regions; EU15 and NM10 (Table A 11).

Despite the declining overall share, women succeeded in improving the skills profile of employment in the EU15 countries. Compared to manufacturing, TCL appears to be a leading sector of upgrading female industrial employment (Chart 9). Women lost shares between 2000 and 2006 in only two occupational groups: machine operators for textile, fur and leather products, and labourers. The substantial decline of women's share in these two groups by almost 7 percentage points, however, was largely compensated by rising shares among business professionals, engineers, computer professionals, service workers, craft related workers, and assemblers. These trends indicate the gradual advance of women into skilled jobs in the TCL sector of EU15. In particular, business and service professions are areas where women were successful, but also in technical and computer subjects. Minor advances, however, were achieved in management positions.

Chart 9 **Female employment in EU15**

Difference of %-shares of women 2000 to 2006 by occupational groups; ISCO textiles, clothing and leather/footwear industries

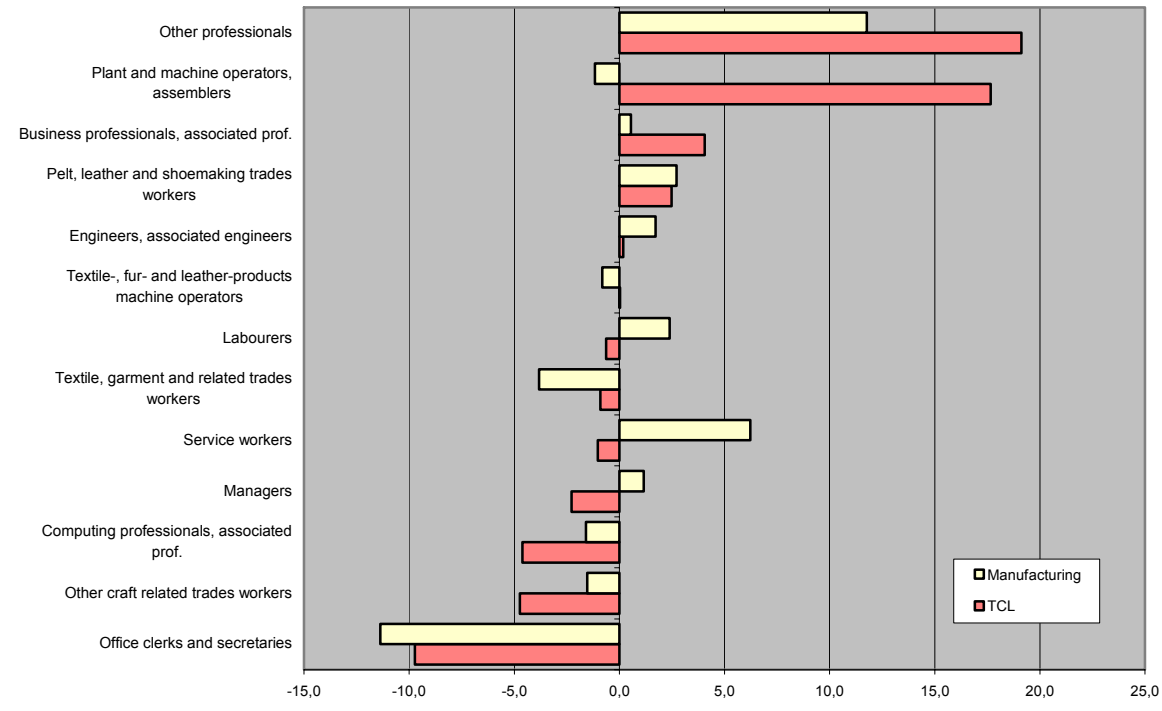


* estimated value for TCL

Source: Eurostat

Chart 10 **Female employment in NM10**

Difference of %-shares of women 2000 to 2006 by occupational groups; ISCO textiles, clothing and leather/footwear industries*



* without Bulgaria and Romania

Source: Eurostat

A different pattern emerges for the New Member States (Chart 10)[3]: the share of females increased rapidly among both "other professionals"[4] and "plant and machine operators, assemblers". The shares among "business professionals" and "pelt leather and shoemaking trade workers" increased slightly. A dichotomous skills development can thus be discerned for women in NM10, obviously leading to increasing shares at the upper and lower end of the skills profile. The upgrading of female jobs – which is so clearly visible in the EU15 countries – is not visible.

1.3.4. Age profile

In EU15 countries, TCL is an ageing sector. A clear shift from the 15-39 age group to older workers happened in the period 2000 to 2006. Younger workers lost 9.3 percentage points while the 40-49 and 50+ groups won 4 to 5 percentage points (Table 7). In NM10 countries, the middle age group (40-49) lost around 4 percentage points while the younger and older attained about 2 percentage points (Table A 12).

In broad terms, the TCL sectors reveal similar changes of age profiles like the manufacturing sectors of the two regions. The ageing of the workforce can also be observed in the manufacturing sector of the EU15 countries, even if it appears to be less pronounced, and the middle generation was able to keep its employment share higher than in the TCL industry. Likewise, the shift towards the younger generation is visible with minor differences in the manufacturing sector of the NM10 countries (Table A 13).

The ageing process in the EU15 countries was particularly pronounced among skilled and unskilled production workers (Chart 11). While younger workers (15-39) took the major burden of job cuts in the TCL industry, the older workers – in particular the 50+ generation – could gain, at least in relative terms. The increase in the group of managers/professionals was mainly at the profit of the middle generation of workers (40-49), while service and administrative jobs shifted to the 50+ age group.

Table 7 Age profile of employment

% share of age groups in total employment by sector; 2000 and 2006

TCL	Year	15-39	40-49	50+	Total
EU15	2000	55.4	24.9	19.7	100.0
	2006	46.0	29.1	24.8	100.0
	Difference	*-9.3*	*4.2*	*5.1*	
NM10	2000	53.9	31.7	14.4	100.0
	2006	55.3	28.4	16.3	100.0
	Difference	*1.5*	*-3.4*	*1.9*	
Manufacturing					
EU15	2000	54.5	25.3	20.3	100.0
	2006	48.8	28.6	22.6	100.0
	Difference	*-5.7*	*3.3*	*2.3*	
NM10	2000	51.1	30.6	18.2	100.0
	2006	53.8	26.3	19.9	100.0
	Difference	*2.7*	*-4.3*	*1.6*	

Source: Eurostat

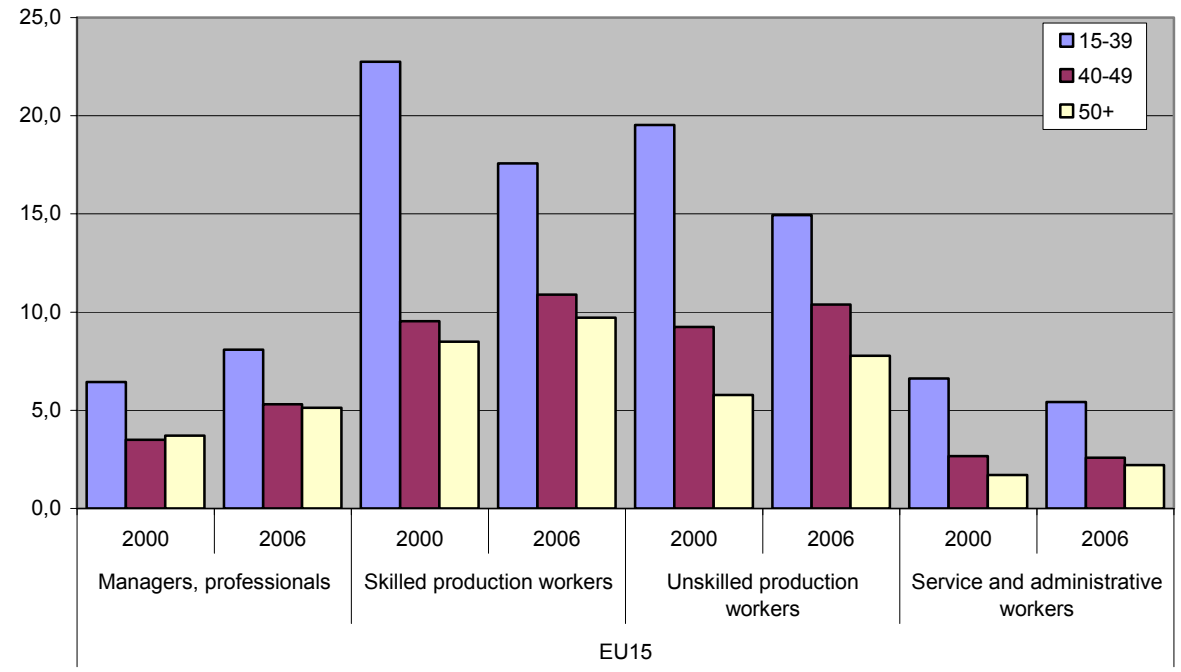
[3] The statistical data basis is limited by the lack of data for Bulgaria and Romania, and the small samples of the LFS in the New Member States. In addition to the imperfect representation of countries, the size of statistical errors remains unknown.

[4] Other professionals are those who are not engineers, computer or business specialists, like natural scientists, designers, artists, teaching staff etc.

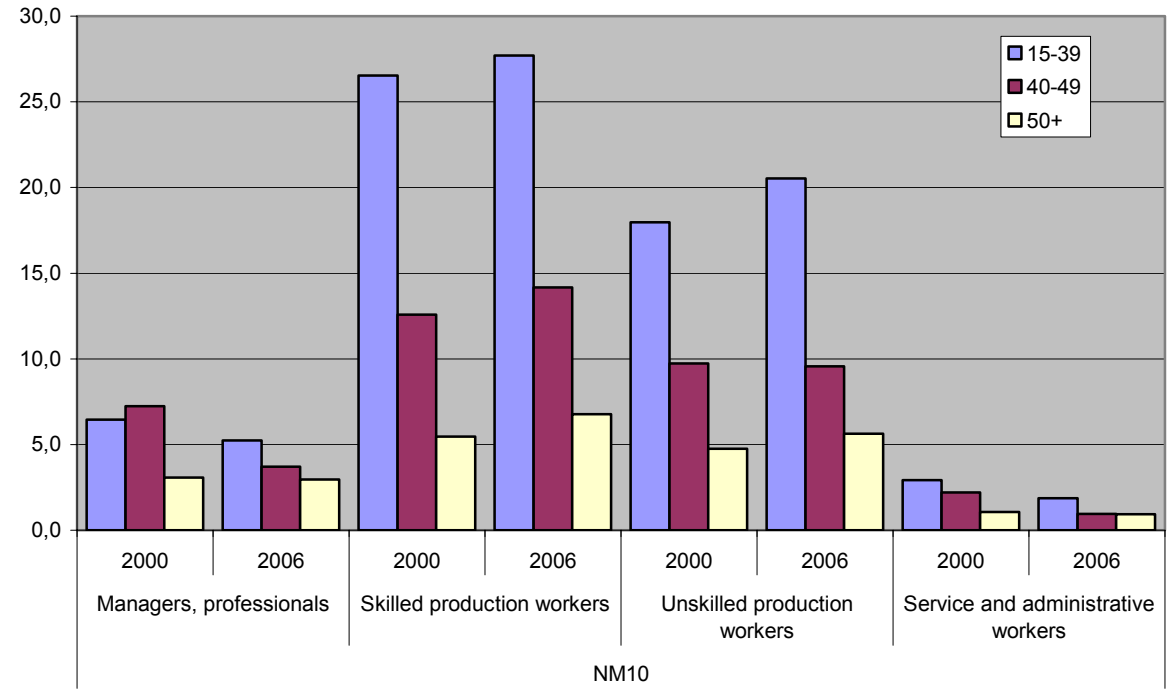
Chart 11 **Age structure of employment by occupational areas**

%-shares of age groups and occupational areas in total employment; 2000 and 2006
Textiles, clothing and leather/footwear industries

EU15



NM10



Source: Eurostat

Among the EU15 countries, ageing of the TCL workforce was very different: while countries like Belgium, Italy, Netherlands, and Portugal have a relatively young work force, many of the other countries have high shares of the 50+ generation (UK, Sweden, Denmark, France, and Germany).

The pattern of change describes the problems of a declining industry. The low level of recruitment mainly affects younger workers while older workers – due to more legal protection and good relations with the management – keep their jobs. This should not be a problem as long as older workers maintain high work efficiency and are able to acquire new knowledge. However, production work with a huge amount of standardised and repetitive tasks makes these learning abilities shrivel (Lindley, Düll 2006).
The age structure of the EU15 TCL industry therefore appears as a risk for future development, regarding the efficiency, innovation and flexibility of companies in particular. It may also be an incentive to further relocation to labour markets with a workforce which is younger than in Western Europe.

Such labour markets seem to exist in the NM10 countries. Among the skilled and unskilled production workers all age groups gained in relative terms, but the younger unskilled workers gained in particular (Chart 11). Between 2000 and 2006 there was a shift of 2.5 percentage points of total TCL employment into this group. None of the other age/skills groups could profit from changes to the same extent.

Restructuring employment was much more at the expense of the middle age group. They lost among managers/professionals and service/administrative workers yet they could win in skilled production work.

The TCL industry in the NM10 countries obviously restructured its workforce considerably, but is also burdened with an ageing problem. This is not the same size as in the EU15 countries, but is evident nevertheless. Countries like Hungary, Czech Republic, Slovakia, Cyprus, and the Baltic States are characterised by an aged work force. Bulgaria, Romania, Poland, and Slovenia in contrast have comparatively young staff.

1.3.5. Formal education

In EU15 countries, a high share of TCL workers (57.6%) only have basic formal education (ISCED 1, 2), one third has a medium level (ISCED 3, 4), and 9.3% have higher education (ISCED 5, 6). In NM10 countries – in contrast – the majority of workers have a medium level (81.1%), and only 13.1% have a low level. 5.8% attained a high level (Table 8, Tables A 9, A 10).

These profiles reflect the different structures of education and training in the EU countries, with a strong training orientation in the former socialist countries. They appear to be very similar to the overall educational profile of the manufacturing workforce in both regions.

The change of these profiles, therefore, is more relevant than the structure itself. Both regions show a strong decline of the TCL workforce with low educational attainment. In EU15 countries the share declined by 5.4% between 2000 and 2006. In NM10 countries the reduction was 6.3%. The difference between the two regions appears in the other two educational groups: while employment in the EU15 countries shifted towards the medium and high levels, the NM10 countries had a strong shift to the medium level, while the high level declined.

This is very much in line with the statistical evidence described before. The EU15 countries restructured their workforce with an upgrading strategy which consisted of rising importance of medium and high educational attainment. In contrast, the NM10 countries concentrated on a medium skill workforce with a high share of production work.

Table 8 Formal education profile of employment
% share of education groups in total employment by sector; 2000 and 2006

TCL	Year	Low	Medium	High	Total
EU15	2000	63.0	29.8	7.2	100.0

	2006	57.6	33.2	9.3	100.0
	Difference	*-5.4*	*3.3*	*2.1*	
NM10	2000	19.4	72.5	8.1	100.0
	2006	13.1	81.1	5.8	100.0
	Difference	*-6.3*	*8.6*	*-2.3*	
Manufacturing					
EU15	2000	58.2	32.0	9.8	100.0
	2006	50.5	36.7	12.7	100.0
	Difference	*-7.7*	*4.8*	*2.9*	
NM10	2000	19.1	72.0	8.9	100.0
	2006	12.9	80.4	6.7	100.0
	Difference	*-6.1*	*8.4*	*-2.2*	

Source: Eurostat

1.4. Excursus: review of forecasts and projections

As an excursus to the development of the scenarios, a review of forecasts and projections is needed. This helps in assessing the scenario outcomes but also provides useful information about potential future trends. The review is not restricted to model-based projections but also includes government plans for China and India in particular.

CEDEFOP/IER skills projection for EU27

Following the CEDEFOP projections undertaken by the Institute for Employment Research (IER) and other research organisations in 2008, the decline of the number of jobs in TCL industries is going to slow-down between 2006 and 2015. The number of persons employed is expected to shrink by 1% annually, compared to job cuts of 3.8% p.a. between 1996 and 2006 (Table 9). This is a considerable deceleration of employment reduction which can also be discerned in manufacturing. In absolute numbers, the projection expects 270,000 jobs to be lost in European TCL industries by 2015.

Table 9 EU27 employment up to 2015

Industry	Persons employed (1000)			Absolute Change (1000)		Annual % change	
	1996	2006	2015	1996-06	2006-15	1996-06	2006-15
TCL sector	**4,409**	**2,993**	**2,724**	**-1,416**	**-270**	**-3.8**	**-1.0**
Manufacturing	37,802	34,871	34,414	-2,931	-457	-0.8	-0.1
Total economy	192,714	210,656	223,936	17,942	13,280	0.9	0.7

Source: CEDEFOP/IER (2008)

Compared to the past ten years, this forecast appears to be an optimistic picture of TCL development. It obviously takes into consideration that a lot of restructuring happened in the sector and the future, therefore, will be different to the past. The figures – as they are understood here – implicitly include the assumption that market conditions have changed: TCL industries will be able to compete with high quality and technology intensive products rather than low prices achieved through standardisation and rapid productivity increase. A larger share of consumers must be expected to prefer nationally produced high quality products. A greater number of producers will be able to defend their market position through brands and fashion products close to national and local consumer tastes. Import substitution will thus be limited. This might also be the result of a deteriorating competitive strength of Asian producers in the course of rapid wage increases, rising energy prices and environmental costs. It may also be related to their (assumed) inability to adjust to changes on European markets.

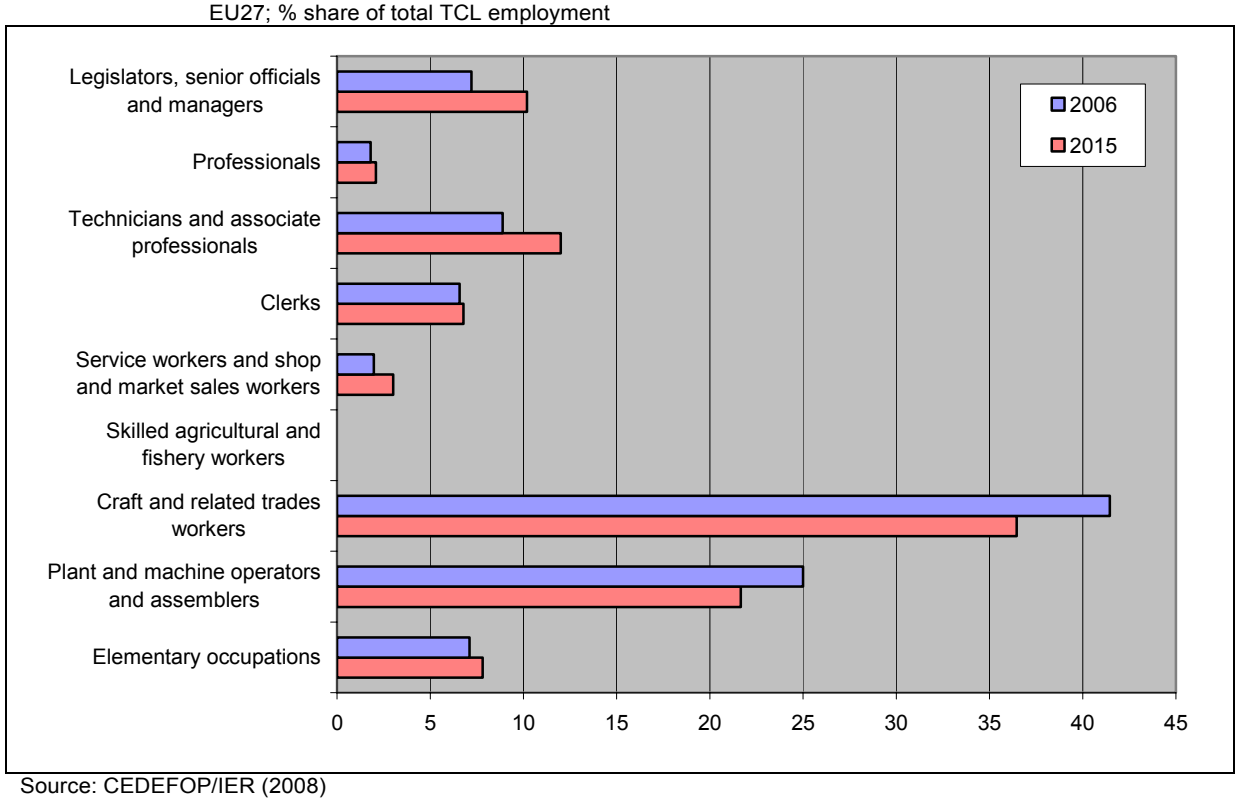
The forecast generally expects a slow-down of employment losses in manufacturing. Only 457,000 jobs will be lost up until 2015, compared to 2.9 million during the ten years before. This underlines the arguments, that European manufacturing might regain at least parts of its former strengths through continuous restructuring and technological innovation. The alternative scenarios presented by the CEDEFOP/IER skills forecast show little variation for the manufacturing sector. Growth rates range between +0.1% and -0.4% annually up to 2015.

Occupational change will continue the major trends of the last ten years (Chart 12). This means a considerable relative expansion of employment in management and professional activities, a minor increase in service and sales-oriented and clerical jobs, and a clear decrease in the share of craft-related jobs, machinery operators and assemblers. Elementary jobs are expected to grow slightly.

These trends are not fully in line with occupational change in manufacturing. The skill forecast expects rising shares of managers, professionals and technicians, but jobs for clerks will decline in relation to total manufacturing employment. The share of craft-related jobs will also rise but machinery operators and assemblers will gain relatively.

Chart 12 TCL employment by occupations 2015

EU27; % share of total TCL employment



Source: CEDEFOP/IER (2008)

EU High-Level Group for the Future of Textiles and Clothing

The vision for 2020 lists a series of mega-trends affecting the future of textiles and clothing industries (High-Level Group for the Future of Textiles and Clothing, 2006):

- rising energy and raw material prices
- scarce water resources
- the critical assessment of the use of chemical substances (REACH)
- the changing awareness of consumers concerning environmental aspects
- changes in retail structures

Summarising these facts, the report states that “In 2006 the textiles and clothing industry is not best placed …” (p. 14). However, the risk of becoming an “industrial desert” can be avoided with

the vision that manufacturing industries will be the driving force of economic change. A horizontal industrial policy is required to support textiles and clothing industries indirectly.

In the course of expanding international trade, European textiles and clothing industries will have to become "leaner and meaner, enjoying higher productivity from a much reduced workforce, with a somewhat greater proportion of its turnover dedicated to exports" (p. 15). The industry will export high quality and high fashion items, and an increasing range of technical items. Companies will reinforce cooperation, "… moving their co-operation forward from mere supplier-customer relationships to more organic links, more focused innovation and development efforts, leading over the period to 2010 to the formation of substantially larger company groups, having the essential critical mass and credible business plans to convince credit institutions … " (p. 16). The chances of standardisation will be used as well as the advantages of specialisation in particular niches.

Technological change will be an important driver of the industries as formulated by the European Technology Platform (EURATEX):

- From commodities to specialty products
- New textile applications
- From mass production to customisation

The recommended strategies refer to:

- regulations which support the industry's competitiveness
- strengthening education and training
- the protection of intellectual property
- regional strategic planning
- research & development
- trade policies

EMCC Scenarios on European textiles and clothing sector

The most recent publication of the European Monitoring Centre on Change of the European Foundation for the Improvement of Living and Working Conditions presented four scenarios on the European textiles and clothing sector (Table 10):

- "Material girl" scenario: a high-tech scenario, in which the textiles and clothing sector is moving into material sciences and research-intensive product areas
- "Express yourself" scenario, driven by design and the awareness of origin. The textiles and clothing industry focuses on providing high-quality products and building up strong brands which cover a wide range of very exclusive products.
- "Stayin' alive" scenario, which describes the crisis and an industry which concentrates on reducing costs.
- "We are the world" scenario: characterised by a focus on sustainability issues – both in terms of protecting the environment and global social responsibility. Corporate social responsibility is a key word.

Table 10 EMCC scenarios

	Material girl	Express yourself	Stayin' alive	We are the world
Output volume	Expanding	Increasing	Strong decline	Rising exports;
Innovation	Strong development of specialty textiles and clothes	Creation of 'micro-brands' Customisation of products; Rapidly changing fashion;	Process rather than product innovation; Cost-saving technologies;	Green technologies: energy-saving, eco-materials, increasing longevity of textiles; Concerns about biotechnology and nanotechnology;
Business strategy	Large companies perform well in combination with research-intensive SMEs. Strategic alliances are important.	More start-ups; Diversification of brands; Large brands less dominating;	Markets are cost-driven; Escape to niche markets; SMEs establish cooperatives;	Low-price strategies; Monitoring of ecological standards; Corporate social responsibility; Export of green technologies;
Value chain and localisation	Proximity between segments guarantees communication and speed of delivery. R&D activities are safeguarded locally.	Proximity is important; Integrated value chains; SMEs are thriving	Most of labour-intensive manufacturing is outsourced;	Proximity is important as consumers prefer European products;
Employment	Increasing	Stable, but a lot of restructuring;	Massive redundancies;	Largely located in Europe.
Skills	Material specialists; Specialists in biotechnologies or nanotechnologies; Electronic service workers; Strategic and innovative managers;	High-skill employment increasing; Designers; Management skills; Marketing and communication; Material specialists;	Global supply chain management; Marketing; A small number of production specialists;	Low and medium skills needed; Technical specialists; Supply chain management with a focus on sustainability, CSR and quality;

Source: EMCC (2008)

USA – BLS occupational forecast

The Bureau of Labour Statistics published its employment outlook 2006-2016 in November 2007 (Figueroa, Woods 2007). According to this occupational forecast, TCL industries are still among the most rapidly declining manufacturing sectors of the US economy. However, the annual rate of decline is expected to decelerate from –8.3% during 1996-2006 to –4.4% between 2006 and 2016 (Table 11). This is supported by the slower output decrease and significantly lower productivity increase. In absolute terms, the forecast indicates that 228,000 jobs will be lost in TCL industries by 2016 while 864,000 jobs were cut from 1996-2006.

The US projection, therefore, has similar expectations to the CEDEFOP/IER skills forecast. The decline of TCL employment is expected to decelerate in future. However, the rates of decline are significantly stronger than it was expected for the EU countries.

Table 11 US output and employment up until 2016
% annual growth rate

2002 NAICS	Industry	Output*		Employment	
		1996-06	2006-16	1996-06	2006-16
313	Textile mills	-4.7	-2.4	-7.8	-3.7
314	Textile product mills	0.4	0.4	-2.9	-1.3
315	Apparel manufacturing	-6.2	-5.5	-10.7	-7.5
316	Leather, leather products and footwear	-6.3	-5.5	-8.8	-6.0
	TCL sector	**-4.2**	**-2.5**	**-8.3**	**-4.4**
	Manufacturing	1.4	2.4	-1.9	-1.1
	Total economy	3.0	2.9	1.1	1.0

* chained year-2000 US $ price deflation

Source: Figueroa, Woods (2007)

China's Five-Year Programme

In its 11th Five-Year Programme (2006-2010) the People's Republic of China targets at a moderated growth of 7.5% p.a. Per capita income should grow 6.6% p.a. to 19,270 CNY (1,815 euro) (Asian Development Bank 2006). The plan reveals a gradual shift of policies towards balanced, equitable and sustainable development. In contrast to the buoyant growth period from 2000 to 2005, the government emphasises restructuring the economy towards services, higher spending on research and development, and longer education periods. Environmental protection plays an important role and should be achieved by, for example, higher energy efficiency, the reduction of water consumption, and the expansion of forest coverage.

As far as these plans are implemented, China is going to change its focus on rapid industrialisation. Three main weaknesses have been addressed:

- The existence of significant overcapacities in some industries (steel, automobiles, cement etc.), induced by investment-oriented incentives. The GDP share of gross investment moved up to 44% in 2005 and caused an unfavourable relation to private consumption.
- The widening income inequalities particularly between rural and urban areas. The relation of 1:3.2 in 2005 indicated the strong incentives for migration to the big Chinese cities.
- The growing threats to the environment.

These challenges will limit the expansion of the manufacturing sector in future and thus lead to a disproportionate growth rate.

TCL industries provided employment for around 12 million people who produced 18% of China's exports. The importance of these industries will continue to be strong over the next decades. However, the changes of the economic and political focus will reduce some of the support provided in the past. Moreover, the rise of environmental costs will burden the industry.

The development guidelines for the Chinese textiles and clothing industry are science and brand oriented (Hongwei Ma 2006). They aim at:

- introducing an overall brand strategy
- modernising equipment and technologies
- fostering innovation through world-wide cooperation
- improving energy saving and environment protecting processes
- strengthening quality control and "industrial self-discipline"

India's Five-Year Plan

Like China, India also set up its 11th Five-Year Plan for 2007-2012 (Government of India 2006). The objectives are to:

- build "world class state-of the art manufacturing capacities to attain a predominant global standing in manufacture of textiles and clothing" (p. XV)
- ensure a growth rate of 16% per annum in the Indian textiles industry and 12% in the clothing industry
- raise exports at a rate of 22% in value terms
- improve the competitiveness of SMEs through innovation, R&D efforts and enhanced productivity
- establish the Indian textiles industry as a producer of internationally competitive value added products

While this appears to be an ambitious plan, the report also refers to the obstacles which need to be overcome:

- The weak technology standards in weaving and processing textiles and the inadequate capacity of domestic machinery producers
- A highly fragmented textiles and clothing industry
- Rigid labour laws
- A substantial skills gap

These are all long-term weaknesses which demand huge restructuring investments. The strategy to achieve the growth targets therefore includes:

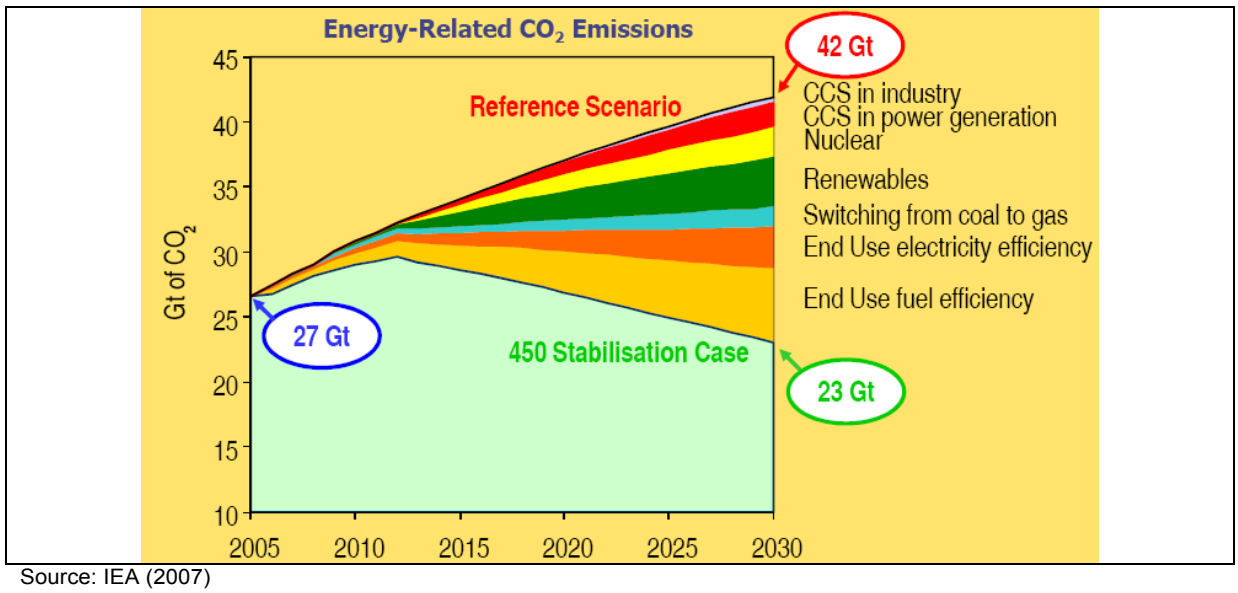
- consolidating the raw material base
- modernising the production equipment
- creating textiles clusters (Scheme of Integrated Textile Parks)
- human resource development by extending training facilities (engineering colleges, polytechnics, and other training institutions)
- labour market reforms (e.g. a substantial increase of working hours)
- attracting foreign direct investment (also from Asian countries)
- brand promotion

It can be questioned whether these instruments can be implemented during the short five-year period of the plan. Growth rates will thus be closer to the 4% annual increase achieved during the preceding planning period.

International Energy Agency

The International Energy Agency presented alternative scenarios on CO_2 emissions at the G8 summit in Germany 2007 (IEA 2007). The reference scenario concludes that worldwide energy-related CO_2 emissions will increase 42 gigatons p.a. if no measures are undertaken. The alternative "450 Stabilisation Scenario" – which assumes significant improvements of end-use energy efficiency, new and more efficient power generators, and more renewable and nuclear power stations – will result in 23 gigatons by 2030. Emission can at least be lowered to present levels again until 2020 (Chart 13).

Chart 13 **Energy-related CO_2 emissions**
Gigatons of CO_2 emissions worldwide per annum



Source: IEA (2007)

2. Main trends of change and drivers (Step 2)

2.1. Principal adjustment strategies

The TCL sector used the economic advantages of international labour division and global trade prior to other industries. Forced by strong price competition and attracted by huge differences of labour cost, the sector relocated production to low-cost countries. This was ameliorated by the worldwide availability of the skills and competences needed for the production of textiles, clothes, leather and footwear. As the process was strongly driven by global retail trade chains, many of the European manufacturers came under pressure but, nevertheless, reacted in very different ways.

Doeringer and Courault (2008) discuss two principal adjustment strategies of garment industries: the I-efficiency (Innovation-efficiency) and the S-efficiency (Sweatshop-efficiency) strategies. These alternative reactions to globalisation were identified by observing the Cholet Garment District in the Pays de Loire in France and the New York City Garment District. Both were traditional clothing production regions which came under strong competitive pressure from the rising competitiveness of Asian countries.

The I-efficiency model is based on entrepreneurial firms and districts which gain productivity and cost advantages from collaborative production relationships, sharing knowledge among local suppliers, and a high level of entrepreneurial activity. Small firms are often the leading actors. The Italian garment districts in the Emilia Romana and Toscana were the first to introduce such collaborative entrepreneurial conduct in the seventies of the last century. This was analysed by various authors like Brusco (1982), Piore and Sabel (1984), and Bigarelli (2000).

Similar solutions were successfully applied in France, facing the decline of mass production through import competition (Doeringer, Courault 2008). By 2003 the French apparel employment was cut to 23% of its 1980 level. Apparel firms closed or downsized. Large manufacturers abandoned production in favour of design and marketing services for products sourced in low-wage countries. A minority of small firms survived by switching from mass production to smaller orders for niche markets, increasing quality and productivity and becoming market-oriented. They took on a much broader range of the supply chain than ever before. Cooperation within the supply chain became collaborative, as opposed to the hierarchical relationships of mass production. This provided the flexibility to serve high-fashion markets with smaller orders. Pooled production ca-

pacities brought the necessary economies of scale. Finally, new brands and retail chains were developed, e.g. for children's wear. This also contributed to regional specialisation.

The S-efficiency model is derived from the more traditional hierarchical contracting practices in the apparel industry in which small manufacturing firms are almost wholly dependent on the larger buyers who provide them with orders. These customers – retailers, manufacturers of branded products or intermediaries such as wholesalers and so-called "Jobbers" – control much of the innovation which occurs within supply chains while leaving contractors to provide largely undifferentiated manufacturing capacities. The survival of these contractors depends critically on performance and costs. Both are achieved from the intensification of sweatshop practices, speed-up in production, and sub-standard pay and working conditions.

The New York City garment district followed this S-efficiency model to resolve the challenges from import competition. It remained within the traditional "Jobber" structure where intermediaries take the task of organising production networks. Typically, these jobbers receive designs and fabric from their customers (retailers, big manufacturers) and contract the cutting and assembling of garments to companies. While the Cholet region destroyed the jobber system, it survived the sharp decline of US production. The New York contractors remained in traditional hierarchical and dependent contracting relationships. They hardly innovated at all, except when their buyers specifically requested new equipment or new services. They have none of the horizontal organisational relationships practised in Cholet or Italy. Contractors remained largely limited to performing the integrated tasks of sewing, pressing, and shipping complete garments to their clients in the shortest time and at the lowest cost (Doeringer, Courault 2008).

Nevertheless, the system survived due to its traditional efficiencies: highly efficient sweatshop practices through minimising waste, achieving a high level of labour division, and drawing fully on agglomeration advantages. Production lines operate at fast speeds and workers are expected to work overtime. The system is flexible and adaptable, largely at the cost of contractors. Paternalistic contracting practices, reciprocal loyalty between jobbers and contractors, and long-term contracting relationships are seen as the main source of efficiencies. In this way it has some parallels to the Japanese Kanban supplier system.

Regarding skills, the two models are strongly different: While the I-efficiency model upgrades skills and earnings, the S-efficiency model refers to low-wage labour, even illegal immigrant labour in the underground districts of New York.

With a more practical and business-related approach the Institut Français de la Mode reviewed the restructuring experience in European TCL industries and identified five principal adjustment strategies (IfM 2007):

- **Brand and design strategies**, which improve competitiveness in high or medium-high price segments. Retailing is a key aspect of the strategy as well as relocating production to low-cost countries. Companies maintain their technical know-how and try to protect intellectual property.
- **Partner strategies,** applied by highly specialised and vertically integrated manufacturers who focus on high quality and reliability. The companies position themselves as industrial partners of their clients (OEM production). Delocalisation is used but is limited due to the need to remain flexible.
- **Industry-retail strategies,** developed by industrial producers integrating retail business. They are located in medium price market segments and use delocalisation as an important option for low costs. Some of them (like Cortefiel) have abandoned production totally.
- **Subcontracting strategies,** applying cost control, quick response and co-development as key success factors. Contractors have neither brands nor retail outlets, working on a B2B basis with customers.
- **Technological leadership strategies,** mainly applied in the textiles sector and the development of technical textiles. Companies have both a strong technological and market orientation. Delocalisation is limited.

Looking to the future, the IFM can see a comprehensive geographical relocation of markets, induced by the strong growth of emerging countries. This will create the need to export skills and competences to these regions. China will experience a significant rise in industrial wages which will alleviate global competitive pressure.

2.2. Rising knowledge intensity

Although TCL is usually classified as a low-tech, low-skilled and labour intensive industry it has been increasingly recognized that the future of European TCL industries will be largely determined by its innovation abilities. Becoming a high-tech industry means not only formal and tangible investment in R&D activities and new technologies, but also a skilled workforce and a close connection with other sources of knowledge, namely external sources. Links to other sciences like chemistry, physics, engineering and medicine appear to be important sources for innovation.

A "knowledge intensity" measure was therefore created for this study, based on a set of diverse indicators and organised by three related dimensions: innovation, employment and human capital, and other knowledge sources using statistical data from EUROSTAT, Community Innovation Survey (CIS) and CEDEFOP/IER (Tables A 5 to A 7).

The results of this analysis can be summarised as follows:

European TCL enterprises of today seem to be as "innovative" and "R&D-engaged" as manufacturing enterprises in general. This is surprising considering the usual ranking of innovative sectors. From a methodological point of view this points to the inadequacy of criteria used to classify manufacturing sectors, their different patterns of innovation, and the broadness of the Community Innovation Survey. Being largely based on managers' opinions about their own company's "innovativeness", this survey appears to be biased and thus classifies TCL industries wrongly. The analysis undertaken here shows that the transition of the European TCL industries towards a knowledge-based industry is already on the way.

Approximately 35% to 50% of TCL enterprises are engaged in product and process innovation. The most innovative countries and sectors in terms of organisational innovation are also the most innovative in terms of marketing. The most important effects of innovation during 2002-2004 were:

- quality improvements
- product and market diversification
- production flexibility and capacity, and costs reduction (the last one being much more important in Spain, France, Italy and Portugal)

Compared to these impacts, regulation demands to reduce environmental impacts or improve health and safety, and "met regulation requirements" are less important among innovative activities.

For companies, the acquisition and installation of machinery, training the workforce, and the process of introducing innovative products to the market contribute a major part of their knowledge base. Other sources such as contact with competitors and other enterprises of the same sector or relations with science and technology systems (S&T) are much less important. Strangely enough, only Portugal shows a quite different behaviour: the most important sources of information for innovation are scientific journals and commercial/technical publications, professional and industrial publications, followed by contact with competitors and other enterprises of the same sector.

In general TCL is not a very collaborative sector in terms of innovation networks. The most cooperating countries are the Nordic countries – Finland and Sweden especially in textiles – using a broad range of networks with other companies (suppliers and competitors), clients and R&D institutions. This also applies to the southern part of Germany. The NMS can also be considered to be collaborative. In Spain, Italy and Portugal, however, the percentage of enterprises with innovation networks was rather small during 2002 and 2004.

Bearing in mind the proposed set of indicators to measure knowledge intensity in TCL, it is possible to define three country groups:

- **High knowledge intensity countries:** Belgium, Germany, Austria, Finland, Sweden and UK which have the highest business expenditure for R&D (BERD), the highest number of R&D workers, the highest percentage of innovative enterprises with R&D engagement (more than 50% of enterprises) and a high proportion of product innovation.
- **Medium knowledge intensity countries:** France, the Netherlands, Spain, Italy, Portugal and Czech Republic, being the second biggest investors in R&D, having a share of 25%-50% of innovative TCL enterprises engaged in R&D, and a clear predominance of process and organisational innovations (some indicators show that France and the Netherlands are closer to the first group of countries).
- **Low knowledge intensity countries:** Bulgaria, Poland, Estonia, Lithuania, Hungary and Romania with a lower BERD and a decreasing trend; a share of less than 25% of "innovative enterprises" and about 20% engagement with in-house R&D (some indicators show that Poland and Estonia are much closer to the second group and, in certain cases, to the first group).

It was also possible to define three sector groups:

- **High knowledge intensity sectors:** textiles – a leading sector in terms of the percentage of "innovators" and "investors in R&D" and showing the highest ratio of R&D workers per enterprise (1.5).
- **Medium knowledge intensity sectors:** tanning – although showing the lowest BERD and R&D personnel ratio.
- **Low knowledge intensity sectors:** wearing apparel – with the least percentage of "innovators" and "R&D engaged" among their enterprises but in second place in terms of BERD and R&D personnel ratio.

In both cases – country and sector comparison – the features which distinguish the most are the percentage of enterprises with innovation activity, engaged in in-house and cooperative R&D, and BERD. For all of them, the textile industry is in the lead and Nordic and Central European countries show a clear advantage. Product and process innovation together with organisational and marketing innovation are also very relevant. They contribute a significant difference between the first group – predominance of product innovation – and the second and third groups where process innovation is predominant. The use of other internal and external knowledge sources such as training, acquisition of technology, introducing innovation to the market and contact with clients and suppliers is very significant in general, and principally the same in all countries and sectors.

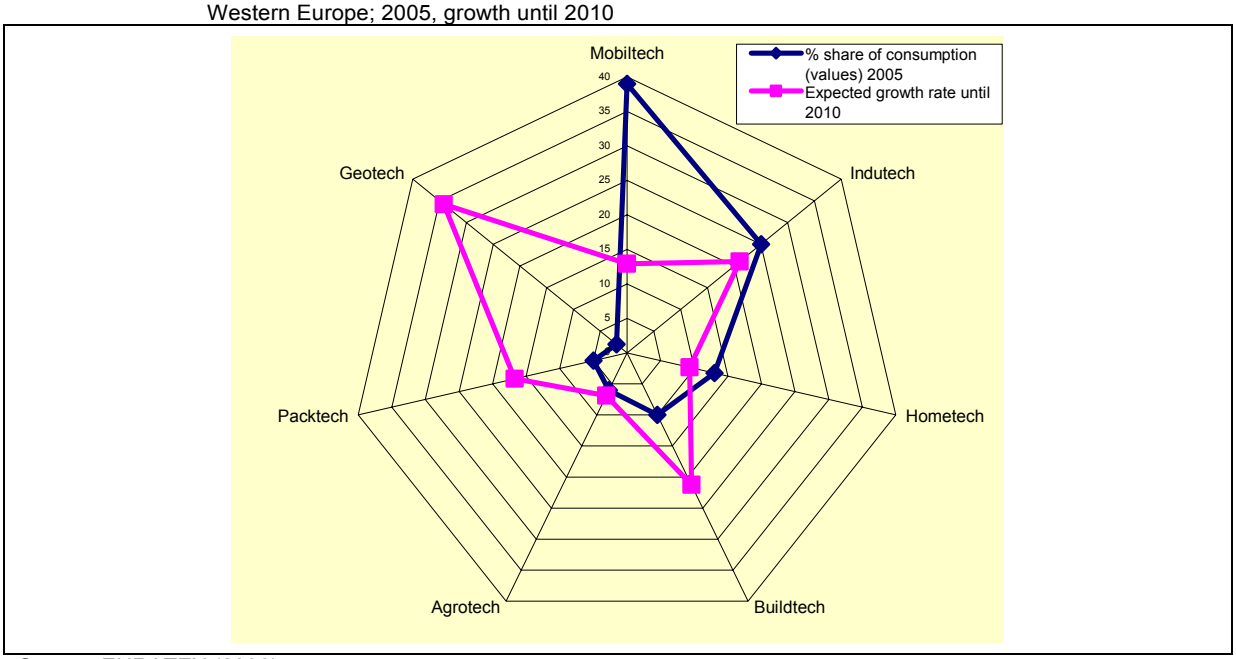
2.3. Areas of innovation

Based on broad research activities from firms and universities, not only a wide range of innovative products have been identified over the last few years but also new areas for the application and integration of textile products. These are in particular:

- *Textile structures* with light-weight roofing, textile-reinforced concrete, fibre-based bridging cables, landslide protection and water management systems, fibre-based flexible piping or artificial islands and floating platforms;
- *Health care textiles* which allow the construction of functional clothing e.g. with strong insulation, water/fire resistance, breathable, wear resistance etc. Smart garments can adapt insulation functions according to temperature changes, detect vital signals from the wearer's body and react to them, change colour or emit light, and accumulate electric energy to power electronic devices. Textiles are used for implants, wound dressings, and prostheses. They are used for functional solutions to treat neurodermatitis, asthma, or to service elderly people.
- In the area of *mobility and energy*, products are developed for the construction of aircraft or rotor wings, body structures, inflatable reservoirs or containers for the transportation of gas, liquids and bulk goods, air bags, flexible solar cells and solar panels. Many of these appliances are based on carbon fibres.

- For *environmental objectives*, natural fibres are developed in order to avoid the pollutant effects of cotton crop growing, and to escape from the scarcity of oil and the price increase of petrol-chemical fibres. Biochemical processes are used to produce these fibres. This is a research area which is still in an early development phase but is expected to be the solution to environmental challenges. New textiles might contribute to that by low water or water-free dyeing, printing and finishing, replacement of chemical by biotechnological processing, or direct 3D forming to reduce the number of cutting and joining steps.
- Concepts for *mass customisation* of clothes are developed and tested. These are based on 3D body scanners and measurement software, single-ply cutters, and internet-based systems which allow consumers, retailers and manufacturers to communicate. Such approaches try to overcome the limits of standardised production through direct and rapid response to customer needs and preferences.

Chart 14 **Specialty textiles: market volumes and expected growth rates**
Western Europe; 2005, growth until 2010



Source: EURATEX (2006)

Following EURATEX, the production of textiles for technical applications in Western Europe is expected to grow by 15% between 2005 and 2010 (Chart 14). The use of textiles for composite products in the field of building and construction, geo-technology, as well as civil engineering will expand considerably (EURATEX 2006).

2.4. Changing the value chain

Traditionally, the textiles and clothing sector's workflow is as follows: production of raw materials, spinning, weaving and finishing by the textiles industry, the manufacture of clothes and home appliances, and the distribution of products in consumer markets by wholesale and retail trade. These are the grey shaded areas in Chart 15.

Chart 16 shows the value chain of the leather and footwear industries which in principle follows the same rationale. However, chemistry plays a dominant role as the supplier of tanning and finishing substances. More than in the textiles clothing chain, the substitution of leather by other products affects the flow.

These value chains – which are still dominating large parts of the industries – are driven by cost efficiency: high standardisation of processes and products, optimal use of international labour division by relocating production, and the use of low-skilled labour at low wages.

Innovation is largely provided through two channels: designers are responsible for final products which are close to consumer tastes and the current fashion, and (mostly European) mechanical engineering companies develop efficient machinery. Particularly the textiles industry relies on highly efficient equipment. Leather industries are strongly related to chemistry.

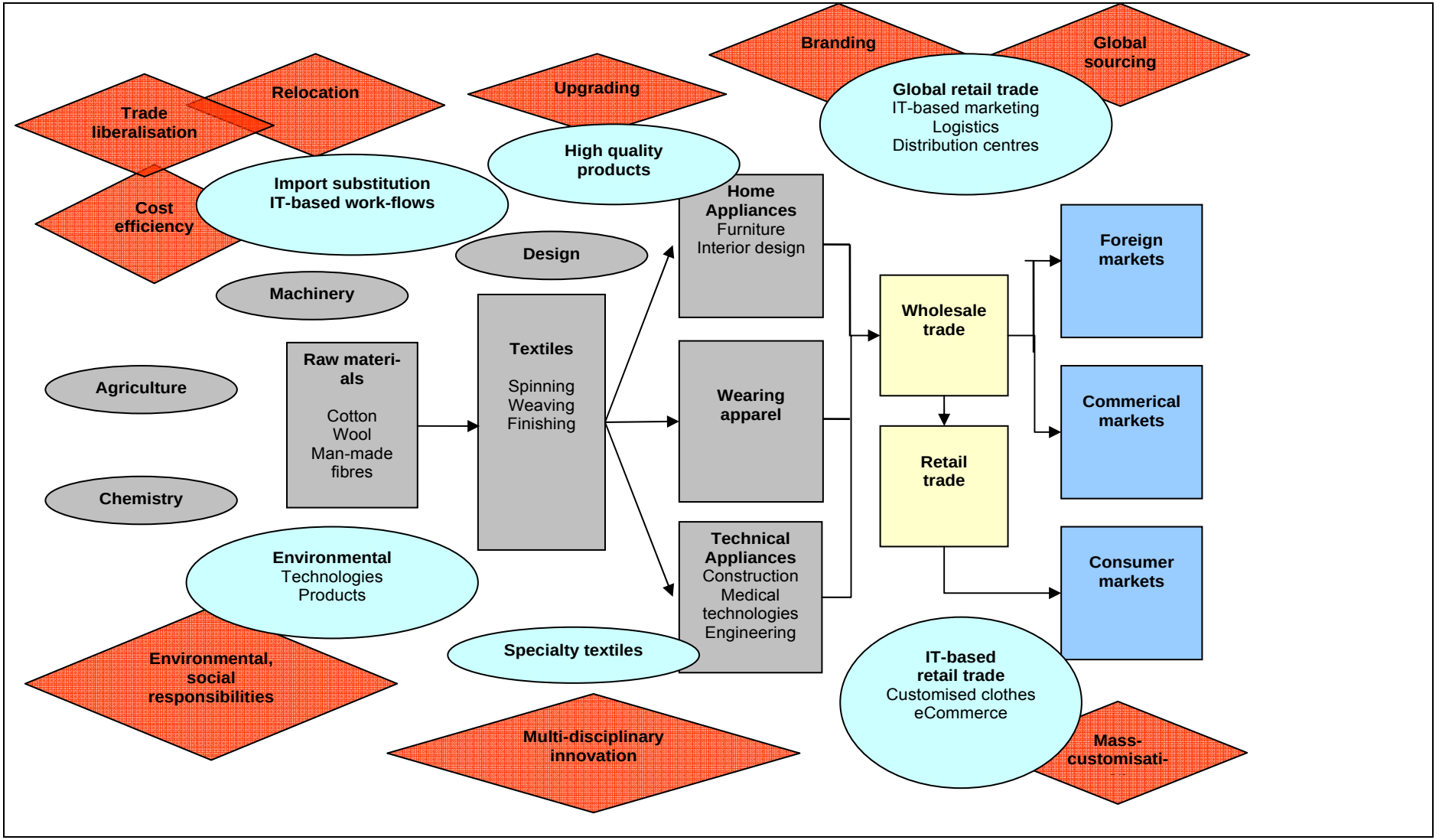
In clothing and footwear manufacturing, however, technical innovation did not play the same role as in textiles. Clothing and footwear, therefore, were the first sectors to move to low-wage countries, as production technology is not very complex, and an increasing number of countries were able to establish industrial production sites. Skills were available in many countries of the world as the tradition of making clothes and shoes is developed everywhere. Based on a productive labour force, production could be made at considerably lower costs than in Europe.

European producers adjusted their strategy mainly by vertical diversification, concentrating on high quality and highly price products. This type of restructuring, however, did not stop the continuous decline of the industries concerning both production and the number of jobs. Moreover, developing countries also made substantial efforts to improve the quality of their products, and create an industrial basis which was less dependent on foreign investment. China and India are the most advanced in this regard. The cost-driven adjustment process of European producers did not solve the problems.

The value chain of today, therefore, is going to be changed by two other major trends:

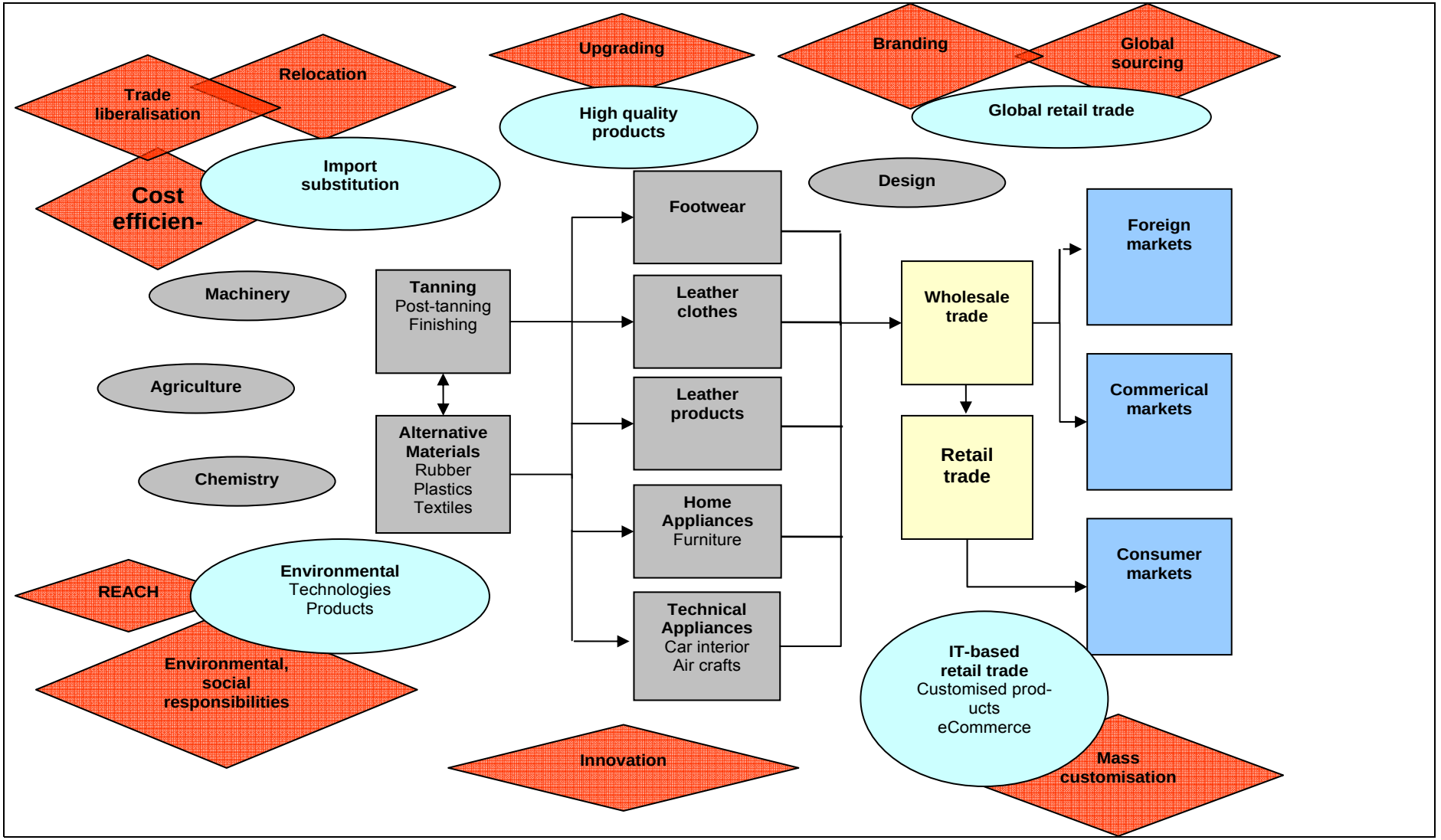
- In particular, the textiles industry is transforming into a provider of technical solutions rather than consumer textiles. It detected a wide range of technical applications of textiles in construction, medical technologies, electronics, and others, which allow it to enter new markets or substitute existing technical solutions with textiles.

Chart 15 Value chain in TCL industries



Source: Economix

Chart 16 Value chain in leather and footwear industries



Source: Economix

The drivers of these innovative developments are not necessarily traditional textile companies but entrants from other disciplines like chemistry, material science, engineering or electronics. The old technology of textile production is combined with modern natural science applications. These developments, which are still in the starting phase, could be able to create new markets but may also displace existing solutions.

- The second trend is the growth of globalised retail trade, as the prominent examples of Hennes & Mauritz, Zara or Cortefiel demonstrated. The incentives for selecting this strategy are shown in Section 1.2.3. (Chart 4). Companies following this strategy are in the low or medium price segments of clothing markets, displacing not only parts of the traditional clothing retail trade but also completely reorganising the value chain. Based on real time sales registration, stocks and flows of merchandise can be continuously observed, optimised and changed. The time chosen when to market is the key to market success. This is possible because producers are linked to the information system of global retailers. Orders can be subdivided into smaller batches as producers are part of the system on long-term contracts. The old seasonal system of production on stocks and reduced sales of overproduction seems to be gone.

The major effect of global retailing is certainly visible on traditional retail trade. However, textiles and clothing producers are also affected as they have to be competitive in low-cost production, flexible regarding batch volumes, colours, sizes, and even the types of clothes. European producers are sometimes at an advantage if the time to market is very important, and transport times from Asia are still considerable.
Another strategy to adjust to the variety of consumer preferences is mass-customisation. By using electronic measurement, the size and shape of clothes can be adjusted individually. This, however, still appears to be rather costly and production times are considerable. Only if these two points are removed, a stronger growth in customised clothes may be possible.

2.5. Energy, emission and global transport – the environmental challenges

The major environmental problems associated with textiles and clothing products are (Allwood 2006):
- Energy use in the production of primary materials (man-made fibres) and yarn manufacturing from natural fibres. Laundry contributes considerably to energy consumption
- Use of toxic chemicals and water resources, in particular in conventional cotton and leather production
- Release of chemicals in waste water, especially in wet pre-treatment, dyeing, finishing and laundry
- Solid waste arising from yarn manufacturing, making up and disposal of finished products

Following the environmental report of the Italian leather industries association UNIC, one square meter of leather requires 113 litres of water. Total environmental cost amounted to 2.2% of turnover. Around 68% are due to water treatment, 24% to waste management and 8% to air emissions and other costs (UNIC 2007).

Regarding occupational health, the main issues of TCL production are:
- Hazardous chemicals in cotton and leather production
- Fibre dust in processing cotton
- Noise associated with spinning, knitting and weaving
- Monotonous repetitive work processes in making up, leading to injuries amongst sewing machinists.

The use of primary energy reveals important differences among selected products which are related to production, but also to the private use of products (Chart 17). Compared to cotton T-Shirts, the viscose-made blouse requires lower temperatures for washing and minimal tumble drying and ironing. This results in half the energy input per item, 54 Mega Joule (MJ), opposed to 112 MJ for a T-Shirt (Allwood 2006). The polyamide tufted carpet requires 390 MJ per square meter, mainly used for material production. The energy profile is similar to the viscose-made

blouse. Transportation has a minor share of total energy consumption for all selected products. Between 3% and 6% of primary energy is used for this purpose.

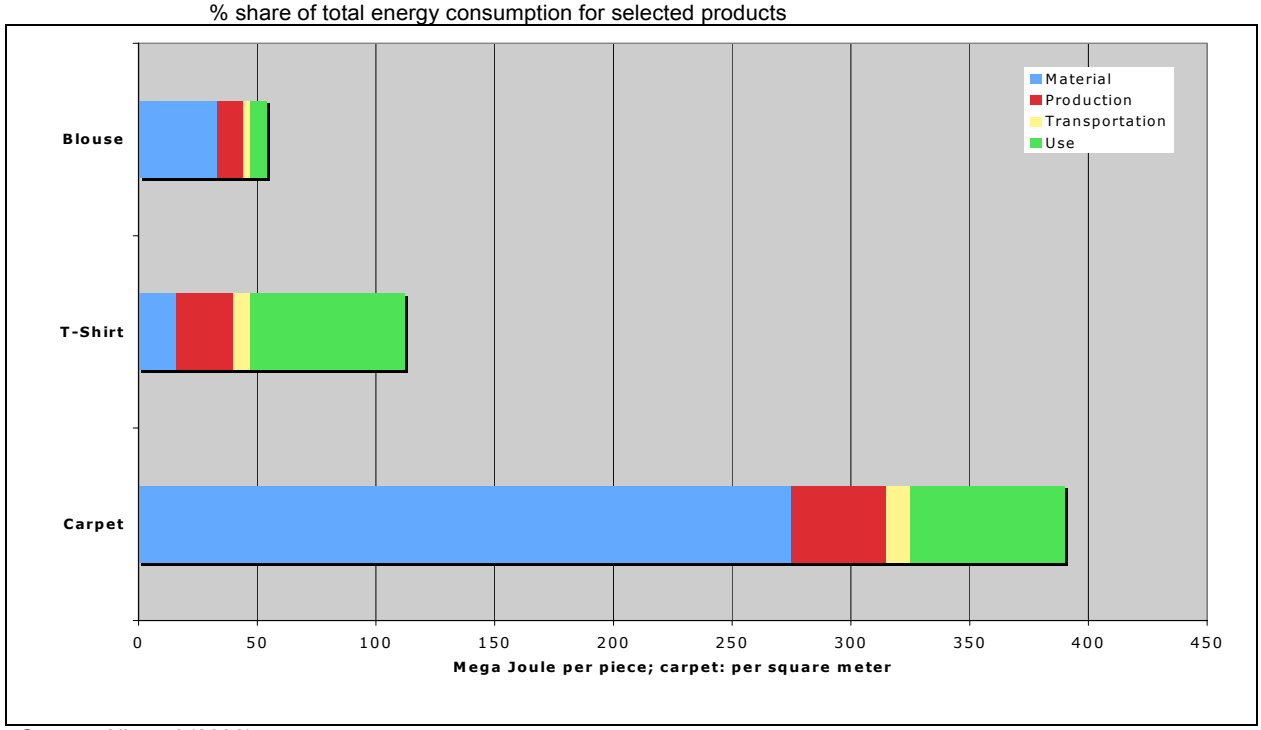
The study from the University of Cambridge on the environmental impact of textiles and clothing production (Allwood 2006) analysed the effects of different alternatives regarding the relocation of production, the change of consumer behaviour, the introduction of new products and technologies, and the change of government decisions on the sector.

It came to the result that:

- Shifting production back to the UK would have relatively little economic benefits but would harm the Asian economies. Without production, the UK is by far the greatest beneficiary as the largest gross profits arise from retail trade rather than production (Section 1.2.3.).
- The use of energy for transportation is relatively small, so shifting the production location would have little environmental effect.
- The extensive use of pesticides in conventional cotton crop growing is a major environmental issue.
- Another dominant environmental impact comes from washing and tumble-drying cotton clothes. Recycling would be useful for synthetic materials. Repair, renewal and recycling would provide a net environmental benefit.
- Substituting natural fibres for synthetic fibres – e.g. the use of hemp – may be a useful move. The environmental impact, however, remains ambiguous.
- The reduction of subsidies would harm US cotton producers.

Chart 17 **Primary energy use**

% share of total energy consumption for selected products



Source: Allwood (2006)

The study shows that a combination of policy measures, new technologies and behavioural changes might reduce environmental damage. Global CO_2 emissions, waste and other emissions could be reduced by 10% to 50%. Consumer behaviour regarding reusing and recycling products appears to be particularly important. All changes lead to higher consumer prices.

The relevance of transportation costs was calculated by a study for the German clothing industry (Chart 18). Using outdoor jackets as an example, production costs in China were estimated to be only 35% of the costs in Germany. Costs in Turkey and Romania were around 63% compared to Germany. The major part of production costs in Germany was labour with a share of 67%, while

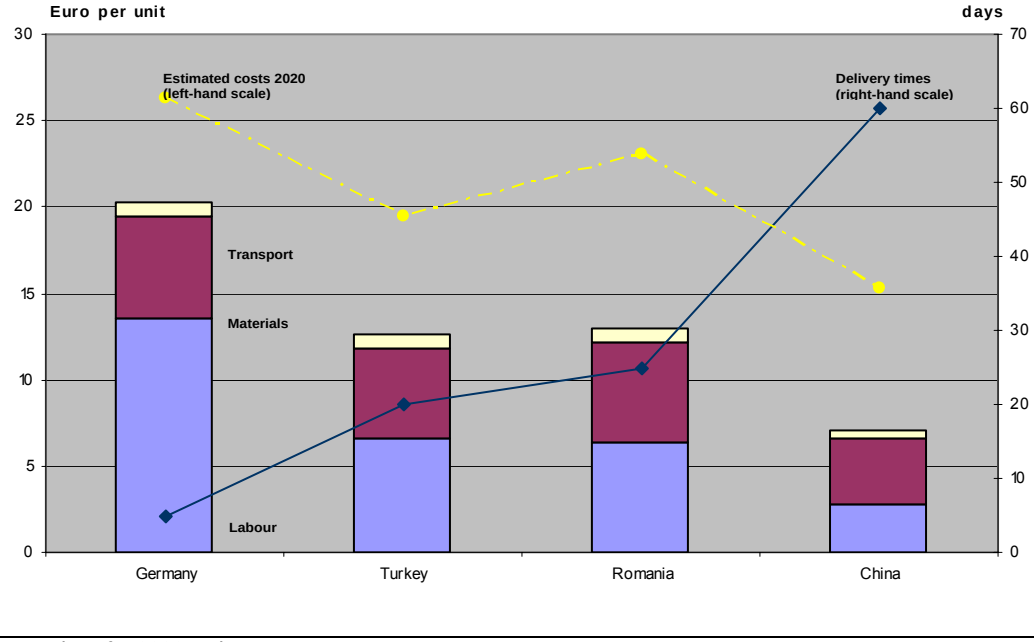
Chinese producers had a wage of only 40%. For material costs it was the opposite: 54% in China and 30% in Germany. Transport costs contributed to only a small part of the overall costs with shares between 4% for German producers and 7% for the Chinese.

The great difference was the delivery time. Chinese products needed 60 days to come to the European market while German products were delivered within 5 days. Turkish producers needed 20 days and Romanian producers needed 25 days.

These cost relations will not change fundamentally until 2020 even if wages and energy prices are expected to rise. Wages, in particular, will affect the outcome. But even assuming a hefty wage increase of 6% p.a. in China – compared to 2% in Germany – will not remove much of the present cost advantage. And even tripling energy prices will not affect the Chinese cost position much, due to the small share of transport costs. Under the assumptions mentioned below, Chinese outdoor jackets will still be available for half the price charged in Germany.

The situation appears to be more dangerous for countries like Romania. If they will not be able to restrict wage increases, their cost position will move close to that of Germany (88% of German costs). This would remove large parts of their present cost advantage.

Chart 18 Production costs and delivery times for outdoor jackets



Assumptions for 2020 estimates:
Wage increase p.a.: Germany 2%, Turkey 3%, Romania 4%, China 6%.
Energy prices: 9.6% p.a., 300% from 2008-2020. Energy prices will affect transport costs and material costs.

Source: Rudolph (2006), Economix

2.6. Strengths and weaknesses of the sector

European TCL industries are split into two parts; the high-cost area which largely comprises the EU15 countries except Portugal and Greece, and the low-cost areas with the New Member States and the two states mentioned. Market conditions, innovation, the competitive position of companies, cost conditions, skills structures and the restructuring process itself strongly differs between these two country groups and thus requires different assessments of strengths and weaknesses[5].

Table 12 Strengths and weaknesses of TCL industries

5 For more details see Section 3.2.

	Strengths	Weaknesses
High-cost areas (1)	• Leading in fashion design and branding • Strong position in top market segments • Good position in specialty textiles • Value chain management • Efficient production networks • Innovative machinery industries • Experienced labour force • Functioning training institutions	• Weak cost position • Weak position in mass markets • Weak attractiveness for young people • Declining training participation • Experience in manufacturing processes is weakening
Low-cost areas (2)	• Competitive wages • Experienced labour force • Proximity to large consumer markets • (partly) new capital stock	• Large-scale production • Weak market position • Weak innovative culture and few brands • Lack of highly skilled professionals (designers, engineers) • Few training institutions • High transport cost
	Opportunities	**Threats**
High-cost areas (1)	• Increasing demand for specialty textiles • Rising worldwide demand for high-level products • Preferences for European fashion style • Strong attendance to environmental issues	• Closing-up of emerging countries in high-value products and specialty textiles • Rising productivity in emerging countries • High price sensitivity of consumers • Disappearance of textiles and clothing machinery producers • Closure of training institutions
Low-cost areas (2)	• Europeanisation of demand • Short-distance transportation • Cost advantages compared to high-cost areas	• Rising cost advantages of emerging countries • Skills shortages due to low attractiveness of the sector • Relocation of production
(1) AT, BE, DK, ES, FI, FR, GE, IE, IT, LU, NL, SE, UK (2) BG, CZ, CY, EE, GR, LT, HU, MT, PO, PT, RO, SL, SV		

Source: Economix

The strengths of high-cost areas in European TCL industries are in three fields:

- They acquired a leading position in fashion design, brands and developed capabilities to manage world-wide value chains based on a good position on consumer markets. This was developed in the course of growing competition from abroad and lead to the specialisation of the industry as marketing specialists rather than producers. Restructuring was based on an experienced labour force and functioning training institutions.
- Parts of the textiles industry specialised in the strongly growing area of “technical” textiles from strong innovative investments. This was fostered by the entrance of non-textile engineering and science into the branch, and the search for new applications for textile products.
- The switch to networks of independent producers with a strong degree of specialisation, own brands and sales channels apart from big retailers, and an innovative approach. The “Italian” model was able provide a solution to the challenges from Asia through specialisation, upgrading and the transition of companies from producers to value chain managers.

The weak points of TCL industries in high-cost areas are evident: the enormous cost disadvantages resulting from wage differentials to Asian competitors, the weakening position in mass-markets and the gradual disappearance of manufacturing processes. The resulting decline of

employment makes the sector less attractive for young people and triggers a vicious circle of declining training participation, weakening human resource capacities, and limited growth potentials.

Low-cost areas profit from cost advantages, the (partly) new capital stock and an experienced labour force. They also take advantage of the proximity to European markets, which is not only a matter of geographical distance. Cultural similarities also play an important role. The "Europeanisation" of demand, which means a rising preference for products made in Europe, would be at their advantage. As long as wage increases remain moderate, low-cost areas will be able to keep their cost-advantages in comparison to high-cost areas. This will attract further production.

On the other hand, large parts of TCL industries in these countries are caught in the S-efficiency model making it dependent on decisions from value chain managers in high-cost countries. Independence, however, is difficult to achieve as the innovative culture is weak, there is a lack of professionals in design, marketing and engineering, and there are few training institutions. Companies therefore do not dispose of independent brands or even marketing channels on European consumer markets. Moreover, their competitive position strongly depends on the progress achieved by the emerging countries. As far as these countries will be able to improve productivity in relative terms and enter medium or even high quality markets, the position of low cost areas in the EU is in danger. A negative trend in production and employment might further deteriorate the position of the sector on labour markets.

3. Emerging competences (Step 3)

As the previous Chapter revealed, competence profiles in the European Union are determined by a series of interfering trends. Moreover, they appear to be different between high-cost and low-cost areas. The following part tries to identify how these trends are going to change skills and competences in different labour functions, looking at those functions which are becoming more important and those which are gradually disappearing. The results are summarised in Table 13.

Skills developments in TCL industries are dominated by

- Development of specialty textiles
- Relocation of production and global sourcing
- Upgrading and branding, particularly in product development and marketing
- Introduction of environmental technologies

Having strong impacts on the skills profiles, these trends nevertheless have partly opposite effects in the two areas of the Europe and affect the sub-sectors of the industry differently.

Technology and application oriented engineering in specialty textiles

The development of specialty textiles leads to a new type of textiles engineer, who is focussed on producing bespoke products for different technological applications in different sectors (construction, health care, mechanical engineering etc.) rather than mass production at low costs but. This requires broad competences in associated sciences like chemistry, physics, electronics etc. Moreover, it needs a good understanding of the application of specialty textiles in the clients' products. Cross-border thinking is a main feature.

This implies significant changes in the production field which switches to smaller batches with higher technology content. Production workers therefore need a good understanding of the more complex processes, quality requirements and customer needs. Skills requirements are therefore increasing in this area.

Marketing and sales workers also need a good understanding of the products and their application by customers. The products which are sold by the producers of specialty textiles have a high technology content which has to be transmitted by sales workers. Increasingly they have the role of mediators between clients and producers. They sell technology based services to their clients rather than standard products. This requires high flexibility and a broad background of specialty textiles' applications.

Management is focussing on change management, in order to achieve the transformation of the companies from cost oriented to technology oriented suppliers. It targets at technological leadership rather than economies of scale. Size is no longer an important criterion. In contrast, management principles are close to the small-sized and quality oriented companies of the textiles industry.

The rising importance of marketing and sales

Strong profit incentives transformed clothing industries into a trading rather than a production business. This is particularly observed in high cost countries. Branding, product upgrading, and the creation of regional production clusters made marketing and sales to a core function of the business which increasingly relies on global production networks. Parts of the industry have been transformed into to trading companies which now employ clothing and textiles specialists.

Marketing receives a new orientation with these developments as it becomes more strategic and market oriented rather than product oriented. Marketing is based on close and updated observation of market trends. It serves heterogeneous customer groups and market segments. It addresses short-term changes of fashion trends on the one hand and long-term brand orientation of consumers on the other. Moreover, it relies on “real-time” IT networks which are able to indicate consumer acceptance of various products rapidly.

Value chain managers on global TCL markets

The relocation of production and the creation of global sourcing systems which happened during the last decades changed the function of clothing engineers from production to management. Engineers are identifying potential suppliers in various countries, supervising production, giving technical and organisational advice, controlling quality standards and arranging logistic services. They require well developed intercultural competences, far beyond language skills. This includes knowledge about the business principles in the supply factories, organisation, labour regulations, political and climatic conditions etc. In particular, it requires a sound understanding of the behavioural and societal customs in the countries.

Relocation of machine operating and assembling functions

While machine operating and assembling functions are gradually disappearing in high cost countries, they are extended in low cost countries of the European Union. This creates a strong segmentation of the skills profiles as shown earlier. Production workers in high cost countries are focussing on high quality products, prototype production, and crafts related trades. The volume of these activities however remains limited and is far from compensating the losses among standard production workers.

Production workers in low cost countries are profiting from this trend. They are mainly engaged in high volume production of standardised products. Production is highly mechanised. Engineering is concentrated on process management rather than product technology. Logistics are important.

The role of companies in low cost countries as suppliers of standard products forced skill profiles into a shape where functions like business management, marketing, design, R&D etc. are underrepresented in comparison to high cost countries. This creates a relevant barrier to escape from the role as suppliers and to create independent brands and marketing channels.

Table 13 Emerging competences

		Textiles	Clothing	Leather
High cost area[1]	**Marketing, sales**	Technology-oriented International High-standard client services	Brand oriented Individualised Rapid change	Brand oriented Quality oriented Ecology oriented
	Engineering,	Small batches	Organisation of value chain	High quality production

	production, logistics	Flexible production Strong customer orientation Sound understanding of processes and quality requirements	Supervision and control International Small batches High quality production	Small batches Craft oriented Environmental protection
	R&D, Design	Interdisciplinary research Application oriented Cross-border thinking	Rapid fashion Customisation of garments High quality fashion	Reduction of water consumption Substances with low pollution
	Management	Change management Technological leadership Quality oriented	Sales oriented Brand oriented Value chain management	Brand oriented Flexible
Low cost area(2)	**Marketing, sales**	Rapid delivery price oriented	Value chain oriented Price oriented domestic markets important	Rapid delivery Price oriented
	Engineering, production, logistics	Efficiency oriented Large scale production Standardiised production	Efficiency oriented Large scale production Standardiised production	Efficiency oriented Large scale production Standardised production
	R&D, Design	Process innovation	Process innovation	Low importance
	Management	Efficiency and price oriented	Efficiency and price oriented	Efficiency and price oriented

(1) AT, BE, DK, ES, FI, FR, GE, IE, IT, LU, NL, SE, UK
(2) BG, CZ, CY, EE, GR, LT, HU, MT, PO, PT, RO, SL, SV

Source: Economix

Rising importance of environmental aspects

Leather industries in particular undertook initiatives to handle environmental aspects of production and consumption of leather products, and to communicate these aspects to the public. The textiles and clothing industries were also active in this respect.

The rising importance of environmental aspects in TCL industries requires the mainstreaming of environmental knowledge at all levels of activities. It starts with production where pollution can be reduced. This however demands for more than changes in production technologies. It involves changes of product characteristics or even the search for alternative materials. The whole value chain is affected. Finally, marketing and sales have to communicate the efforts and achievements in the field.

4. Main drivers of change (Step 4a)

Scenarios can only be developed on the basis of a clear understanding of the mechanism of change. The identification of drivers thus is the most important step in preparing the scenarios. These drivers can be searched in economic, technological, and organisational changes affecting employment and skills structures of the industry. Moreover, political and social trends can be important to explain the changes observed.

Starting with this general task, this section will also explain the principal methodology of how drivers will be identified. Based on a comprehensive list of descriptors – the explaining variables of TCL employment and skills – it will then identify the most important drivers. In order to understand their impact on TCL employment and skills, it will be important to discuss their operation and linkages in detail.

4.1. Principal methodology

The identification of drivers starts with the collection of descriptors which are able to describe important factors for the development of TCL industries, the evolution of employment and skills in particular. These descriptors refer to a wide range of economic, political, and social phenomena.

They do not need to be directly related to the target variables of TCL output, employment and skills. Indirect links are similarly important.

The descriptors are linked by an interdependence matrix which shows the linkages between all the descriptors in four categories:

Value	Meaning
3	Direct dependency
2	Strong indirect dependency
1	Weak indirect dependency
0	No dependency

These categories are applied to all descriptor combinations in a two-sided approach: each descriptor has a value for its *active impact* on each of the other descriptors, and each descriptor has a value for its *passive dependency* on all other descriptors. Usually, lines contain the active values and columns the passive values. Line sums, therefore, give the active sums telling how strongly the descriptor affects all other descriptors. The column sums make the passive sum, which measures the degree of dependency of the descriptor on all other descriptors.

Finally, active and passive sums can be combined in a scatter plot which reveals those descriptors with strong active impacts and weak passive dependencies (Chart 19). These can be included in the set of drivers.

Before undertaking these steps, however, countries will have to be grouped according to their similarities. This will alleviate the discussion on regional disparities and, therefore, is a useful preparatory step for scenario development.

4.2. Classification of countries

Not only for data presentation but also for the development of scenarios, a concise classification of countries appears essential. For this purpose the TCL industries in the EU Member States were categorised along five characteristics:

- *Innovation*, using the evidence of Section 1.4.3.
- *Employment share* of TCL in national manufacturing
- *Company specialisation*, as expressed by the share of companies specialised on specific products in contrast to sub-contracting companies, by companies with independent marketing (e.g. the creation of brands) as opposed to dependent OEM production
- *Training structures,* which mean the existence of vocational training facilities for the intermediary and upper levels
- *Market segment,* which means specialisation of companies on high, medium and low value added products

Table 14 Matrix of similarities between EU Member States
(absolute difference of TCL characteristics between EU Member States)

		BE	AT	FI	GE	IT	SE	FR	NL	UK	DK	ES	IE	PT	BG	CZ	PO	RO	HU	LT	EE	GR	SL
High-cost area	BE	–	1	1	1	1	1	2	2	4	1	3	3	5	9	5	7	9	8	7	7	7	7
	AT		–	0	0	2	0	1	1	3	0	4	2	6	10	6	8	10	9	8	8	8	8
	FI			–	0	2	0	1	1	3	0	4	2	6	10	6	8	10	9	8	8	8	8
	GE				–	2	0	1	1	3	0	4	2	6	10	6	8	10	9	8	8	8	8
	IT					–	2	1	1	5	2	2	4	4	8	4	6	8	7	8	8	8	6
	SE						–	1	1	3	0	4	2	6	10	6	8	10	9	8	8	8	8
	FR							–	0	4	1	3	3	5	9	5	7	9	8	9	9	9	7
	NL								–	4	1	3	3	5	9	5	7	9	8	9	9	9	7
	UK									–	3	3	1	5	7	5	5	7	6	5	5	5	5

	DK										–	4	2	6	10	6	8	10	9	8	8	8	8
	ES											–	2	2	6	2	4	6	5	6	6	6	4
	IE												–	4	8	4	6	8	7	6	6	6	6
Low-cost area	PT													–	4	2	4	4	5	4	4	4	4
	BG														–	4	2	0	1	2	2	2	2
	CZ															–	2	4	3	4	4	4	2
	PO																–	2	1	4	4	4	2
	RO																	–	1	2	2	2	2
	HU																		–	3	3	3	1
	LT																			–	0	0	2
	EE																				–	0	2
	GR																					–	2
	SL																						–

Source: Economix

EU Member States were classified into three categories (high, medium, low) with all five characteristics. From these figures, the similarities of countries were calculated, measured by the absolute difference in the five characteristics among all countries. This index ranges between 0 (indicating total correspondence) and 10 (indicating the maximum difference in all five characteristics). The similarity matrix is given in Table 14 (for details see Table A 16, Data Annex).

Using Austria (AT) as a reference country, this matrix can be read as follows: There is only a difference of 1 between Austria and Belgium (BE) as regards the classification of these two countries over all five characteristics. There is no difference to Finland (FI), but there is the maximum difference of 10 to Bulgaria (BG) and Romania (RO). All other countries can be read in the same way, using the column first and continuing in the row of the reference country.

The matrix reveals a clear picture of classification if the maximum value of 4 is used for the measurement of similarities between countries. The cells which apply to this limit are coloured in yellow – the dark yellow cells indicate the maximum difference of 3. The maximum difference of 4, means that the countries are identical in three of the five characteristics, while in two they differ strongly. This is certainly no strong similarity, but the measurements also have to account for national specificities.

Two groups result from this classification: in principal the old and the New Member States, with the exceptions of Portugal (PT) and Greece (GR) which belong to the second group. For the majority of countries, the similarity index is very clear indicating a strong similarity within the group and differences to the other group.

There are, however, three countries which are on the border between the two groups: Ireland, Spain and Portugal. Ireland shows some similarities with the Czech Republic and Portugal, but the similarities with the countries of the first group prevail. In Spain there are more similarities with the second group but the balance is the same. Portugal fits the least into the two groups. There are similarities with the second group but also with the first group. The overall distance to the second group, however, is smaller.

The countries not included in this comparison are Luxembourg, Slovakia, Malta, Cyprus and Latvia. Luxembourg is counted in the first group and all other countries belong to the second.

4.3. Set of descriptors

Based on the interviews with branch experts and the workshops a list of 28 descriptors was developed (Table 15). These can be sorted into seven major groups:

- **Knowledge base,** including the skills and competences of the existing workforce, the training system, and labour shortages in different occupations.
- **Markets**, comprising the determinants of market development in TCL industries, i.e. income distribution, consumer preferences, demography but also the type of retail channels and sector regulations.
- **Competitiveness and globalisation,** covering its major determinants like product quality, labour costs and productivity, but also the results of competitive relations expressed in the relocation of production to low-cost countries and the competitive position of emerging countries.
- **Foreign trade,** expressed by import shares of emerging countries, and export shares of EU producers world-wide, and the regulation of foreign trade.
- **Branch structures,** characterising regional clusters of TCL producers, contract relations and the size structure of the sectors.
- **Environmental costs,** reflecting energy prices and the costs of climate change.
- **Production and employment,** which belong to the target variables of the scenarios.

Table 15 List of Descriptors

Descriptor	Meaning	Categories
Knowledge base		
TCL skills structure	The structure of total employment in TCL industry regarding broad occupational groups. High-cost countries are characterised by high shares of professionals; low-cost countries by high shares of operators.	• High share of professionals • High share of operators
R&D knowledge	The R&D experience and knowledge of the TCL labour force. This means the ability to create new products, fabrics and materials, apply new technologies and processes, organise production efficiently etc. It does not include immaterial innovation.	• Strong • Weak
Immaterial innovation	Experience and knowledge of the TCL labour force regarding design, marketing of products, branding, and organisation of the value chain.	• Strong • Weak
Training system	The descriptor comprehends general education, intermediary vocational training, and university training, evaluated from the perspective of potential TCL employers. The well developed training system therefore provides the competences which are important for TCL jobs.	• Well developed • Poorly developed
Labour shortage of professionals	Professionals include managers, professionals and specialists. Labour shortage means a lack of sufficient supply of labour in these occupational groups.	• Lack of labour • Sufficient supply
Labour shortage of operators	Operators include skilled manufacturing workers, machine operators, assemblers and labourers. Labour shortage means a lack of sufficient supply of labour in these occupational groups.	• Lack of labour • Sufficient supply
Markets		
Consumer preferences	Preferences of consumers regarding TCL products are classified as brand and quality oriented or price-sensitive. Brand and quality oriented means that the value of products comes from its superior quality and/or a well-known brand. Price-sensitive consumers are less quality-oriented.	• Brand and quality oriented • Price-sensitive
Income distribution	Distribution of disposable incomes among households.	• Wide • Narrow
Demography	Age structure of the population. This is related to consumer preferences.	• Aged • Young
Share of TCL consumption	The share of TCL products in total private consumption describing the overall weight of TCL products for consumers and the relative market volume.	• High • Low
Sector regulation	In addition to EU regulations regarding foreign trade, this refers to environmental protection (e.g. REACH) and other EU regulations affecting production. ESF support and other subsidies are not included.	• Restrictive • Liberal

Market growth in emerging countries	Growth of TCL markets in emerging countries. Emerging countries are China, India and other Asian countries, North Africa, and (for leather) Brazil. The New Member States are not included.	• Strong • Weak

Table 15 continued

Retail channels	The main sales channels for clothing, leather products and footwear. Traditionally, sales are carried out by decentralised and independent retailers. Diversified supply and sales chains operate on a multitude of markets. There are usually two seasons. The big retail chains are based on global sourcing and comprehensive IT structures controlling the whole value chain. This reinforced the shift of production to low-cost countries. Moreover, "rapid fashion" at low costs and short times to market became a strong competitive factor.	• Dominance of decentralised retailers • Dominance of big retail chains
eCommerce	The proliferation of electronic retail trade and direct mailing. This also includes the application of mass-customisation of clothes with the means of electronic measurement.	• Advanced • Less advanced
Competitiveness and globalisation		
Competitiveness of emerging countries	This includes all components of competitiveness, prices, costs, technology, product quality, flexibility and timeliness of deliveries, reputation of producers, brands, market shares etc. It is a relative descriptor measured against the position of EU countries.	• Strong • Weak
Relocation of production	The use of a cost and market oriented relocation strategy by companies. Most of the production was relocated from high-cost to low-cost countries (outward investment); this is particularly expressed in clothing and footwear. Textiles and leather usually followed. The New Member States profited through inward investment.	• Outward investment • Balanced • Inward investment
Labour costs	Labour costs include wages and non-wage labour costs in relation to the EU27 average.	• High • Low
Quality of TCL products	This describes the market segment targeted by companies. In addition to high and low end products, fashionable products are included. These are products with a short life cycle and a medium to low quality level. For high end products the quality of materials and manufacturing is more important than fashion-orientation. For low end products, low sales prices are important.	• High end • Fashionable • Low end
Labour productivity	Output per full-time employee, reflecting not only labour intensity but the efficiency of production capital and organisation of production and logistic processes.	• High • Low
Foreign trade		
Import share of emerging countries	Share of emerging countries in EU imports of TCL products. It reflects all components of competitiveness.	• High • Low
Export share EU producers	Share of EU exports in world-wide TCL exports. It reflects all components of competitiveness.	• High • Low
Branch structure		
Contract relations	The type of contract relations between textiles/clothing-/leather/footwear suppliers and retail trade	• Subcontracting • Independent suppliers
Size structure	The dominance of large-scale producers with integrated value chains (the traditional industrial manufacturer based on economies of scale), opposed to networks of independent SMEs (the Italian model).	• Large-scale producers • Networks of independent SMEs
Cluster type	Knowledge-based clusters optimise the combination of know-how and production efficiency, independently from the location of producers. Regional clusters make use of the regional image for their products and the availability of skilled labour at regional labour markets.	• Knowledge-based • Regional

Table 15 continued

Environmental costs		
Energy prices	All energy sources included.	• High • Low
Climate change	The costs of environmental protection caused by climate damage, including the protection against future damages.	• Strongly rising • Rising
Production and employment		
TCL employment	Total employment in the TCL sector	• Rising • Stagnating • Falling
TCL output	Total value added in the TCL sector	• Rising • Stagnating • Falling

Source: Economix

4.4. Interdependence matrix

The interdependence matrix shows the links between these descriptors using the classification mentioned above. In Table 16 all descriptors are classified and ordered by their active and passive sums. The classification is based on the evidence received from mapping the sector, the information gained through expert interviews, and the debates conducted during the scenario workshops. In addition, the principles of economic theory are included.[6]

The red coloured cells of the matrix indicate the direct links between the descriptors and the orange cells the strong indirect links. Light blue are the weak indirect links and blue signals no interdependency. Due to the ordered presentation of the descriptors, most of the direct and strong indirect links can be found in the upper right hand corner, while weak indirect and non-links are in the lower left hand corner.

This description of interdependencies is based on the present status. It does not include forecasts of how the role of the descriptors will change during the scenario period. The scenarios will, therefore, also consider how the impact of the descriptors (and drivers) will change in the future and which implications will arise from these changes.

6 The matrix nevertheless reflects the theoretical understanding of sector which the authors of this scenario developed. In order to reveal this understanding and open the discussion, the matrix is published in detail.

Table 16 Interdependence matrix

	Rank	28	27	26	25	24	23	22	21	20	19	18	17	16	15	14	13	12	11	10	9	8	7	6	5	4	3	2	1	
Rank	Descriptor	Demography	Energy prices	Climate change	Ecommerce	Income distribution	Labour shortage operators	Sector regulation	Market growth emerging countries	Retail channel	Consumer preferences	Share of TCL consumption	Labour shortage professionals	Training system	Size structure	R&D knowledge	Contract relations	TCL skills structure	Immaterial innovation	Cluster type	Labour productivity	Competitiveness emerging countries	Labour costs	Relocation of production	Quality of TCL products	Import share emerging countries	Export share EU producers	TCL output	TCL employment	Active sum
1	Competitiveness emerging countries	0	1	1	0	1	1	2	3	2	1	1	1	1	2	1	2	1	1	2	2	-	2	3	2	3	3	3	3	45
2	TCL skills structure	0	0	0	0	1	2	1	0	0	1	1	2	2	2	3	1	-	3	3	3	3	3	2	3	2	3	1	2	44
3	Relocation of production	0	1	1	1	1	1	2	3	1	1	0	1	2	2	1	3	1	1	2	1	3	2	-	1	3	3	3	3	44
4	Labour shortage professionals	0	0	0	1	1	1	1	2	1	0	1	-	2	2	2	2	2	2	2	2	2	2	2	3	2	3	2	2	42
5	Labour costs	0	0	0	0	1	2	0	0	1	1	2	2	1	2	1	3	1	1	1	3	3	-	3	1	3	3	2	3	40
6	Retail channel	0	0	1	1	0	1	1	0	-	1	1	1	1	3	2	3	1	2	3	2	1	2	3	2	3	1	2	2	40
7	Consumer preferences	0	1	1	2	0	0	1	1	2	-	3	0	1	2	2	1	1	3	2	1	1	1	2	3	3	2	2	2	40
8	Training system	0	0	0	1	2	1	0	0	0	1	1	3	-	2	2	1	3	2	2	2	3	2	1	2	2	3	1	2	39
9	R&D knowledge	0	0	0	2	1	0	0	1	0	2	1	2	1	1	-	2	2	3	2	2	2	1	1	3	2	3	2	2	38
10	Quality of TCL products	0	0	0	0	0	1	0	2	1	2	2	1	1	1	3	2	2	3	2	1	2	2	1	-	1	3	2	2	37
11	Immaterial innovation	0	0	0	0	0	0	0	1	0	3	2	2	1	1	2	2	2	-	2	2	2	1	1	3	2	3	2	2	36
12	Sector regulation	0	0	0	0	1	0	-	0	2	0	2	1	1	2	1	2	1	1	2	1	3	1	2	1	3	2	3	3	35
13	Market growth in emerging countries	0	1	1	0	1	0	2	-	2	0	0	1	0	1	1	1	1	1	1	1	3	1	3	1	1	3	3	3	33
14	Labour productivity	0	0	0	0	2	2	0		0	0	1	2	1	2	1	1	1	1	2	-	1	3	2	2	1	2	3	2	32
15	Import share of emerging countries	0	0	0	0	0	0	2	2	1	1	1	1	0	1	1	2	1	1	1	1	1	1	2	2	-	1	3	3	29
16	Income distribution	0	0	0	1	-	1	0	0	2	3	2	0	0	1	2	1	1	2	1	1	1	1	2	3	2	0	1	1	29
17	Export share EU producers	0	0	0	0	0	0	2	1	1	0	0	1	2	1	1	1	2	1	2	1	2	1	2	1	1	-	3	3	29
18	Energy prices	0	-	2	2	0	0	2	2	1	0	1	0	0	0	1	1	0	0	1	2	3	1	2	1	3	2	1	1	29
19	Cluster type	0	0	0	1	0	0	0	0	0	0	0	1	2	2	2	1	2	2	-	2	1	1	1	2	0	1	1	1	23
20	Demography	-	0	0	1	1	1	0	0	1	3	2	1	2	0	1	0	1	1	0	0	0	1	1	2	1	0	1	1	22
21	Ecommerce	0	0	1	-	0	0	0	1	1	1	1	1	0	1	1	1	1	1	1	0	1	1	1	1	2	1	1	1	21
22	Share of TCL consumption	0	0	0	1	0	1	0	0	1	1	-	1	1	1	1	0	1	1	1	0	0	1	1	1	1	1	2	2	20
23	Contract relations	0	0	0	1	0	0	0	0	0	0	0	0	2	1	2	-	1	2	1	1	0	2	1	2	0	1	1	1	19
24	Labour shortage operators	0	0	0	0	1	-	0	0	0	0	0	0	2	1	0	0	2	0	0	2	1	2	2	0	2	1	1	1	18
25	Size structure	0	0	0	0	0	0	0	0	0	1	0	1	2	-	0	2	2	1	1	2	0	1	1	0	0	1	1	1	17
26	TCL employment	0	0	0	0	1	2	1	0	0	0	0	2	2	0	0	0	1	0	0	1	0	3	0	0	0	1	2	-	16
27	TCL output	0	0	0	0	1	1	1	0	0	0	1	1	2	0	0	0	1	0	0	2	0	2	0	0	0	1	-	3	16
28	Climate change	0	3	-	1	0	0	1	0	0	0	0	0	0	0	1	0	0	0	1	0	1	1	1	1	1	1	1	1	15
	Passive sum	0	7	8	16	16	18	19	19	20	23	26	29	32	34	35	35	35	36	38	38	40	42	43	43	44	49	50	53	

Classification categories: 3 = direct dependency; 2 = strong indirect dependency; 1 = weak indirect dependency; 0 = no dependency;

Source: Economix

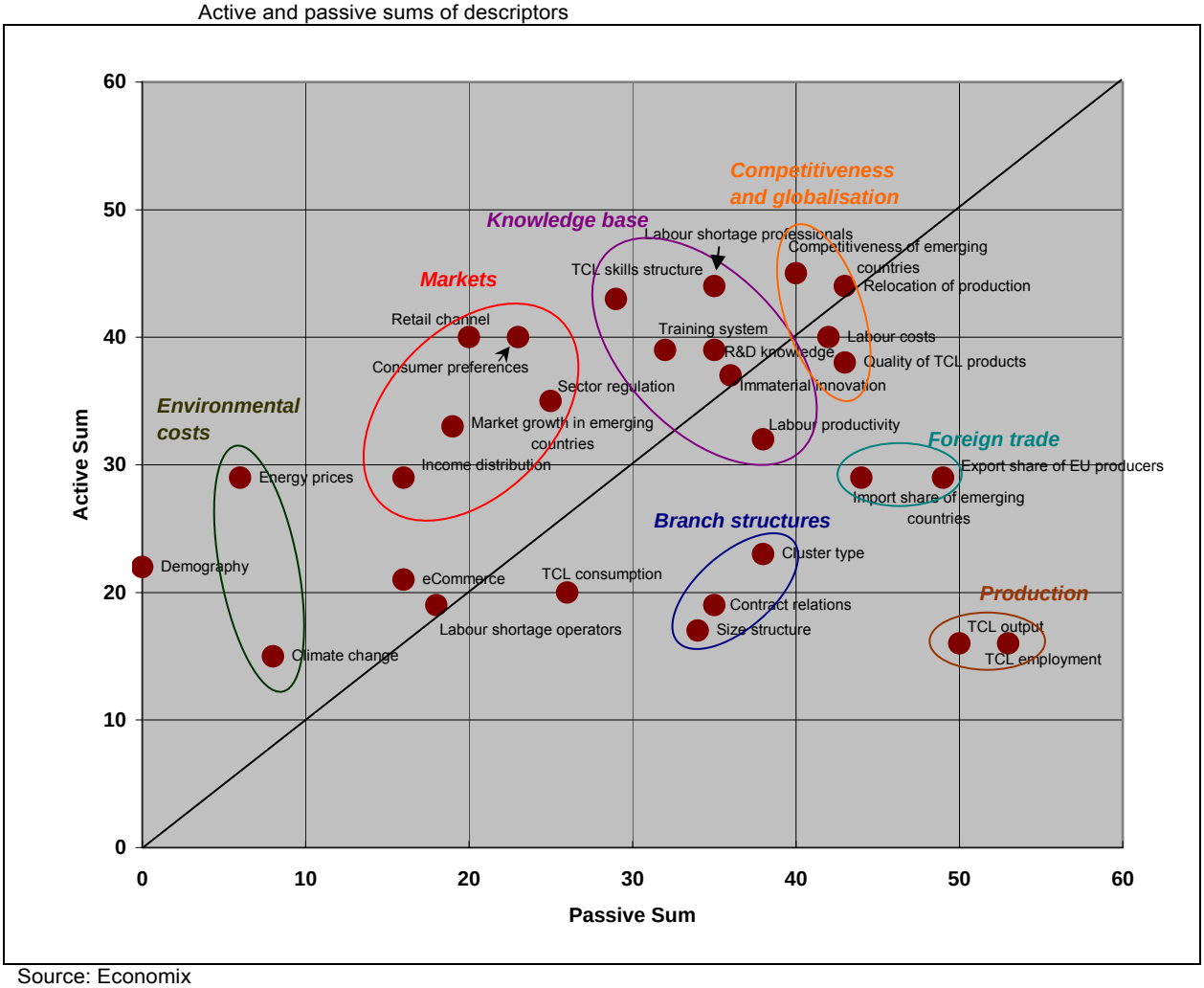
4.5. The drivers

The comparison of active and passive sums of the interdependency matrix reveals the importance of descriptors in the explanatory scheme (Chart 19). In brief, TCL industries are strongly driven by:

- the competitiveness of companies and globalisation trends
- the knowledge base available on home labour markets
- market dynamics
- energy prices and the costs of climate change

Compared to these groups of drivers, branch structures, the performance of foreign trade, and TCL output and employment are factors which are driven by the other determinants rather than being drivers themselves.

Chart 19 Drivers
Active and passive sums of descriptors



Source: Economix

This perspective certainly differs from the usual econometric approach, which takes output and employment first in order to explain skills. From such a macro-to-micro view the structures of markets and sectors result in changes in prices, labour costs, capital stocks, technological progress etc. The micro-to-macro perspective applied here derives output and employment from market conditions, the quality of the production base – the knowledge base in particular – and from basic strategic choices of employers, workers and policy makers. This turns the usual approach upside down – trying to find the determinants of future developments in structural conditions rather than in operational conditions.

4.5.1. Autonomous drivers

Only very few of the descriptors appear to be autonomous. Demographic changes and environmental costs are those which do not appear to be affected by many of the other factors. This is expressed by their low passive sums. It means that – within the time horizon of this scenario – TCL industries and markets have no impact on demographic changes and do not affect energy prices. The effects that better clothes have on health or the environmental effects of TCL production are too small to be considered explicitly.

In contrast, however, these factors affect TCL industries in various ways: demography is changing consumer preferences, in particular if the age structure of the population or the number of migrants is changing. In these ways demography affects the share of TCL products in consumption and the quality of products demanded and produced in Europe. Moreover, it has an impact on the size and structure of training systems.

Energy prices and environmental costs (the costs of climate change) are actually strongly upgraded in their active role among the drivers. This is explained in more detail in Section 3.5.5.

4.5.2. Globalisation trends and the competitiveness of emerging countries

The rising competitiveness of Asian producers and other low-cost countries has determined TCL performance for decades and can now be expected to become fully effective under the regime of a largely liberalised European trade. This induced the strong rise of imports from these countries associated with exports of textiles, leather and other material components of apparel production.

Most importantly, all segments of the TCL sector relocated production to low-cost countries. Low-cost products largely disappeared from the production list in high-cost countries. Cost advantages were so attractive that even top quality products were manufactured abroad.

Two groups of countries profited from these facts; the Asian countries (China, India, Vietnam and others) and the New Member States. Substantial production facilities were established in these countries with the help of (largely European) machine tool manufacturers.

Substantial knowledge transfer was accomplished with relocation, reinforced by the weak protection of intellectual property, particularly in China. This contributed to the creation of competitive industries in these countries.

Relocation contributed to the rise of imports of the EU through outward processing. Partly, European textiles industries were positively affected by rising exports. In general, however, textiles industries and components industries followed the clothing industries to the new locations. For the leather-footwear chain this was different due to the strong position of the European leather industries. The relocation of footwear industries contributed to the positive trade balance of leather industries in Europe.

Relocation was not only associated with substantial employment losses in EU high-cost countries, but also with considerable shifts of skills structures. The share of machine operators and assemblers decreased sharply in high-cost countries while it increased in low-cost countries. In parallel, the share of technical specialists, business professionals and managers increased in high-cost countries while it decreased or stagnated in low-cost countries.

4.5.3. Knowledge base

In many of the interviews conducted for this study, the interview partners reported on significant labour shortages in TCL industries. Even countries with high unemployment rates seem to suffer from these problems.

This was mainly addressed to low wages paid by the sector in comparison to other sectors. In many countries TCL wages are at the lower end of wage rankings. A second impact comes from decreasing employment in the TCL sector. Poor employment prospects do not attract job applicants who see better alternatives in other branches. This created considerable recruitment problems as well-educated and skilled workers preferred other sectors with higher wages and better job perspectives. Skills shortages of professionals were particularly induced by this fact.

The lack of qualified staff affects a wide range of the business from the quality of products to innovation, from labour productivity to management, from export performance to relocating production. The deterioration of the knowledge base, therefore, starts a vicious circle: Some of the training centres visited during this study reported on decreasing numbers of students, training centre closures, and increasing difficulties in finding the financial resources for modern training. In parts of the New Member States, training structures were destroyed without replacing them with updated training institutions.

Fortunately, there are other stories to be reported: The analysis of innovation activities in the European TCL industries provided evidence that companies have fostered their innovative efforts. Meanwhile, many countries have achieved a comparable position to the average of manufacturing (Section 1.4.3.). This is promoted by the transition of textile companies to producers of specialty textiles and the specialisation of high-value segments which generally require more R&D investments. Moreover, the process is promoted by the entry of specialists from other sciences (chemistry, material science, electronics etc.) which apply textile technologies for the production of a wide range of special products. As a result of these changes the number of students in German textiles and apparel engineering studies has almost doubled since 2001. The representatives of the University of Reutlingen confirmed this trend in their Textiles and Wearing Apparel Department. The innovative strength of the European TCL sector, therefore, does not seem to be lost.

4.5.4. Market dynamics

Most of the market related descriptors are both highly active and autonomous. This means that these factors have a strong impact on TCL industries, but not all of them can be governed.

As described in Section 1.4.4., the emergence of global retailers has had the most important impact on TCL industries. The retail chains were those who took advantage of favourable profit rates in clothing retail trade and the strong price competition among producers worldwide. This accelerated the globalisation of TCL production and contributed to the decline of European output. In particular, it had strong effects on output structures as European producers lost most of their low and medium quality market shares – at least in high-cost regions. Producers in the New Member States are under strong competitive pressure from Asia.

The income distribution has significant effects on the structure of TCL markets: a wide income distribution extends markets for both high-end and low-end qualities, and a narrow income distribution extends demand for medium qualities. The income distribution affects consumer preferences and – indirectly – R&D investments and immaterial innovation. Compared to other drivers the effect of changing income distribution, however, appears to be moderate.

Consumer preferences have a more active role. The fact that global retailers are observing consumer choices through data mining, and “trend scouts” underline that they strongly depend on changes in consumer markets without being able to predict these changes in the longer term. While mass consumer behaviour is dominated by high price sensitivity, it is reported that a rising share of consumers are demanding ecologically and socially acceptable products.

Sector regulation became less important with the removal of European import quotas. However, environmental regulations (REACH) are becoming more and more important.

Being a strongly export-oriented sector, TCL sales are determined by the growth of the major export countries. Among these, the emerging (Asian) countries are becoming more and more relevant as income and wealth is increasing rapidly. Mass consumer markets in these countries are, however, hardly accessible to European producers due to cost and wage differentials. Thus, only top qualities are sold in these countries.

4.5.5. Energy prices and the costs of climate change

Energy prices affect the competitive position of emerging countries due to the long-distance transportation to Europe. In addition, market growth in emerging countries is slowed down by rising energy prices – and European countries are shocked likewise. Thus, exports from European producers also experience a negative impact. Moreover, rising energy prices encourage investments in energy-efficient machinery or even the substitution of energy consuming capital by labour. It also fosters the application of e-commerce.

In contrast to the energy price increase, the costs of climate change are not fully visible at present. This is the reason why it has the lowest active sum among all descriptors. However, this position can be expected to change radically during the time horizon of the scenarios. Climate damages will raise environmental costs, and the need to protect the population and the economy from future damages will multiply these amounts. Insurance premiums for climate-related risks (particularly for buildings and infrastructure) will rise considerably. Through these channels, the external costs of energy consumption during the past decades will be internalised and will burden future developments.

For this reason, climate change is one of the most important drivers of the scenarios developed in Section 4. The way in which climate change is addressed by politics determines the alternatives for world-wide growth and international trade. TCL industries will thus be seriously affected.

5. Three scenarios up to 2020 (Step 4b)

After this long walk through statistical evidence, research findings and public statements, this section finally develops the scenarios for the textiles, clothing and leather industries in the European Union. The time perspective is 2020 – not really a long-term view but long enough to take the big issues in.

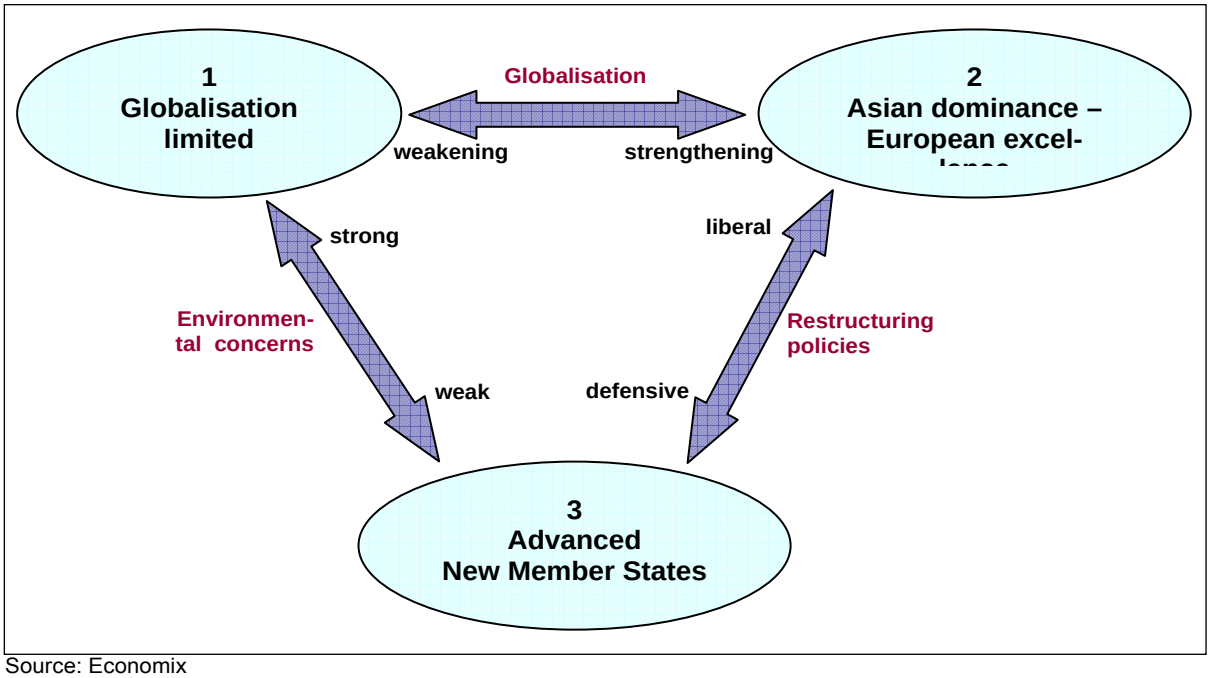
5.1. Overview

As a combination of the results achieved in the previous sections, three drivers are seen to be pivotal for the future of European TCL industries:

- The fundamental problem of climate change which will strongly affect the shape of the global economy. Rising energy prices and climate damages may not only lead to rising environmental costs but may also lead to stronger *environmental concerns* among consumers, policy makers and companies. This will depend on the policy answers which can be found at the global level.
- The economic forces of *globalisation* which take advantage of wage and cost differentials, human resource endowments, and regional specialisation. Having strongly determined the restructuring trends in European TCL industries in the past, they can be expected to be strengthened in the future under the assumption of a liberalised world economy, but also weakened under the assumption of a disintegrating world economy.
- The policy responses to the changing world economy which – until now – made large parts of European (and US) TCL industries disappear. The answers of European *restructuring policies* could be liberal with a lot of trust put into the efficiency of markets, or defensive with a strong commitment for the manufacturing sector in Europe.

Chart 20 reveals how these main drivers are combined for the three scenarios, which are developed in more detail in the following sections.

Chart 20 Drivers and scenarios



Source: Economix

The three scenarios developed on the basis of these considerations can be characterised as follows:

- Scenario 1 called **"Globalisation limited"** is a combination of strong environmental concerns and weakening globalisation. It sees considerable effects from climate change. Rising environmental costs will change the system of global trade and set new priorities for consumers, governments and producers. TCL industries will become more European or even regional under these conditions. Relocated production facilities will return. Even with continuing technical advance, skill needs will shift towards production and crafts-related competences rather than professionals.
- Scenario 2 called **"Asian dominance – European excellence"** combines strengthening globalisation with liberal restructuring policies. It assumes present trends to be reinforced. While environmental problems will be actively addressed, emerging countries will improve their specialisation in industrial manufacturing and EU countries will strengthen their technological lead. Production activities will largely disappear from European TCL industries but a great need for technical specialists and natural scientists will emerge.
- Scenario 3 called **"Advanced New Member States"** links defensive restructuring policies with weak environmental concerns. It describes how the European Union and the low-cost countries among the Member States are going to defend the industrial basis in Europe. Facing the strongly negative effects of globalisation on manufacturing employment (and TCL employment in particular), a comprehensive policy programme aims to revive industrial production. This will reinforce the segmentation of skill needs in Europe: strong demand for production-related skills in low-cost countries and for professionals in high-cost countries. Employment trends will see a turnaround by the end of the forecasting period.

Table 17 contains assumptions and outcomes of the scenarios in a synoptic way. The rationale of the scenarios is described in the following sections. All scenarios cover all 27 EU Member States.

Moreover, all scenarios assume that:

- The development of the knowledge base is pivotal for all scenarios, even if the skill needs associated with the structural transition of the TCL industries are quite different. It is not as-

sumed that the decline of employment will largely destroy training structures in the Member States. In contrast, education and training investments will receive further public support.

- Europe is also expected to develop its industrial basis by restructuring, but in different ways: pro-active or defensive. Comparative advantages in international trade are not simply market-driven, but rather the result of private and public investments put towards the search for excellence. Education and training are part of these efforts. The scenarios do not include the vision of a vastly de-industrialised European territory.
- The emerging countries are expected to cross a period of strong restructuring, triggered by rising wages and environmental costs. These countries will undertake strong efforts to escape from low-cost competition and get access to profitable market segments. In the long-run a more balanced situation is approached as regards wage and cost differentials as well as trade flows.
- Finally, the scenarios do not refer to catastrophes or “the big crisis” which calls everything into question. There is some belief in the rationality of human societies, even if this opinion is challenged by the current financial crisis.

Table 17 Scenarios for the European textiles, clothing and leather/footwear sector up to 2020

Driver	Scenario 1 **Globalisation limited**	Scenario 2 **Asian dominance – European excellence**	Scenario 3 **Advanced New Member States**
Environmental costs	Rising significantly; Climate risks are strongly visible; Environmental policies with limited efficiency;	Rising; Environmental policies are effective; Climate risks remain manageable;	Rising; Environmental policies are effective; Climate risks remain manageable;
Markets	Consumers strongly concerned about climate risks; Global economy disintegrates due to environmental conflicts; Slow macro-growth;	Consumers appreciate environmental politics; Global market for top qualities; Global labour division is developed further; Strong macro-growth;	Consumers prefer job creation and remain price-sensitive; Medium macro-growth;
Knowledge base	Innovation concentrated on ecological technologies; Revival of traditional crafts; Switch from labour productivity to energy productivity;	Strong product innovation for specialty textiles; Design, marketing and sales very important; Management of the value chain;	Mainly process innovation provided by machinery and organisational changes; Strong increase of labour productivity;
Competitiveness	Declining competitiveness of emerging countries due to high environmental costs; Ecological and social criteria have strong impact on competitiveness;	Strong position of emerging countries in low and medium quality segments; Strong position of European producers on high value markets and specialty textiles;	Strong position of low-cost areas in Europe in medium quality segments; Strong position of high-cost areas on high value markets and specialty textiles;
Branch structures	Locally concentrated value chains due to high transport costs; Small-sized production networks; Rising share of craft business;	Closure of mass production; Small-sized innovative companies; Global networks of producers; Highly specialised crafts businesses;	Mass production remains in European low-cost areas; Switch from sub-contractors to independent suppliers: Top quality and international brands in high-cost areas;
Foreign trade	Low growth of world trade;	Strong growth of world trade;	Medium growth of world trade;
Employment change 2006-2020	–25 %	–50 %	–20 %
Skill needs	Revival of production-related trades; More managers and professionals in low-cost areas; Specialists for technical innovation; Specialists for traditional crafts; General need for ecological competences;	Strong decrease of production-related trades; Limited demand for highly specialised craftsmen; Strong increase for technical and commercial specialists, computer professionals;	Strong demand for managers and commercial professionals in low-cost areas; Limited demand for technical specialists in high-cost areas; Decrease of production-related trades and craftsmen;

Source: Economix

5.2. Scenario 1: Globalisation limited

World trade is at risk from the strong rise in energy prices in the short-run, and the unsolved problems of climate change in the long-run. Many observers actually expect a long-lasting rise of energy prices which will affect global logistics (International Energy Agency, IEA 2007). Long-distance transport will become less profitable and partly compensate labour cost advantages of relocated production sites.

The risks for globalisation, however, come from climate change rather than transport costs. In addition to energy prices this will create substantial burdens to all economies. The costs of climate protection are currently estimated at 1% of worldwide GDP – an estimate which may well appear as an optimistic assumption. Climate damages will add to that and, more importantly, will make the external costs of unrestricted energy consumption visible.

This will fundamentally change the views on globalisation. Individuals will alter their consumption behaviour, taking the climate effects of long distance transportation and the environmental conditions of local production more and more into consideration. Countries with a poor environmental performance will see negative consumer sentiments. Governments will establish product-related balances of energy consumption and environmental impacts (REACH). On this basis they will try to manage international transport and restrict trade with environmentally dubious products. Products with an unfavourable environmental index will stay unsold. Consumers will develop strong eco-fashion prevalence.

In addition, social concerns about labour conditions in developing countries will receive more attention. The European Commission will try to implement social minimum standards as regulatory orientation for foreign trade. The big producers – like China or India – will see the necessity to impose effective environmental legislation and social minimum standards. Both will raise overall production costs. Import prices will increase.

Additionally, the risk of international disputes will rise as climate damage will be distributed unequally in the world. Polluting and polluted countries are not the same. Strongly polluted countries will not have the resources to participate in international trade as they did before. Global trade will slow down under these conditions. Transport distances will decline and a greater share of local production will become competitive. Relocating production facilities will become less attractive. Parts of the Asian production will return to Europe, to the low-cost areas in particular. However, exports will also be limited.

For TCL industries this means that parts of the industry will be under threat, especially the textiles and leather industries. Cotton crops will be particularly affected because of the restrictions on the use of fertilisers, water consumption and chemicals. Alternative natural fibres will profit from these developments. The tanning and dyeing and finishing of textiles and leather will have to invest substantially into environmental protection and the development of less pollutant substances.

Slower economic growth and rising prices will reinforce the feeling that Europe – and the world economy – are going through a serious crisis. There will be less growth in income and production costs will rise due to additional costs of environmental protection and the internalisation of the costs of climate change. Consumers will be partly inclined to share these costs, but will also adjust consumption patterns. Austerity will be the virtue of the day. Fashion orientation will become less important as consumers will prefer durable products. Retail systems based on cheap fashion products will be under threat.

New technologies will also be evaluated according to their environmental impacts. They will have to provide evidence of improved energy efficiency and lower emissions. New functionalities are less relevant. This will alter innovative strategies for the development of specialty textiles but, nevertheless, will strengthen their importance.

Regarding skills and competences, the knowledge of ecological processes and technologies will become more important. Old, nature related techniques will be revitalised. Synthetic materials will be abandoned, especially if they are associated with pollution. Knowledge of natural materials, traditional spinning and weaving techniques, dyeing and finishing with natural substances will become relevant. Even designing fabrics and garments will be reoriented back to their historical roots. Consumer tastes will become more traditional and regional.

Small scale production units will become profitable as the external environmental effects of large scale factories are now internalised. Every production step will have to be controlled ecologically, and transport distances will be considered. This will be at the advantage of local and regional production, which will also experience positive demand impacts. Existing production networks will be strengthened and new clusters will be created. Craft related businesses will see better times than in the past.

In the first round these changes might be at the advantage of the low-cost areas in Europe. However, they will probably not remain in low-cost areas, having to bear the costs of environmental protection and being faced with high wage pressure. In the long-run, therefore, cost structures can be expected to equalise in Europe. This will change the European map of TCL production:

The traditional centres of TCL industries in Italy, Belgium, France, UK, and Germany will be revived, particularly if they are highly specialised and strongly consumer oriented. The crisis will happen in the centres of mass production, in Asia and in the New Member States.

The inability of nations to find an adequate solution for the climate problem will curb world trade growth considerably. This will result in an economically sub-optimal allocation of world production. Overall growth will, therefore, be reduced in the European Union.

TCL products, however, supply the basic needs of the population. Even at low growth, these products are needed and will, therefore, keep or even increase their share in total consumption. Consumers will upgrade European products – a trend which also helps in selling products at higher prices. Moreover, import competition will become weaker. This will also strengthen the market position of European producers. Exports, however, will shrink due to the disintegration of the world economy. The export-oriented producers will face severe difficulties and will reorient their sales activities towards national or even local markets.

Nevertheless, price competition among European producers will remain strong. This will induce further production relocation to low-cost areas in Europe, at least as an immediate reaction to the disintegrative forces. In the longer run, however, the low-cost countries of the EU will be forced to bear higher costs of environmental protection. Moreover, wages will increase more rapidly due to rising labour demand. Cost levels and cost structures will therefore converge between low and high-cost areas.

5.3. Scenario 2: Asian dominance – European excellence

The active solution of the world energy and climate problem according to the IEA "450 stabilisation case" scenario opens different options for the evolution of world trade. By improving energy efficiency at all levels – from power generation to industrial production and end users – the expected rise of CO_2 emissions can be avoided until 2020 (IEA 2007). This will not only require a rise of R&D, but will also need huge investments in renewable energy technologies, nuclear plants, and the efficiency of energy consumption in particular. These investments will pay off through less environmental damages, better health of the population, and in the long run lower costs of climate change. In the short run, however, energy prices and environmental costs will rise considerably.

Consumers will perceive environmental problems to be less severe as governments take effective measures to restrict CO_2 emissions. They will continue to be price-selective in their purchases. Rapid changes in fashion styles will dominate consumer preferences. The origin of products will not important but the design and status will be. Consumers will be open to new developments and technologies.

The Asian countries will participate in these efforts. China in particular will continue to effectively reduce emissions as laid out in the current Five-Year-Plan. This will result in a considerable cost burden. However, the country will use this opportunity to develop its technological basis and raise competitiveness with quality improvements, also in TCL production. The industry will abandon low-cost segments to less developed countries and will concentrate on the intermediary part of world TCL markets. Initially, India will take a great part of the low-cost segment. In the long run, however, it will follow China's upgrading path. The two countries will be able to improve the quality of products and the complexity of industrial production. Due to increasing strength they will become the most important producers of manufactured goods. They will strongly invest in education, training and R&D. Companies will undertake great efforts to create their own brands, develop marketing strategies and directly access European markets. As their greatest success they will be able to establish Asian fashion and living styles as dominating consumer trends in Europe and the Western world.

The low-cost segments will move further to other Asian countries like Vietnam or Bangladesh, and the Mediterranean Area. Morocco, Tunisia, and Egypt will take greater parts of these markets. Turkey, however, will be close to the Chinese and Indian strategy.

Price competitiveness against European producers will decline due to both rising environmental costs and wages. However, cost advantages will not disappear as Europe is faced with a similar economic pressure.

European "producers" will fully concentrate on sales and value chain management. Strengthening existing brands and creating new labels for all market segments will dominate business strategies. Extensive use of information and communication technologies will guarantee proximity to markets and, together with the concentration on retail trade, will create an important strategic advantage in comparison to foreign competitors.

A few successful "producers" will become retailers and will thus leave the sector in the statistical sense. Most of the remaining production facilities will be either relocated or will simply disappear from the markets. European production will only survive in two niches; specialty textiles and top quality consumer products.

Specialty textiles will continue to be the only growth segment of the European textiles industry. The rising demand for light construction elements – being driven by environmental targets – will foster this trend. New products will be developed: smart textiles using nanotechnologies or bioscience will achieve market maturity, also supported by a considerable share of "experimentally oriented" consumers. Great progress will also be made in the medical use of textiles, integrating electronic control functions like blood pressure, temperature control etc. Specialty textiles will become a major part of the European textiles industries.

Based on strong links to chemistry, biotechnology, electronics and physics the specialty textiles industry will become a high-tech industry. Material research and application will be the dominant task of the industry, which will thus be highly fragmented in specialty segments. Parts of production will be undertaken by the chemical industry, producers of medical appliances and construction materials. In addition, strong efforts will be undertaken in using alternative natural fibres, like corn or hemp. This will reduce the present environmental problems arising from cotton production.

The remaining European producers will use their present top position in high quality segments. High-price garments, bags and shoes produced in Europe will be sold successfully on world markets (in small batches only) and to the wealthiest part of consumers. Producers will cultivate traditional production techniques and upgrade products in quality and design.

In parallel, machinery producers of textiles and clothing will profit from external demand. They will make progress in developing 3D-garments and skipping the sewing process of garment production. Automated sewing machinery will also be used efficiently. This will be at the expense of job growth in producing countries – China and India in particular – but it will not challenge their position as major producers. They will be able to apply these technologies efficiently and thus keep their cost advantages unchanged.

Regarding leather production, Brazil and Argentina will serve the greatest part of world demand. European producers will continue to supply high-quality markets. Leather products and footwear will largely be produced in low-cost countries.

The reorientation towards trade and value chain management among consumer product providers will lead to a rising concentration among firms. A few big retailers will take the major part of consumer markets, supported by fashion trends rapidly spreading around the world. Leading the market in both fashion and low price will be important for success. Zara, H&M or Cortefiel will see the rise of competitors but only a few will survive.

The sale of high-value products will be improved by mass-customisation approaches, which gives a wider scope for individual design and quality of garments, textiles or carpets. The volume of individualised products, however, will remain limited due to the differentiated fashion oriented

supply in mass product markets. This will cover great parts of the demand for individualised styles.

The New Member States will be particularly burdened by these changes. The competitive position of TCL industries against the Asian and Mediterranean producers will deteriorate due to increasing economic and social integration in the EU. With the target to improve growth and income, they will be forced to follow a high-tech and high-value strategy not only in manufacturing but especially in knowledge-based services. As in the EU in total, TCL industries will not play an important role for such an industrial policy.

5.4. Scenario 3: Advanced New Member States

Facing continuous job losses in the European manufacturing sector, EU governments will see the need to combat de-industrialisation trends. This will be reinforced by workers and trade unions, who demand a higher priority for jobs. Environmental concerns will remain secondary.

Through a common initiative, the European Commission and the New Member States will decide to defend TCL industries against the Asian challenge. The 'Advanced New Member States Programme' will include a series of measures[7]:

- Strong investments in vocational training for technical and commercial professions should close the skills gaps, increase R&D outputs and promote business foundations. New training courses will be implemented and traditional crafts will be revitalised.
- Competitive production networks will be established, which take advantage of high product specialisation and the resulting economies of scale.
- Technology-oriented and R&D-intensive production sites will be established, which will gradually become competitive in world markets. Producers will profit from the worldwide trend towards specialty textiles.
- Clothing companies will invest in designing and marketing apparel, trying to create their own brands and establishing independent marketing channels.
- Costs will be kept at low levels through moderate wage increases, low taxes and efficient use of European Structural Funds.

With this approach, low-cost areas in the European Union will be able to successfully compete in the medium range of TCL products. The low-end is still left to the (non-EU) Mediterranean countries, while Asian countries will have lost parts of their competitiveness: they will have to face rapid wage increases, rapidly rising transport costs, and slow quality progress. Missing protection of intellectual property will remain a major threat to foreign producers. Moreover, the Asian countries will experience a re-orientation of investment activities during their second restructuring phase. This aims at establishing a strong industrial high-tech basis in these countries. TCL industries are no longer among the strategic priorities.

The approach in the New Member States will be strongly efficiency driven. Based on significant improvements of public infrastructure and services, and attracted by EU support, companies will increasingly relocate production to European low-cost areas. Even Asian production facilities will be relocated in order to escape the difficulties of producing in these regions.

The strategy will be based on the high-skills structure and supported by the creation of modern training facilities in the New Member States. Strong investments will be undertaken by national governments and the EU to upgrade training in engineering, business administration, management, marketing and design. As job perspectives will be favourable due to the rising number of companies, the number of graduates will also increase. The revival of craft-related vocational training will be of great importance as this appears to be the basis for producing high quality goods. In the long run, the New Member States will, therefore, be able to provide all competences

[7] Portugal and Greece will also join this programme, as they are strongly interested to defend TCL industries in their countries.

required to run independent businesses. The dependency on know-how imports from high-cost areas will decline continuously.

Moreover, high-cost areas will be less and less able to provide the skills necessary for the development of the sector. The human capital basis of these countries will gradually erode due to the specialisation of sales activities. Technical innovation and product innovation – beyond fashion design – will shift to the producing countries rather than the trading countries. Many of the specialists will move to these areas, also attracted by favourable income offers. Gradually, however, the importance of these expatriates will decline.

This will form the nucleus of an independent TCL industry in the New Member States. Companies will start creating their own brands, designing worldwide marketing strategies, and developing new products and production technologies.

The key to economic success of the New Member States, however, will be the implementation of self-governed sales activities. The profits from wholesale and retail trade are required to independently finance the investments in human capital and new technologies. The links to the big European traders will therefore be cut at some point in time and replaced by new brands which compete with the established trade marks. This will be the main focus of the New Member States' competitive strategy. Strong investments will, therefore, be undertaken to improve its economic and technological basis.

Due to weakening cost competition from Asian countries, the New Member States will be able to allow for a moderate wage increase. Efficiency gains will also provide the productivity gains required to raise wages, which will be necessary to attract skilled workers in TCL industries. The competition with Asian and the non-EU Mediterranean countries, however, will set narrow limits to rapid wage increases – not only in TCL industries but in all other sectors of the economy. Workers will have to understand the rationale of such a strategy which demands their contribution to restructuring and competitiveness.

In the high-cost areas of Europe, traditional TCL industries will shrink to past trends. Even worse, the human capital basis for the high-quality segment will deteriorate and dominant sales chains will be attacked by the competitors from the New Member States. The major escape from this situation will be visible in specialty textiles, which will become more or less the only segment of TCL industries in high-cost countries. Switching to the technical segment and abandoning production for consumer markets will be the principal rationale of structural transition. Companies and governments will follow this direction accordingly.

5.5. Employment effects

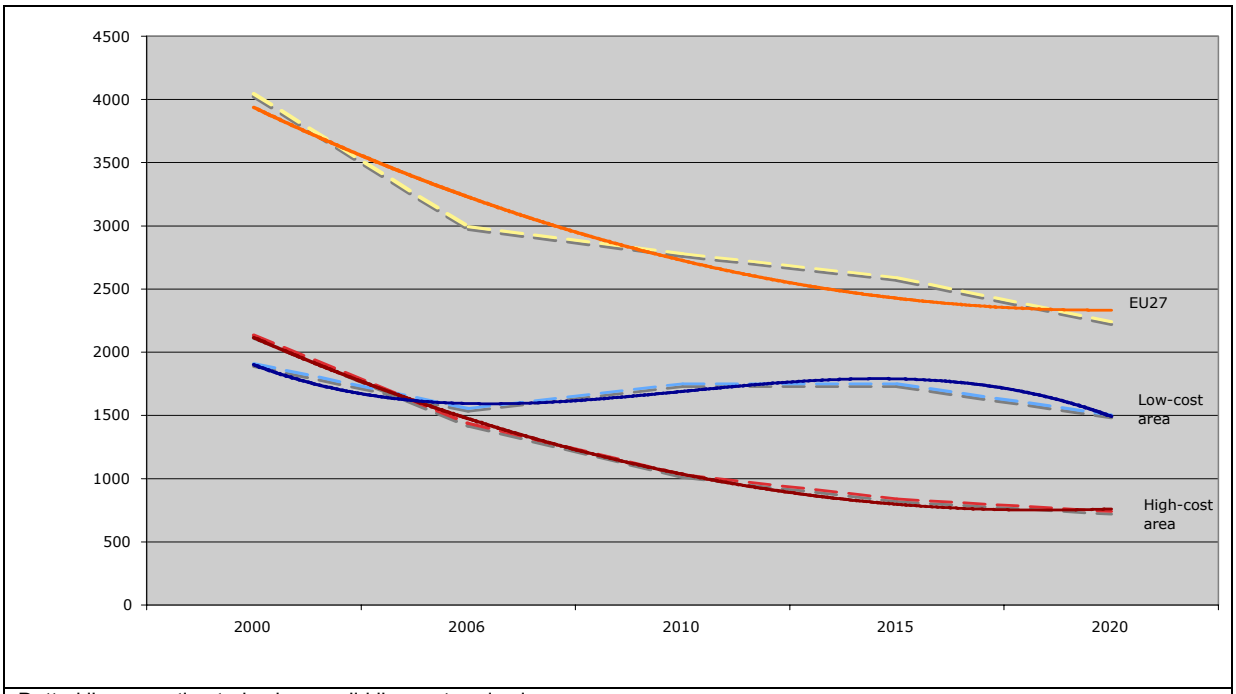
5.5.1. Scenario 1: Globalisation limited

Employment can be expected to decrease further –particularly during the disintegrative transition phase (Chart 21). The overall employment loss for the EU27 countries is estimated at 25% over the period 2006 to 2020 (–750,000 jobs).

Low-cost areas will be able to raise employment during the first ten years after having passed the transition phase. However, they will see a decrease afterwards. The 2020 level of employment is expected to be slightly below the 2006 level.

High-cost areas will have to bear the major burden of the transition phase but achieve a more stable development thereafter. This can be assigned to the gradual shift towards a new market equilibrium but also to the stronger position of high-cost areas in specialty textiles. These are expected to grow further at high rates.

Chart 21 **Employment trends in the "Globalisation limited" scenario**
Number of persons employed (1000)

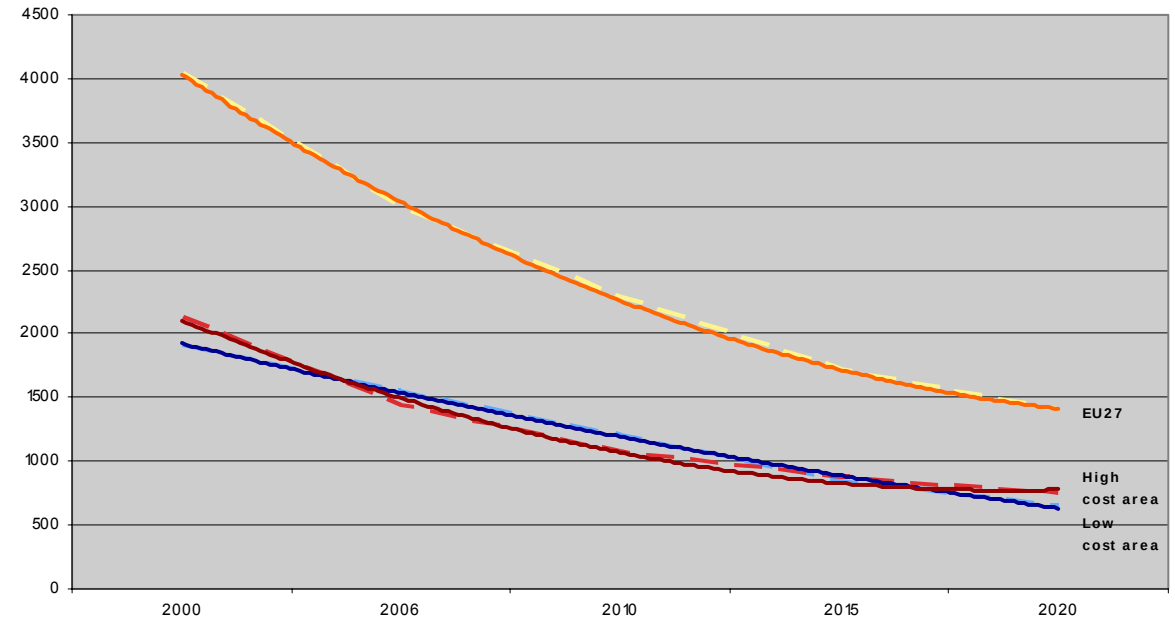


Dotted lines – estimated values; solid lines – trend values
Source: Economix

5.5.2. Scenario 2: Asian dominance – European excellence

World trade will more or less continue to grow at present rates. The allocation advantages of international trade will therefore strongly affect European TCL industries, stronger than during the periods of regulated trade. European jobs will therefore continue to decline. Until 2020 the EU27 area will lose more than half of its present TCL employment (–1.6 million of the 3 million jobs in 2006; Chart 22).

Chart 22 Employment trends in the "Asian dominance – European excellence" scenario
Number of persons employed (1000)



Dotted lines – estimated values; solid lines – trend values
Source: Economix

The decline will concentrate on the first period up to 2015 and will then gradually phase out. The new equilibrium will be achieved when the production sector will be largely transformed into a trading business. Specialty textiles will then contribute to the deceleration of employment losses.

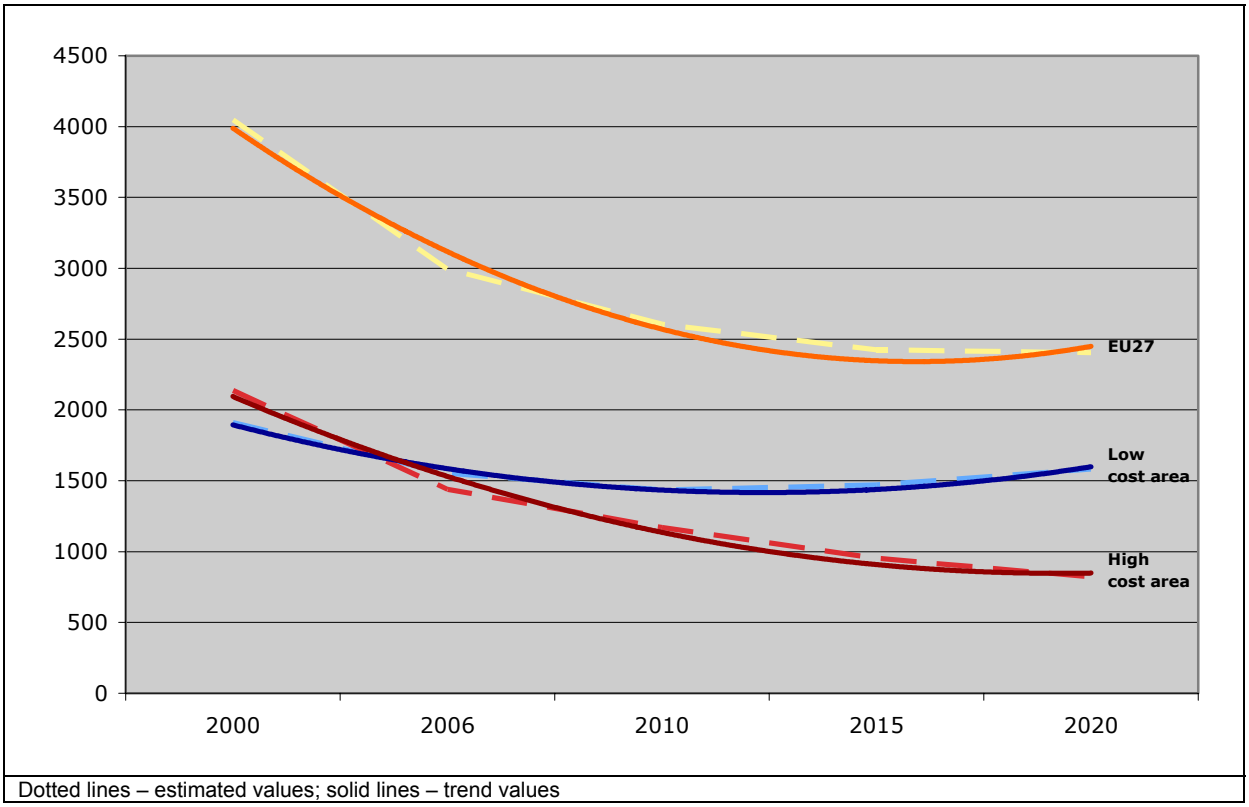
In principal, these trends will affect both high-cost and low-cost areas in the EU. High-cost areas will profit more from the growth of specialty textiles and thus approach the bottom of job losses by the end of the projection period. Low-cost areas will hardly be able to profit from growth in specialty textiles as these markets – which are becoming more and more mature – will increasingly be protected by high entry costs.

This would mean that the lowest level of TCL employment will be around 750,000 in high-cost areas, compared to 1.4 million in 2006 (Chart 22). In low-cost areas employment can be expected to shrink to 650,000 by 2020. This would be a loss of 900,000 jobs from the 1.5 million in 2006. A turnaround of this development cannot be seen within the scenario horizon.

5.5.3. Scenario 3: Advanced New Member States

The 'Advanced New Member States Programme' will be able to stabilise employment in the low-cost areas of the European Union (Chart 23). More than that, it will be able to achieve a turn-around of EU employment in TCL industries after a long transitional phase. It will certainly take several years until companies in the low-cost areas of the EU will be able to profit from the re-structuring measures. The resulting improvement of the competitive position will then yield a rising number of jobs. This will certainly be at the expense of manufacturers in EU high-cost areas, but also in Asia and other countries.

Chart 23 **Employment trends in the "Advanced New Member States" scenario**
Number of persons employed (1000)



Dotted lines – estimated values; solid lines – trend values
Source: Economix

The estimated employment figure for EU27 will shrink to 2.4 million and will only slightly increase at the end of the projection period. By 2020 TCL industries will have lost 20% of their 2006 workforce. In low-cost areas, however, employment will start to increase again around 2013 from 1.45 million to 1.6 million in 2020. The high-cost areas will see a continuous decline of employment from 1.4 million in 2006 to 800,000 in 2020.

5.6. Impact on skills

5.6.1. Scenario 1: Globalisation limited

The partial relocation of production back to Europe will enforce production activities (Table 18).

Table 18 **Change of occupational structures in the "Globalisation limited" scenario**
Tendency of % change; 2006-2020*

Occupation	High-cost area	Low-cost area	EU27
Managers	+	+	+
Computing professionals, associated professionals	=	+	+
Engineers, associated engineers	=	+	+
Business professionals, associated professionals	–	=	–
Other professionals	–	–	– –
Office clerks and secretaries	–	–	– –
Service and sales workers	–	+	=
Textile, garment and related trades workers	+	++	++
Pelt, leather and shoemaking trades workers	+	++	++
Other craft related trades workers	+	+	+
Textile, fur and leather products machine operators	=	=	=
Plant and machine operators, assemblers	–	=	–
Labourers	–	=	–
* Change of % shares of area total:	++ strong increase; + increase = no change – – strong decrease; – decrease		

Source: Economix

Textile and garment workers will see stronger demand in relation to overall job offers from the sector. This will also be the case for pelt, leather, and shoemaking trades, and other craft related trades. With smaller company sizes, the share of machine operators and assemblers will not increase. In high-cost areas it will continue to decline.

Management capacities will be extended, particularly in low-cost areas tending to establish networks of independent companies. This requires a higher share of management capacities and professionals. Administrative functions, however, will be reduced due to the smaller company size. Service and sales workers will not see much change.

The preferred new competences will be in three areas:

- The “technical” section of textiles and apparel production will require more specialists. In addition to textiles and apparel engineers, chemists, physicians, and computer professionals will be at the top of recruitment lists. Innovation is the main target, demanding creativeness and unconventional thinking. Crossing borders of professions will be important for success.
- The “traditional” section will appreciate high specialisation on craft-related production knowledge. Not only will fashion designers be required to provide knowledge of sound historical roots of European clothing. Craftsmen will revitalise old production technologies, and repair and reusing will become important.
- Finally, all occupations will have to extend ecological competences, which will be considered vital in all parts of production, marketing and business management. The focus of technological development is on eco-products and eco-technologies which demand highly skilled “eco-engineers” and “eco-fashion designers” with a sound knowledge of both past and future technologies.

Due to the expansion of production-related activities, the change of occupational structures will not result in a higher share of highly educated people. In contrast, intermediary skills will be extended with a good knowledge of production processes and ecological impact. Low-skilled education and training levels will be less important.

5.6.2. Scenario 2: Asian dominance – European excellence

The loss of jobs will mainly be at the expense of textile, garment and leather trades, machine operators, and assemblers (Table 19). This is due to the gradual disappearance of TCL mass-production from Europe. These jobs will be lost in the long run.

Table 19 Change of occupational structures in the "Asian dominance – European excellence" scenario
Tendency of % change; 2006-2020*

Occupation	High-cost area	Low-cost area	EU27
Managers	+	+	+
Computing professionals, associated professionals	++	+	++
Engineers, associated engineers	++	+	++
Business professionals, associated professionals	++	=	+
Other professionals	+	–	=
Office clerks and secretaries	=	=	=
Service and sales workers	+	–	+
Textile, garment and related trades workers	– –	–	– –
Pelt, leather and shoemaking trades workers	– –	–	– –
Other craft related trades workers	+	=	+
Textile, fur and leather products machine operators	– –	–	– –
Plant and machine operators, assemblers	– –	–	– –
Labourers	=	–	=
* Change of % shares of area total: ++ strong increase; + increase = no change -- strong decrease; - decrease			

Source: Economix

The skill composition of the TCL sector will, therefore, shift towards a higher share of professionals. This will partly result from the decline of production-related occupations. The main reason, however, will be the transition to trade and the specialisation on specialty textiles.

Trading companies will require more textiles and clothing engineers, business managers, sales and marketing specialists, and computer professionals. It is possible be that these companies will no longer be classified as parts of TCL industries. The demand for these specialists will, nevertheless, remain important.
These specialists need a strong knowledge of textiles, clothing, leather goods or footwear production. They need to know the principles of production technologies, efficient organisation, material use, as well as the mechanisms of TCL markets worldwide. Consumer behaviour and preferences have to be considered in combination with the ecological aspects of TCL production. The concentration on technical issues which have prevailed engineering education until now, will be broadened in favour of business administration and international marketing. Languages and cultural competences will be particularly important.

The growing specialty textiles sector will require another type of skills enrichment: being at the forefront of applied natural science, the sector requires professionals with a broad view on the latest research in chemistry, physics, electronics, and material science. Moreover, they need to understand how customers apply products, and the technologies used. Innovation will be driven by this combination of scientific knowledge and application. Similar to the change of competences induced by the transition to trade, the essential competence is knowledge of textile and clothing engineering. Sufficient competences come from other professions – business administration and natural science in particular.

Craft-related trades will see some demand due to the survival of highly specialised manufacturers. However, these workers will only be available in a few regional labour markets where not

only manufacturers survived, but training institutions were also preserved. Regional production networks in Italy, France, Germany, Portugal or the UK would be able to keep these structures alive.

One of the risks involved in this scenario is that training institutions cannot be kept in Europe due to declining demand. Training institutions will be closed and production knowledge will be lost together with practical experience in traditional crafts. Asian countries will expand their training activities and will build up new training centres. European students might increasingly attend the courses provided by these countries.

Based on improving production knowledge and competences, Asian countries will also attract TCL machinery production. European manufacturers will relocate to Asia and will thus transfer a major part of know-how. Asian countries will add mechanical engineering specialists in order to build a competitive TCL machinery industry.

5.6.3. Scenario 3: Advanced New Member States

Occupational structures will change considerably in the low-cost areas. In contrast to past trends they will employ more managers, technical and business professionals, computer specialists and, in particular, more sales and service workers (Table 20). Most importantly, however, these countries will see a fundamental reorientation of competences from technical and organisational knowledge to strategic management, marketing and sales, business administration and design. All intellectual power will be concentrated on the task to create an independent and competitive industry rather than acquiring low-cost contracts from clients abroad. This will be a matter of corporate identity and a long-term strategic orientation.

Table 20 Change of occupational structures in the "Advanced New Member States" scenario
Tendency of % change; 2006-2020*

Occupation	High-cost area	Low-cost area	EU27
Managers	=	++	+
Computing professionals, associated professionals	+	++	+
Engineers, associated engineers	+	++	+
Business professionals, associated professionals	=	++	+
Other professionals	=	+	+
Office clerks and secretaries	=	+	+
Service and sales workers	+	++	+
Textile, garment and related trades workers	–	–	– –
Pelt, leather and shoemaking trades workers	–	–	– –
Other craft related trades workers	–	–	– –
Textile, fur and leather products machine operators	– –	–	– –
Plant and machine operators, assemblers	– –	=	–
Labourers	– –	=	–
* Change of % shares of area total:	++ strong increase; + increase = no change -- strong decrease; - decrease		

Source: Economix

Parts of the high-cost countries have already achieved such a reorientation towards growth markets, and they will foster these trends. The competitive advantage of specialty textiles will be promoted by a new generation of employees who recognise the potential of new technologies. They will only have minor links to traditional TCL industries. In contrast, they will understand themselves as technically advanced innovators who need to overcome the traditional boundaries of sectors, technologies and markets. This perspective will promote jobs for engineers, natural scientists, and computer specialists. Management, sales and marketing activities will be less

important as innovation will be achieved by small companies rather than the existing big manufacturers.

Employment volumes will, nevertheless, be limited in these growth markets and will not be able to compensate the losses in traditional TCL companies. The share of production workers can, therefore, be expected to decline continuously. All skill levels in production will be affected by this trend, textiles and clothing trades, leather and shoemaking trades, machine operators, assemblers, and labourers. The new TCL industry of high-cost countries will be a high-tech sector.

The risks included in this scenario will come from two directions:

- Workers will not accept a low-wage strategy. They will migrate to high-wage countries and increase the pressure on political institutions and social partners to improve the income position of production workers in the New Member States. The orientation of all actors towards the long-term restructuring targets, therefore, appears to be very important for the success of this strategy.
- The market position of companies in the low-cost areas is too weak to escape the role of extended shop floors, and the governments have not decided to invest in the human resource basis of the sector. The long-term government decision of taking the risk of a competitive struggle with Asian countries will be particularly important for investors from high-cost countries. This will reduce individual risks and create the synergies necessary for such a fight.

More than the other scenarios, the path along the "Advanced New Member States" scenario is based on the political will of national governments and the European Commission. The development of long-term perspectives and the improvement of the human capital basis appear to be the pivotal points of such a strategy.

6. Strategic impacts on human resources, education and training (Steps 5 to 7)

The three scenarios describe alternative "worlds" for TCL industries in the EU which imply different adjustment strategies of companies, sector organisations, training institutions and policy makers. The common challenge of all scenarios, however, is the further decline of employment which weakens the competitive position of employers and hampers restructuring. Before entering the "worlds" of the scenarios again, a view on human resource policies under the conditions of a long-term decrease of employment is required.

6.1. Human resource policies in a declining industry

The long-term reduction of employment results in high unemployment risks for the staff employed, a small number of job openings for those entering the sector, and a generally poor attractiveness of the sector also due to low wage levels and a slow wage increase. This does not make human resource policies easier, and many companies therefore complain about skills shortages. Individual companies with a better employment performance than the average might achieve a favourable competitive position on labour markets. A positive image of labour markets, therefore, can be created by individual companies rather than the sector itself.

Company restructuring appears to be difficult in such a situation. While markets demand a high speed of re-restructuring in all areas (products, technologies, and organisation) the human resource policy in companies is determined by low labour turnover, the great importance of internal labour markets, and an ageing work-workforce. Particular skills shortages appear among emerging skills which are scarce due to low labour supply and strong competition among employers. This recommends developing the internal labour force by

Expert panel 9/10 October 2008:
The experts underlined the fundamental problems of TCL industries in Europe:

- The erosion of the human capital basis
- The lack of a coherent development strategy for the sector, in spite of sectoral planning in China, India, or Brazil
- The lack of cooperation among firms

It was recommended to use available resources carefully, in particular in the area of training in order to maintain efficient training structures. The exchange of students should be promoted and cooperation among firms enhanced. In the New Member States a reorientation of ESF fund towards human capital investments should be achieved. EU qualification standards should be implemented.

lifelong learning, internal career promotion, and active ageing policies.

In parallel, wages are limited by strong cost pressure from abroad. This restricts wage offers to highly skilled workers who would be needed to increase innovation and improve economic performance. Specialty textiles are particularly affected by this phenomenon as this sector requires highly innovative engineering staff. Restructuring in the New Member States is also restricted as highly qualified workers search for jobs in high-wage areas rather than their home countries. This leads to a wide-spread shortage of strategic skills in the industry.

Finally, training is at risk in highly specialised but declining industries. Decreasing training participation puts training courses at risk or even leads to the closure of training centres. But not only students prefer training for promising labour market segments. Workers also have little incentives to invest into life-long learning if they face high unemployment risks. Market forces alone, therefore, lead to a downward spiral of extended skills shortages in face of declining employment. Governments are, therefore, particularly under pressure to compensate such market failures and provide training facilities for the sector in those regions where TCL can be expected to survive.

6.2. Adjustment strategies at company level

Following the typology of the Institut Français de la Mode (Section 2.1) the three scenarios assume different adjustment strategies (Table 21):

- *Scenario 1* includes both a networking and a subcontracting strategy. Networks will be established in high-cost areas in order to use a broad range of competences to upgrade products and advance environmental innovation. With lower competition from Asian mass-production, producer networks will be the answer to differentiated consumer needs. In parallel, however, subcontracting will remain important for mass-products, which will mainly be produced in low-cost areas.
- *Scenario 2* is a technological leadership scenario where European producers will only serve the upper end of markets and will abandon not only mass production but also large parts of medium quality production. This will bring Asian and Mediterranean competitors into a favourable position. It is a brand and design strategy where marketing will be in the centre of activities. In this sense it will also be an industry-retail strategy as large producers will transform into traders. Production networks will not survive in face of foreign competition.
- *Scenario 3* assumes the transformation of TCL industries in low-cost areas to competitive production networks which will develop their own brands. Companies will be able to escape the prevailing subcontracting system and achieve a much higher degree of independence.

Table 21 Main adjustment strategies

Adjustment strategy	Scenario 1 **Globalisation limited**	Scenario 2 **Asian dominance – European excellence**	Scenario 3 **Advanced New Member States**
Brand and design strategy		●	●
Networking strategy	●		●
Industry-retail strategy		●	
Subcontracting strategy	●		
Technological leadership strategy		●	

Source: Economix

The different strategic approaches of the scenarios imply different adjustment measures (Table 22):

- *Scenario 1* puts the focus on changes in the internal work organisation due to the return of production activities to Europe and the rising importance of environmentally sustainable production. It will require substantial retraining of the labour force and knowledge transfer in the area of environmental technologies. This will include the revival of old technologies.
- *Scenario 2* in contrast, will largely be based on outsourcing and relocating TCL production. This also requires changes in the internal work organisation and skills structures. Human resource policies will be concentrated on the exchange of staff rather than retraining the workforce. Promising career structures and competitive wages will be the main instruments as well as broad image campaigns used in order to attract good workers.
- *Scenario 3* will also strongly rely on human capital investments, in low-cost areas in particular, in order to achieve the economic independence on the markets. This requires knowledge transfer from high-cost areas in particular, but also requires improvements of career structures and image campaigns. Recruitment from abroad will be important as well as retraining the labour force. The networking approach will lead to a considerable change in the work organisation in smaller and technology intensive firms.

Table 22 Adjustment measures of companies

	Scenario 1 **Globalisation limited**	Scenario 2 **Asian dominance – European excellence**	Scenario 3 **Advanced New Member States**
Changing work organisation	**+++**	**+++**	**+++**
Retraining of labour force	**++**	**+**	**++**
Recruiting unemployed	**0**	**0**	**+**
Recruiting young	**+**	**+**	**+**
Recruiting from abroad	**0**	**+**	**++**
Improving working conditions	**+**	**+**	**++**
Outsourcing / relocation	**0**	**+++**	**++**
Networking	**+++**	**+**	**+++**
Improving career structures	**+**	**++**	**+++**
Knowledge transfer	**++**	**+**	**+++**
Raising wages	**+**	**++**	**+**
Improving image	**+**	**++**	**+++**

+++ very important; ++ important; + relevant; 0 not relevant;
Source: Economix

6.3. Strategic choices for sector organisations, training institutions and governments

The contributions of public and semi-public organisations to image promotion and sector development will strongly differ for each of the the scenarios (Table 23):

- *Scenario 1* will focus on presenting the TCL sector as a sustainable industry which complies with the environmental norms. Career guidance will be completely different from the present orientation: it will emphasise traditional production and business principles which help strengthen production networks and sustainability. Vocational training will promote this orientation by means of knowledge transfer in the areas of environmental protection and craft-related skills. Training will be strongly company-based in order to achieve the transfer of practical knowledge. Regional labour markets will be very important.
- *Scenario 2*, in contrast, will underline the high-tech image of the sector which needs strong specialists in engineering, science, design and value chain management. R&D policies will promote non-company based institutions in order to receive the maximum input from independent research. Labour markets will internationalise increasingly.
- In *Scenario 3*, TCL industries will appear as a European industry which is not only able to compete with the strong Asian countries but re-attracts parts of the production for Europe. A strong business development orientation will prevail with the focus on management, marketing and design. Institutional vocational training will be more important than company-based training as rapid upgrading of knowledge is required in many areas, especially in business and management practices. Regional labour markets will be very important.

Table 23 Adjustment measures of sector organisations, training institutions and governments

	Scenario 1 **Globalisation limited**	Scenario 2 **Asian dominance – European excellence**	Scenario 3 **Advanced New Member States**
Image of the sector	Sustainable industry	High-tech industry	European industry
Career guidance	Back to the roots	Specialisation	Business performance
Vocational training	Environmental protection; Crafts-related skills	Engineering, design, value chain management	Management, marketing, design
Cooperation between education and industry	Company-based training	Promotion of non-company based R&D	Institutional training
Regional labour markets	Very important	International labour markets	Very important

Source: Economix

6.4. Policy choices

From a wider perspective of economic policies, specific sets of policy mix appear in the three scenarios (Table 24):

- In *Scenario 1* environmental policies will be mainstreamed in all sub-policies, including emission-based restrictions for foreign trade, promotion of environmental technologies through innovation and the creation of energy-efficient clusters which reduce transportation distances. Vocational training, however, will not only focus on environmental issues but will develop the full spectrum of vocational training in order to develop the intermediate skills level in particular.
- *Scenario 2* describes a world of liberalised markets where full advantage is taken from specialisation and the changing allocation of production. Europe, therefore, will concentrate on using professionals in science and engineering with wide interdisciplinary knowledge. Research centres and R&D cooperation will be more important than the defence of existing TCL clusters. The sector will be on the way towards a high-tech sector which has little in common with the present type of products and technologies. Large parts of the consumer markets will be in the hands of big retailers. Industrial policy will be reluctant to interfere with the restructuring process.
- *Scenario 3* is the alternative with the strongest demand on industrial policies which explicitly support business foundations, strengthen regional clusters and promote process innovation, design and marketing. Training policies try to fill the skills gaps by promoting studies in business administration, engineering and intermediary skills. This appears to be a public investment as companies in the low-cost area can hardly fund additional training. Governments also protect the sector by enforcing narrow anti-dumping rules and a stronger protection of intellectual property.

The scenarios describe three alternatives of industrial policies in the EU which – in parts – extend or go beyond the current approaches of the European Commission.

In Scenario 1, industrial policy will become much more “green” than presently intended. Environmental issues will steer trade regulations and the support of industries will be clearly emission based. Industries which do not comply with the new standards will have to face barriers and economic disadvantages. The importance of EU regulations like REACH and action programmes on climate change will not only receive rising importance but be at the core of industrial policies. The focus will shift from economic towards environmental support. While this is not a contradiction in the long-run, it will nevertheless have strong impact on the economic return from present production facilities.

Table 24 Policy measures

	Scenario 1 **Globalisation limited**	Scenario 2 **Asian dominance – European excellence**	Scenario 3 **Advanced New Member States**
Training policy	Full spectrum of vocational training	Professionals, interdisciplinary knowledge	Business administration, engineering, intermediary skills
Innovation policy	Environmental protection, Sustainable production	Research centres, R&D cooperation	Process innovation, Marketing, Design
Cluster policy	Energy-efficient clusters	Only few clusters will remain	Strengthening regional clusters
Industrial policy	Promotion of environmental technologies rather than TCL industries	Science promotion rather than sector promotion	Support of business foundations, Public marketing by regions
Trade policy	Emission-based restrictions	Fully liberalised	Narrow anti-dumping rules Strong protection of intellectual property

Source: Economix

Scenario 3 might be seen as the switch to vertical rather than horizontal industrial policies. This, however, is not intended. Beyond TCL industries – which are the focus of this study – the question of defending mass-production in Europe arises for many sectors. With the example of TCL industries, the scenario therefore tries to develop a strategy which might be effective to keep such working places in Europe, against the powerful flow of liberal world trade. The industrial policy suggested here intends to make workplaces at the lower and intermediary level competitive rather than supporting a specific industry.

Scenario 2 finally is much more in line with present industrial policies at EU level. Together with many Member States these policies give preference to economic growth and high income levels at the price of reinforced restructuring of the economy. For TCL industries this meant and still means the continuous loss of working places. However, the liberal version of industrial policies will be in line with the targets of the Lisbon Strategy for Growth and Jobs if the economy is sufficiently dynamic and innovative to create alternative jobs in other sectors. This rationale is convincing as long as the economy tends towards long-term equilibria and Europe in not falling behind its main competitors.

In face of the current financial and economic crisis and the challenges of climate change, it appears to be particularly important to rethink the approaches. The scenarios therefore did not intend to leave the world as it is. They are arranged around the principles of industrial policies as the answers to future development trends might be found at this point. They intend to open the discussion on workplaces and skill needs exactly from this angle.

6.5. Critical competences

Due to their principal orientation and strategic choices, the scenarios call for different types of workers with specific competences (Table 25):

- *Scenario 1* will have to achieve the transformation into a self-sustaining European TCL sector which is less dependent on international trade and complies with rising environmental standards. This requires a strong change management towards efficient and highly specialised company networks. Marketing channels will have to be established, apart from the existing retail business, and new brands will have to be created. Marketing specialists will,

therefore, have a strong consumer-orientation with social and environmental responsibility. In parallel, administrative departments will be able to imply the new environmental standards efficiently. R&D experts will need to know about sustainable products and have a good knowledge of traditional production technologies. Process engineering will focus on energy efficiency and emission control, and quality control will concentrate on environmental standards. This will include logistics which will have to improve energy efficiency rather than shortening delivery times. Production will be small-scale and specialised and will reuse traditional crafts.

Table 25 Critical competences

	Scenario 1 **Globalisation limited**	Scenario 2 **Asian dominance – European excellence**	Scenario 3 **Advanced New Member States**
General management	Change management Network management	Strategic, visionary, inter-cultural	Quality management, market-oriented
Marketing and sales	Consumer-oriented, socially and environmentally responsible	Client-oriented, technical know-how, trend-setting, intercultural	Competition-oriented, Market knowledge, Intercultural
Administration	Environmental legislation (REACH)	International business	International business
Research & development	Sustainable products and technologies, Traditional techniques	Interdisciplinary, multi-skilled, creative	Market-oriented, efficiency oriented, creative
Process engineering	Energy and emission control, Cost control	Supervision of global value chain	Cost control, Quality control
Production	Small scale, specialised, crafts-oriented	Client-oriented, Technical know-how	Quality-oriented, mass-production
Quality control	Environmental standards Network operations	Diversified standards	Large-scale control systems, network operations
Logistics	Energy-efficiency-oriented	Delivery-time-oriented	Delivery-time-oriented

Source: Economix

- In *Scenario 2*, a strategic, visionary, and intercultural management will be needed which is able to establish a high-tech TCL sector in Europe. This will require interdisciplinary, multi-skilled and creative R&D staff including engineers and designers. A strong client-orientation will be needed not only among marketing and sales workers but among production workers as well. Small batches of customised high-value products will be produced, which require a sound knowledge of clients' businesses, markets and technologies. Process engineering will mainly supervise the global production chain with diversified standards and short delivery times.
- *Scenario 3* will be based on a market and quality oriented management which is able to establish an independent TCL industry in low-cost areas of Europe. This will require strong cost control, high efficiency of production processes and tight control of quality standards. Improvements of intermediary production skills will be particularly needed. In parallel, this

strategy will rely on innovative and creative capacities of designers, engineers and business professionals, both in product development and in marketing. The task is to establish an efficient and flexible type of mass-production at low costs – something which is indeed ambitious. Administrators will have to support the strategy through sound knowledge of international business and markets. Delivery time will also be important for logistic services.

7. Conclusions and recommendations (Step 8)

7.1. General assessment

Past reality tells a tough story about European TCL industries: attacked by competitors from Asia, the industry used globalisation as a sheet anchor. In order to survive, it relocated parts of its production to low-cost countries, established global supply chains, and concentrated on marketing rather than production. This was boosted by huge wage differentials and high profits from trade. Production could only sustain in low-cost areas of the European Union and in specialised high-quality market segments. Significant restructuring was needed to transform the industry into competitive production networks, as was the case in Italy and France.

The industry nevertheless lost 40% of its production volume and 40% of its jobs at the same time within a ten year period from 1996. It had to accept continuously rising import shares from low-cost countries – China in particular. The phasing out of the Agreement on Textiles and Clothing in 2005 gave a further push to this trend. Mass-production largely disappeared from high-wage areas in the EU while low-cost areas – the New Member States, Portugal and Greece – could keep at least some parts of TCL production.

World economic crisis

The long-term expectations expressed in the scenarios are questioned by the present world economic crisis, as the scenarios do not include the effects of these – still unpredictable – developments. The crisis is currently affecting private consumption considerably and is going to reinforce the selection process among TCL producers.
The reason for not including the current events, however, is that the scenarios intend to describe the long-term rather than cyclical changes. At some point in time the European economies might return to "normal" trends or even a new growth period. But there are different opinions about when and how this will happen in the future.
The scenarios – and the expectations about employment trends in particular – therefore characterise the long-term effects of industrial transition and changes of global labour division.

With this history, TCL industries appear as the outriders of manufacturing transition. The rising competitiveness of developing countries in a series of industrial markets could hardly be compensated directly. European industries retreated from mass-production, specialising in know-how intensive products, and complex types of production. This, however, was at the expense of considerable job losses.

Certainly, this does not appear to be the end of the story. Developing countries will continue to improve their industrial capacities, invest into their capital basis and logistic infrastructure and – most importantly – strengthen their human capital endowment. China is certainly the most advanced country in this regard. If present trends continue, these countries will be successful in entering additional medium and high-level industrial markets, will contribute to innovation, and will attract larger parts of direct and indirect suppliers. The allocated efficiencies of globalisation seem to be very strong and thus can be expected to have significant impacts on future developments.

All three scenarios, therefore, result in a considerable decline of employment in European TCL industries up to 2020. The minimum calculated in Scenario 3 ("Advanced New Member States") is that one fifth of the 2006 workforce will lose their jobs. The maximum in Scenario 2 ("Asian dominance – European excellence") means half of the employees will become redundant. This is certainly less optimistic than the CEDEFOP/IER forecasts[8]. Nevertheless, scenario 1 ("Globalisation limited") and scenario 3 assume a deceleration of job losses while scenario 2 expects an acceleration.

[8] CEDEFOP/IER assumed a decrease of 1 % annually until 2020. Transformed into annual growth rates the scenarios presented here assume -1.6 % p.a. (Scenario 1 and Scenario 3), and -4.8 % p.a. (Scenario 2).

7.2. Strategic choices

With these expectations the European Union faces the principal choice between the transition into a de-industrialised economy and defending manufacturing production capacities by means of intelligent adjustments in industrial branches. Industrial policies are at the core of these alternatives.

The way to a de-industrialised economy is certainly what present transition trends indicate. As production of manufactured goods – textiles, wearing apparel, leather, leather products and footwear in particular – is less profitable than the production of services – design, innovation, marketing, supply chain management, and retail trade – the growth potentials lie in services. The transition into a service economy, which has been on the way for a long time, follows the economic rationale of international labour division. Liberal global markets are seen as the basis for achieving the economic optima.

Expert panel 9/10 October 2008:
The discussion about the scenarios raised the question how realistic these scenarios could be. It was said that the "globalisation limited" scenario appears to be unrealistic, the "advanced New Member States" scenario lacks the consensus among EU Member States about defending mass-production or certain scenarios are preferable and others not.

Scenarios, however, are not about future „realities". Reality can only be observed in the present. Scenarios are "ideal" worlds which might develop under certain assumptions. They are about the consequences of different drivers and the development paths, which result from choosing certain policy options. They follow these alternatives for some time in the future and try to imagine what would happen if the assumptions became true.

Scenarios, therefore, do not pretend to describe "the one and only future". They are well developed if all of them can be imagined to be one of the future worlds. This is the major difference to forecasting which tries to identify the most probable outcome. Scenarios start from the idea that there are choices about the future, not only drivers.

This, however, appears to be constrictive logic which does not fully account for the external ecological costs of a global economy on the one hand, and the imbalances on European labour markets on the other. These two arguments are the basis for the alternatives to scenario 2 (Asian dominance – European excellence) which extrapolates present trends.

Climate change can be expected to cause enormous costs, which will become evident from increased expenditure on environmental protection or various climate catastrophes. The appearance of environmental costs will transform economic incentives and weaken the advantages of the global labour division. Moreover, environmental disasters may rapidly change public opinion and policy action. They can be expected to change normative reference systems of societies substantially and thus lead to a conversion of economic regimes.

As far as jobs are concerned, rapid industrial change can avoid imbalances on labour markets only if the job potentials of growing sectors are strong enough to absorb human resources from declining industries. The experience from European countries (and the US), however, reveals that this was not the case over the last decades. In liberal economies like the UK or the US, job losses of declining industries were compensated by growth industries only in part. In contrast, a growing low-skill service sector developed and income distribution widened. In welfare-oriented economies like France or Germany, unemployment tended to increase continuously as alternative jobs for redundant workers did not exist. Segmented economies like Italy or Greece finally tolerated the expansion of the black economy.

Facing this experience, the option of defending industrial jobs in Europe is not that far away. Of course, this cannot be done with a conservative approach. Preserving existing jobs appears to be a guarantee for disappearance. However, using the potentials of European economies – existing wage differentials in particular – and creating competitive firms in promising regional clusters appears to be an alternative to the pretended advantages of the global labour division.

None of the scenarios come without a price. While the price of carrying the present regime forward (Scenario 2) lies in neglecting environmental risks and job destruction, the alternative scenarios will curb overall growth. Scenario 1 (Globalisation Limited) will see slower growth due to

the disintegration of the world economy. Scenario 3 (Advanced New Member States) intends to invest in low-productivity sectors and thus depends on low wages.

These negative impacts reveal that the scenarios are real alternatives: Europe has the choice between the continuation of its growth strategy, an ecological economy or a "jobs first" strategy. All three scenarios can hardly be achieved in parallel. At least at EU level the scenarios are exclusive. This, however, does not mean that the Member States might not follow different approaches. In contrast, diversity of approaches reduces the risk of wrong expectations and helps to identify promising strategies. A uniform industrial policy at EU level, therefore, is not intended with this appraisal.

7.3. Developing the knowledge base

Facing strong changes within European TCL industries all scenarios are based on the transformation of the knowledge base by raising investment in education and training.

While TCL industries still have an excellent knowledge base in TCL production and commerce, it is gradually vanishing not only through the declining number of jobs but also through declining training participation and the closure of training centres. Nevertheless, skills shortages appear in many companies even in countries with high unemployment rates. This has to be addressed to the weak competitiveness of TCL companies on labour and training markets. The removal of skills shortages, therefore, strongly depends on job and income perspectives in the sector.

In light of this situation, it is recommended to apply a strongly selective HR policy concentrated on the regional centres of TCL production in Europe, particularly in France, Italy, Portugal, Germany and the New Member States. Public investments in training structures need to be concentrated in order to modernise training. Universities could be at the centre of regional clusters in close cooperation with firms and intermediary training facilities. The goal can only be achieved if training centres are established in regions where TCL industries are developing promising business concepts, are engaged in R&D and have established strong value chains. There needs to be a strong link between employers, training institutions and workers (trade unions).

The New Member States need particular attention as training structures are not fully developed. Beyond engineering and design, companies require strong inputs from professional business specialists who are able to organise the value chain efficiently, undertake convincing marketing initiatives, and optimise human resource management. This should create the basis for a greater independence of TCL companies. National and local governments are particularly stipulated in this respect.

Important segments of TCL training could be:
- Specialty textiles
- Top quality production of garments, leather accessories, shoes
- Process and product innovation
- Interdisciplinary approaches with material science, chemistry, physics, and business administration
- Ecological aspects of TCL production and consumption

Highly qualified engineers, designers, and business professionals are required for this. The critical competences which appeared in the scenarios should be developed:
- Strategic and visionary management
- Intercultural competences in many functions
- Network-based value chain management
- International marketing and branding
- Interdisciplinary and multi-skilled engineering
- Quality-oriented production
- Ecological knowledge as a cross-occupational competence

The returns on investments in human resources strongly depend on complementary factors – R&D investments and regional policies in particular. The concentration of activities in regional TCL clusters, therefore, appears to be essential.

7.4. Innovation strategies

The European Technology Platform – established in 2004 – formulated a new paradigm for the future development of the European textiles and clothing industries (EURATEX 2006). It demanded:

- A move from commodity fibres, filaments and fabrics towards speciality products from flexible high-tech processes.
- The establishment and expansion of textiles as the material of choice in many industrial sectors and new application fields.
- The end of the era for mass manufacturing of textile products, and a move towards a new era of customisation and personalisation of products coupled with intelligent production, logistics, distribution and service concepts.

There is little doubt that highly specialised products are better protected from international competition, usually address clients' needs better than mass products, provide higher shares of value added and above average profit rates, and are located in growing rather than declining markets. But can this be a strategy for a labour force of 3 million?

Obviously it can not. This is a strategy for technological leadership in niche markets, for the creation of a new industry for textile materials and components, for – maybe – a small number of technology leaders, but not for the big consumer markets in the world. Customised and individualised products will certainly have their markets and intelligent types of production, logistics and distribution will help in expanding them. The big consumer markets, however, will continue demanding cheap and standardised products at the lower end of the quality spectrum.

To be polemic: The strategy of the European Technology Platform withdraws from the battlefields of global competition, returning to the shop floors of experiments and innovation, and giving up the major part of its workforce. It is – as EURATEX writes – an "operation as global niche player". Is this the future of the European textiles and clothing industries?

The transition of the European TCL industry into a technology-intensive sector will cost big parts of the labour force. Product innovation will hardly be able to compensate such a loss. Actually, the share of industrial and specialty textiles is 26%. Even if one third of clothing and home textiles production is classified as "high-tech", only half of the textiles production will be left when mass markets are abandoned. Among clothing and leather products, the share of mass produced products is even higher. Assuming that three quarters belong to mass production would mean that only 37% of the present TCL production will survive in the long run – less than was expected in the "Asian dominance – European excellence" scenario.

Innovation, nevertheless, will be a precondition for the survival of European TCL industries. Private investments in the development of specialty textiles should be supported through promoting the cooperation between textiles and other branches like chemistry, construction, and medical science. Machinery producers should contribute to the development of new methods of garment production. Logistic systems should be improved to lower transportation costs. An interdisciplinary approach should be fostered rather than segmented specialisation.

7.5. Regional policies

TCL industries in Europe need a strategy to defend the share in mass consumption markets. The New Member States are those which would be best positioned to compete with the Asian competitors. As this competition is not only driven by labour costs but flexibility and speed of production, by marketing channels and logistics, by high productivity of labour, organisation and machinery, the game is not single tracked. The development of regional TCL clusters – as it was

undertaken by China – might, therefore, help to improve the competitiveness of European mass producers. This requires a low-cost strategy supported by trade unions and workers, a human-capital strategy developing regional labour markets, an efficient organisation of the business environment, and a marketing strategy expanding the sales networks worldwide.

Past experience has shown that escaping from the S-efficiency model is the only way to achieve economic sustainability. As competition among pure subcontractors is price driven rather than quality driven, competence building in design, branding and marketing is pivotal for an escape. The French Val de Loire is a good example of this strategy.

This example also points to the fact that individual companies are hardly capable of achieving a more independent market position. Cooperation and networking are therefore required among regional producers, and public support is needed to implement regional strategies. A selective regional development strategy should be developed which evaluates the economic potential of TCL suppliers, identifies its strengths and weaknesses, implements development programmes and – most importantly – creates the links between actors.

7.6. List of recommendations

The study developed a series of recommendations throughout this text and in particular in this Chapter. They are synthesised in the following Table 26 and addressed to the actors at EU level, national and regional level, to companies and social partners. The list has to be read as the collection of recommendations which arise from the scenarios. Individual items may therefore only be relevant under the condition of one of the three scenarios and may at the same time be counterproductive for the other scenario. It therefore has to be used as the collection of measures which may become relevant, not as a concise strategy for the future.

Table 26 List of recommendations

Topic 1: Industrial policies

EU	• Evaluate alternative industrial policy approaches • Assess alternative regional clusters • Develop a portfolio of alternative policy approaches with Member States
National authorities	• Select the optimal approach • Assess alternative regional clusters • Develop a strategy to safeguard low-skill workplaces
Social partners	• Contribute to the identification of optimal approaches considering economic growth, employment levels and environment

Topic 2: Employment and human resource policies

EU	• Support good practices in restructuring • Support active ageing policies
National authorities	• Reduce non-wage labour costs • Contribute to TCL related human resource investment • Support good practices in restructuring • Support active ageing policies
Companies	• Create a positive image on labour market with the help of leading companies • Improve internal adaptability of the workforce • Preserve the knowledge base by lifelong learning • Set up good HR practices and career path developments to struggle against turnover and attract newcomers in the sector • Build mobility solutions within the sector instead of lay-offs
Social partners	• Support HR policies without early retirement and an effective ageing policy, new career paths • Promote agreements about employment, restructuring, ageing policies

Topic 3: Skills adjustment

EU	• Support training structures in regional clusters • Promote R&D in regional clusters • Create cross-border training networks with companies and training institutions and workers • Support interdisciplinary approaches with material science, chemistry, physics, and business administration • Reinforce new competence standards • Support research on ecological aspects of TCL production and consumption • Promote lifelong learning • Promote exchange of students • Redirect ESF funds towards human capital investments
National authorities	• Concentrate investments in education and training structures (universities) on regional production centres • Develop skills at intermediary levels • Focus on critical competences: – Strategic and visionary management – Intercultural competences in many functions – Network-based value chain management – International marketing and branding – Interdisciplinary and multi-skilled engineering – Quality-oriented production – Ecological knowledge as a cross-occupational competence • Envisage complementary factor to training: R&D, regional policies establish and support training structures in regional clusters • Modernise training • Develop management, marketing, business administration, engineering and design in the NMS • Support branding in the NMS controlling • support cooperation between companies and training institutions

Regional authorities	• Develop regional TCL clusters if appropriate • Envisage complementary factor to training: R&D, regional policies establish and support training structures in regional clusters • Focus on critical competences (see above) • Support cooperation between companies and training institutions
Companies	• Promote lifelong learning • Develop intermediary skills • Preserve learning abilities of the workforce
Social partners	• Reinforce involvement in training issues

Topic 4: Innovation

EU	• Support R&D investments • Support knowledge transfer
National authorities	• Improve interdisciplinary research • Create research centres in regional clusters • Support company based R&D and knowledge transfer
Regional authorities	• Develop regional centres of TCL innovation • Invest into training infrastructure • Consider the high interdependency of the knowledge base with regional economic and social conditions
Companies	• Expand R&D activities • Create R&D networks and improve collaboration
Social partners	• Improve the image of regional clusters • Support networks and improve collaboration

Topic 5: Equal opportunities

Companies	• Provide equal opportunities for men and women in both technical and design oriented tasks • promote women in management positions
Social partners	• support and negotiate agreements about equal treatment of men and women

Topic 6: Regional policies

EU	• Identify and support regional TCL clusters • Focus on NMS • Avoid mainstreaming of development approaches
National authorities	• Identify and support regional TCL clusters • Provide economic and technical research evidence
Regional authorities	• Concentrate resources according to regional conditions • Develop regional labour markets • Develop regional knowledge base
Social partners	• Address employment issues at the local level

Source: Economix

Data Annex

Table A 1 Employment by industry in the EU, USA, Japan and BRICs

Textile industry (ISIC-Rev.3 Chapter 17), 1000 pers.

Country	2000	2006	% annual change	% share of manufacturing in each country	
				2000	2006
EU27	1,478	1,065	-5.3	4.0	3.1
USA 1)	595	390	-8.1	3.2	2.6
Japan 2)	190	170	-3.6	2	1.5
Brazil 3)	468	410	-3.3	5.9	4.4
Russian Federation 4)	906	910	0.1	7.3	7.4
India	-	-	-	-	-
China	-	6,154	-	-	9.7
Mexico 5)	268	225	-2.9	4.6	4.2
Turkey 6)	475	608	4.2	16.7	17.5

Clothing industry (ISIC Rev.3 Chapter 18), 1000 pers.

Country	2000	2006	% annual change	% share of manufacturing in each country	
				2000	2006
EU27	1,857	1,380	-4,8	5,0	4,0
USA 1)	497	260	-12,1	2,7	1,7
Japan 2)	430	360	-5,8	4	3,2
Brazil 3)	684	875	6,4	8,6	9,5
Russian Federation 4)	-	-	-	-	-
India	-	-	-	-	-
China 7)		3,776	-	-	5,9
Mexico 5)	755	608	-3,6	13,1	11,4
Turkey 6)	492	630	4,2	17,3	18,1

Leather industry (ISIC Rev. 3 Chapter 19), 1000 pers.

Country	2000	2006	% annual change	% share of manufacturing in each country	
				2000	2006
EU27	709	546	-4.3	1.9	1.6
USA 1)	69	40	-10.5	0.4	0.3
Japan 2)	50	50	0.0	0	0.5
Brazil 3)	614	745	5.0	7.8	8.1
Russian Federation 4)	145	113	-4.1	1.2	0.9
India	-	-		-	-
China 8)		2,456	-	-	3.9
Mexico 5)	300	229	-4.4	5.2	4.3
Turkey 6)	98	105	1.2	3.4	3.0

1) 2005 for 2006; 2) 2003 for 2000; persons aged 15 years and over; 3) 2002 for 2000; employees of 10 years and over. Excl. rural population, Sep. of each year.; 4) persons aged 15 to 72 years. 1998: Oct. of each year; 5) persons aged 14 years and over. Second quarter of each year. 2005: Break. Methodology revised; data not strictly comparable; 6) persons aged 15 years and over; 7) incl. footwear; 8) excl. footwear

Source: ILO, Eurostat, Economix

Table A 2 Employment by EU Member States

Textiles, clothing and leather industries (NACE 17, 18, 19)
Number of persons employed *

Country	2000	2006	2000-06	2000	2006	2000-06	2000	2006	2000-06
	1000 pers.	1000 pers.	% annual change	% share of EU 27		Difference of % values	% share of manufac-turing		Difference of % values
Belgium	57	41	-5.4	1.4	1.4	0.0	8.4	6.7	-1.7
Bulgaria	165	196	2.9	4.1	6.5	2.5	27.0	29.9	2.9
Czech Republic	154	95	-7.7	3.8	3.2	-0.6	11.2	6.8	-4.4
Denmark	16	9	-9.7	0.4	0.3	-0.1	3.3	2.1	-1.2
Germany	244	171	-5.7	6.0	5.7	-0.3	3.2	2.4	-0.8
Estonia	25	21	-3.1	0.6	0.7	0.1	21.2	15.9	-5.4
Ireland	12	5	-14.4	0.3	0.2	-0.1	4.7	2.2	-2.6
Greece	91	61	-6.4	2.3	2.1	-0.2	21.5	15.4	-6.1
Spain	322	220	-6.1	8.0	7.4	-0.6	12.4	8.5	-3.9
France	273	176	-7.0	6.7	5.9	-0.8	6.8	4.8	-2.0
Italy	822	623	-4.5	20.3	20.8	0.5	17.0	13.8	-3.3
Cyprus	5	2	-11.3	0.1	0.1	0.0	12.4	6.0	-6.5
Latvia	26	22	-3.1	0.6	0.7	0.1	17.1	12.8	-4.3
Lithuania	63	52	-3.1	1.5	1.7	0.2	25.6	19.6	-6.0
Luxembourg	1	1	-0.2	0.0	0.0	0.0	3.9	3.6	-0.3
Hungary	126	72	-8.9	3.1	2.4	-0.7	16.6	9.2	-7.4
Malta	5	3	-6.5	0.1	0.1	0.0	14.5	11.6	-3.0
Netherlands	33	20	-8.1	0.8	0.7	-0.2	3.6	2.6	-1.0
Austria	39	27	-5.7	1.0	0.9	0.0	6.2	4.4	-1.8
Poland	335	268	-3.7	8.3	8.9	0.7	13.9	10.5	-3.4
Portugal	303	241	-3.7	7.5	8.0	0.6	32.3	29.0	-3.3
Romania	506	445	-2.1	12.5	14.9	2.3	27.6	28.0	0.4
Slovenia	43	25	-8.6	1.1	0.8	-0.2	16.8	10.9	-5.9
Slovakia	64	52	-3.5	1.6	1.7	0.1	15.6	12.8	-2.8
Finland	16	11	-6.4	0.4	0.4	0.0	3.6	2.6	-1.1
Sweden	15	10	-7.3	0.4	0.3	-0.1	1.9	1.2	-0.7
United Kingdom	284	124	-13.0	7.0	4.1	-2.9	6.9	4.0	-3.0
EU 25	3,374	2,352	-5.8	83.4	78.6	-4.8	9.8	7.3	-2.5
EU 27	4,046	2,993	-4.9	100.0	100.0	0.0	11.0	8.7	-2.3

* partly estimated on the basis of index values
Source: Eurostat, Economix

Table A 2 continued

Textiles (NACE 17)
Number of persons employed*

Country	2000	2006	2000-06	2000	2006	2000-06	2000	2006	2000-06
	1000 pers.	1000 pers.	% annual change	% share of EU 27		Difference of % values	% share of manufac-turing		Difference of % values
Belgium	43	32	-4.5	2.9	3.0	0.2	6.3	5.3	-1.0
Bulgaria	32	33	0.9	2.1	3.1	1.0	5.2	5.1	-0.1
Czech Republic	69	47	-6.3	4.7	4.4	-0.3	5.0	3.3	-1.7
Denmark	9	6	-7.2	0.6	0.6	-0.1	1.9	1.4	-0.5
Germany	136	99	-5.3	9.2	9.3	0.0	1.8	1.4	-0.4
Estonia	9	9	0.1	0.6	0.8	0.2	7.4	6.7	-0.7
Ireland	7	3	-14.0	0.5	0.3	-0.2	2.7	1.3	-1.4
Greece	29	17	-8.0	1.9	1.6	-0.3	6.8	4.4	-2.4
Spain	112	86	-4.3	7.6	8.1	0.5	4.3	3.3	-1.0
France	122	78	-7.1	8.3	7.4	-0.9	3.0	2.1	-0.9
Italy	305	231	-4.5	20.7	21.7	1.1	6.3	5.1	-1.2
Cyprus	1	1	-6.9	0.1	0.1	0.0	2.8	1.8	-1.0
Latvia	11	7	-6.1	0.7	0.7	0.0	6.9	4.3	-2.7
Lithuania	22	18	-3.8	1.5	1.7	0.2	9.1	6.7	-2.4
Luxembourg	1	1	0.0	0.1	0.1	0.0	3.8	3.5	-0.2
Hungary	33	22	-6.5	2.3	2.1	-0.2	4.4	2.8	-1.6
Malta	-	-	-	-	-	-	-	-	-
Netherlands	21	14	-6.9	1.4	1.3	-0.1	2.3	1.8	-0.5
Austria	21	15	-5.7	1.4	1.4	0.0	3.4	2.4	-1.0
Poland	92	80	-2.1	6.2	7.6	1.4	3.8	3.2	-0.7
Portugal	99	76	-4.5	6.7	7.1	0.4	10.6	9.1	-1.5
Romania	111	77	-6.0	7.5	7.2	-0.3	6.1	4.9	-1.2
Slovenia	16	10	-7.9	1.1	0.9	-0.2	6.1	4.2	-2.0
Slovakia	17	14	-3.4	1.2	1.3	0.2	4.2	3.5	-0.7
Finland	6	4	-6.3	0.4	0.4	0.0	1.4	1.0	-0.4
Sweden	10	7	-6.4	0.7	0.6	0.0	1.3	0.8	-0.4
United Kingdom	142	77	-9.7	9.6	7.2	-2.4	3.5	2.5	-1.0
EU 25**	1,335	954	-5.4	90.3	89.6	-0.7	3.9	3.0	-0.9
EU 27**	1,478	1,065	-5.3	100.0	100.0	0.0	4.0	3.1	-0.9

*partly estimated on the basis of index values
** excluding Malta

Source: Eurostat, Economix

Table A 2 continued

Clothing (NACE 18)
Number of persons employed*

Country	2000	2006	2000-06	2000	2006	2000-06	2000	2006	2000-06
	1000 pers.	1000 pers.	% annual change	% share of EU 27		Difference of % values	% share of manufac-turing		Difference of % values
Belgium	12	7	-8.4	0.6	0.5	-0.1	1.7	1.1	-0.6
Bulgaria	114	141	3.5	6.1	10.2	4.0	18.7	21.4	2.8
Czech Republic	64	38	-8.3	3.5	2.8	-0.7	4.7	2.7	-1.9
Denmark	5	2	-12.3	0.3	0.2	-0.1	1.1	0.6	-0.5
Germany	80	52	-6.8	4.3	3.8	-0.5	1.1	0.7	-0.3
Estonia	14	10	-4.7	0.7	0.7	0.0	11.4	7.7	-3.7
Ireland	4	2	-14.5	0.2	0.1	-0.1	1.7	0.8	-0.9
Greece	53	38	-5.7	2.9	2.7	-0.1	12.6	9.4	-3.2
Spain	140	83	-8.4	7.5	6.0	-1.6	5.4	3.2	-2.2
France	105	66	-7.3	5.6	4.8	-0.8	2.6	1.8	-0.8
Italy	311	234	-4.6	16.8	17.0	0.2	6.5	5.2	-1.3
Cyprus	3	1	-12.2	0.2	0.1	-0.1	7.8	3.5	-4.3
Latvia	14	14	-0.5	0.8	1.0	0.2	9.3	8.2	-1.1
Lithuania	38	32	-2.5	2.0	2.3	0.3	15.4	12.2	-3.2
Luxembourg	-	-	-	-	-	-	-	-	-
Hungary	68	36	-10.0	3.7	2.6	-1.1	9.1	4.7	-4.4
Malta	3	2	-7.6	0.2	0.1	0.0	9.5	7.1	-2.5
Netherlands	9	5	-10.4	0.5	0.3	-0.1	0.9	0.6	-0.4
Austria	11	8	-5.7	0.6	0.6	0.0	1.8	1.3	-0.5
Poland	197	154	-4.1	10.6	11.1	0.5	8.2	6.0	-2.2
Portugal	136	111	-3.3	7.3	8.1	0.7	14.5	13.4	-1.1
Romania	294	269	-1.5	15.8	19.5	3.7	16.0	16.9	0.9
Slovenia	19	10	-10.2	1.0	0.7	-0.3	7.4	4.3	-3.1
Slovakia	30	23	-4.2	1.6	1.7	0.1	7.3	5.8	-1.6
Finland	7	4	-6.7	0.4	0.3	0.0	1.5	1.1	-0.5
Sweden	4	2	-12.5	0.2	0.1	-0.1	0.5	0.2	-0.3
United Kingdom	121	35	-18.5	6.5	2.6	-4.0	3.0	1.1	-1.8
EU 25 *	1,448	970	-6.5	78.0	70.3	-7.7	3.9	3.0	-0.9
EU 27 *	1,857	1,380	-4.8	100.0	100.0	0.0	5.0	4.0	-1.0

*partly estimated on the basis of index values
** excluding Luxembourg

Source: Eurostat, Economix

Table A 2 continued

Leather (NACE 19)
Number of persons employed*

Country	2000	2006	2000-06	2000	2006	2000-06	2000	2006	2000-06
	1000 pers.	1000 pers.	% annual change	% share of EU 27		Difference of % values	% share of manufac-turing		Difference of % values
Belgium	3	2	-6.8	0.4	0.3	-0.1	0.4	0.3	-0.1
Bulgaria	19	22	2.1	2.7	4.0	1.3	3.2	3.4	0.2
Czech Republic	21	10	-10.9	2.9	1.9	-1.0	1.5	0.7	-0.8
Denmark	2	0	-20.4	0.2	0.1	-0.1	0.3	0.1	-0.2
Germany	28	20	-5.1	3.9	3.7	-0.2	0.4	0.3	-0.1
Estonia	3	2	-6.7	0.4	0.3	-0.1	2.4	1.4	-1.0
Ireland	1	0	-17.6	0.1	0.0	-0.1	0.3	0.1	-0.2
Greece	9	6	-5.7	1.3	1.2	-0.1	2.1	1.6	-0.5
Spain	71	52	-5.0	10.0	9.5	-0.4	2.7	2.0	-0.7
France	46	32	-6.0	6.5	5.8	-0.7	1.1	0.9	-0.3
Italy	205	157	-4.3	28.9	28.8	-0.1	4.3	3.5	-0.8
Cyprus	1	0	-15.0	0.1	0.0	0.0	1.9	0.7	-1.2
Latvia	1	1	-12.1	0.2	0.1	-0.1	0.8	0.4	-0.5
Lithuania	3	2	-6.2	0.4	0.3	0.0	1.0	0.7	-0.4
Luxembourg	-	-	-	-	-	-	-	-	-
Hungary	24	13	-9.4	3.4	2.4	-1.0	3.2	1.7	-1.5
Malta	-	-	-	-	-	-	-	-	-
Netherlands	3	2	-10.3	0.5	0.3	-0.1	0.4	0.2	-0.1
Austria	6	4	-5.9	0.9	0.8	-0.1	1.0	0.7	-0.3
Poland	46	34	-5.2	6.5	6.2	-0.4	1.9	1.3	-0.6
Portugal	67	54	-3.5	9.5	9.9	0.4	7.2	6.5	-0.6
Romania	101	98	-0.4	14.2	18.0	3.8	5.5	6.2	0.7
Slovenia	8	5	-6.4	1.1	1.0	-0.1	3.2	2.4	-0.8
Slovakia	17	14	-2.5	2.4	2.6	0.3	4.1	3.5	-0.5
Finland	3	2	-6.1	0.4	0.3	0.0	0.6	0.5	-0.2
Sweden	2	1	-2.3	0.2	0.3	0.0	0.2	0.2	0.0
United Kingdom	21	11	-10.2	3.0	2.0	-1.0	0.5	0.0	-0.5
EU 25 **	589	426	-5.2	83.0	78.0	-5.1	1.7	1.3	-0.4
EU 27 **	709	546	-4.2	100.0	100.0	0.0	1.9	1.6	-0.3

*partly estimated on the basis of index values
** excluding Luxembourg and Malta

Source: Eurostat, Economix

Table A 3 Value added at factor cost by EU Member States

Textiles, clothing and leather (NACE 17, 18, 19)

Country	2000	2006	2000-06	2000	2006	2000-06	2000	2006	2000-06
	million EUR	million EUR	annual change %	% share of EU 27	% share of EU 27	Difference of % values	% share of manufac-turing	% share of manufac-turing	Difference of % values
Belgium	2,347	1,952	-3.0	3.0	3.1	0.1	5.3	3.9	-1.4
Bulgaria	248	504	12.6	0.3	0.8	0.5	13.6	14.6	1.0
Czech Re-public	829	757	-1.5	1.1	1.2	0.1	6.2	3.0	-3.2
Denmark	684	460	-6.4	0.9	0.7	-0.1	2.8	1.7	-1.1
Germany	9,223	7,228	-4.0	11.8	11.4	-0.3	2.3	1.6	-0.7
Estonia	129	164	4.1	0.2	0.3	0.1	15.1	9.3	-5.8
Ireland	358	264	-4.9	0.5	0.4	0.0	1.1	0.8	-0.2
Greece	1,241	1,118	-1.7	1.6	1.8	0.2	8.8	7.8	-0.9
Spain	6,705	5,635	-2.9	8.6	8.9	0.4	6.7	4.3	-2.3
France	9,046	7,014	-4.2	11.6	11.1	-0.4	4.3	3.3	-1.0
Italy	25,475	21,012	-3.2	32.5	33.3	0.7	12.5	9.9	-2.6
Cyprus	69	34	-11.1	0.1	0.1	0.0	7.7	3.2	-4.6
Latvia	119	128	1.2	0.2	0.2	0.1	11.2	8.2	-2.9
Lithuania	229	298	4.5	0.3	0.5	0.2	18.2	10.8	-7.3
Luxembourg	204	190	-1.2	0.3	0.3	-	8.7	6.9	-
Hungary	566	574	0.2	0.7	0.9	0.2	6.0	3.1	-3.0
Malta	95	83	-2.2	0.1	0.1	-	10.4	15.3	-
Netherlands	1,325	948	-5.4	1.7	1.5	-0.2	2.3	1.6	-0.7
Austria	1,508	1,132	-4.7	1.9	1.8	-0.1	4.2	2.5	-1.7
Poland	2,140	1,909	-1.9	2.7	3.0	0.3	6.5	3.5	-3.0
Portugal	3,260	2,693	-3.1	4.2	4.3	0.1	18.0	14.3	-3.6
Romania	1,091	1,375	3.9	1.4	2.2	0.8	17.0	14.0	-3.0
Slovenia	409	369	-1.7	0.5	0.6	0.1	10.6	6.0	-4.7
Slovakia	175	331	11.2	0.2	0.5	0.3	5.7	5.0	-0.7
Finland	564	518	-1.4	0.7	0.8	0.1	1.8	1.6	-0.2
Sweden	571	435	-4.4	0.7	0.7	0.0	1.2	0.8	-0.3
United Kingdom	9,674	6,015	-7.6	12.4	9.5	-2.8	4.0	2.8	-1.1
EU 25	76,945	61,261	-3.7	98.3	97.0	-1.3	5.0	3.6	-1.3
EU 27	78,284	63,139	-3.5	100.0	100.0	0.0	5.1	3.7	-1.3
Non-EU countries (1997 – 2003, based on constant US $ figures):									
		1997-03					1997	2003	1997-03
China		13.5					1.67	2.21	0.54
Japan		-7.0					3.71	2.57	-1.14
USA		-6.6					4.19	2.89	-1.3
* partly estimated on the basis of index values									

Source: Eurostat, Worldbank, Economix

Table A 3 continued

Textiles (NACE 17)

Country	2000	2006	2000-06	2000	2006	2000-06	2000	2006	2000-06
	million EUR	million EUR	annual change %	% share of EU 27	% share of EU 27	Difference of % values	% share of manufac-turing	% share of manufac-turing	Difference of % values
Belgium	1,955	1,638	-2.9	5.1	5.4	0.4	4.4	3.2	-1.1
Bulgaria	63	161	16.9	0.2	0.5	0.4	3.5	4.7	1.2
Czech Re-public	473	525	1.8	1.2	1.7	0.5	3.5	2.1	-1.5
Denmark	398	325	-3.3	1.0	1.1	0.0	1.6	1.2	-0.4
Germany	5,363	4,396	-3.3	13.9	14.6	0.7	1.3	1.0	-0.4
Estonia	53	81	7.2	0.1	0.3	0.1	6.3	4.6	-1.7
Ireland	196	137	-5.8	0.5	0.5	-0.1	0.6	0.4	-0.2
Greece	518	403	-4.1	1.3	1.3	0.0	3.7	2.8	-0.8
Spain	2,896	2,444	-2.8	7.5	8.1	0.6	2.9	1.9	-1.0
France	4,381	2,958	-6.3	11.4	9.8	-1.6	2.1	1.4	-0.7
Italy	11,115	8,783	-3.8	28.8	29.1	0.3	5.4	4.1	-1.3
Cyprus	15	11	-4.0	0.0	0.0	0.0	1.6	1.1	-0.6
Latvia	63	71	2.1	0.2	0.2	0.1	5.9	4.6	-1.3
Lithuania	97	123	4.1	0.3	0.4	0.2	7.7	4.5	-3.2
Luxembourg	202	189	-1.2	0.5	0.6	-	8.7	6.9	-
Hungary	187	198	1.0	0.5	0.7	0.2	2.0	1.1	-0.9
Malta	-	-	-	-	-	-	-	-	-
Netherlands	984	728	-4.9	2.5	2.4	-0.1	1.7	1.2	-0.5
Austria	921	715	-4.1	2.4	2.4	0.0	2.6	1.6	-1.0
Poland	801	856	1.1	2.1	2.8	0.8	2.4	1.6	-0.9
Portugal	1,360	1,098	-3.5	3.5	3.6	0.1	7.5	5.8	-1.7
Romania	262	258	-0.3	0.7	0.9	0.2	4.1	2.6	-1.5
Slovenia	171	174	0.3	0.4	0.6	0.1	4.4	2.8	-1.6
Slovakia	52	98	11.2	0.1	0.3	0.2	1.7	1.5	-0.2
Finland	277	272	-0.3	0.7	0.9	0.2	0.9	0.8	-0.1
Sweden	407	296	-5.2	1.1	1.0	-0.1	0.8	0.6	-0.3
United King-dom	5,347	3,205	-8.2	13.9	10.6	-3.2	2.2	1.5	-0.7
EU 25 **	38,254	29,749	-4.1	99.2	98.6	-0.5	2.5	1.8	-0.7
EU 27 **	38,580	30,167	-4.0	100.0	100.0	0.0	2.5	1.8	-0.7

* partly estimated on the basis of index values

** excl. Malta

Source: Eurostat, Economix

Table A 3 continued

Clothing (NACE 18)

Country	2000	2006	2000-06	2000	2006	2000-06	2000	2006	2000-06
	million EUR	million EUR	annual change %	% share of EU 27	% share of EU 27	Difference of % values	% share of manufac-turing	% share of manufac-turing	Difference of % values
Belgium	296	216	-5.1	1.1	1.0	-0.1	0.7	0.4	-0.2
Bulgaria	156	302	11.7	0.6	1.4	0.8	8.6	8.8	0.2
Czech Re-public	268	152	-9.0	1.0	0.7	-0.3	2.0	0.6	-1.4
Denmark	199	124	-7.6	0.8	0.6	-0.2	0.8	0.5	-0.4
Germany	2,863	2,035	-5.5	10.9	9.3	-1.5	0.7	0.4	-0.3
Estonia	61	71	2.8	0.2	0.3	0.1	7.1	4.0	-3.1
Ireland	140	115	-3.2	0.5	0.5	0.0	0.4	0.4	-0.1
Greece	593	607	0.4	2.2	2.8	0.5	4.2	4.3	0.1
Spain	2,475	2,053	-3.1	9.4	9.4	0.0	2.5	1.6	-0.9
France	3,156	2,811	-1.9	12.0	12.9	0.9	1.5	1.3	-0.2
Italy	8,290	6,925	-3.0	31.4	31.7	0.3	4.1	3.3	-0.8
Cyprus	42	18	-13.0	0.2	0.1	-0.1	4.7	1.7	-3.0
Latvia	53	54	0.3	0.2	0.2	0.0	4.9	3.5	-1.5
Lithuania	119	165	5.5	0.5	0.8	0.3	9.5	6.0	-3.5
Luxembourg	-	-	-	-	-	-	-	-	-
Hungary	282	253	-1.8	1.1	1.2	0.1	3.0	1.4	-1.7
Malta	59	50	-2.7	0.2	0.2	-	6.4	9.2	-
Netherlands	226	127	-9.2	0.9	0.6	-0.3	0.4	0.2	-0.2
Austria	314	265	-2.8	1.2	1.2	0.0	0.9	0.6	-0.3
Poland	1,062	790	-4.8	4.0	3.6	-0.4	3.2	1.4	-1.8
Portugal	1,228	1,095	-1.9	4.7	5.0	0.4	6.8	5.8	-0.9
Romania	638	793	3.7	2.4	3.6	1.2	9.9	8.1	-1.9
Slovenia	150	105	-5.7	0.6	0.5	-0.1	3.9	1.7	-2.2
Slovakia	80	147	10.7	0.3	0.7	0.4	2.6	2.2	-0.4
Finland	193	166	-2.4	0.7	0.8	0.0	0.6	0.5	-0.1
Sweden	109	87	-3.8	0.4	0.4	0.0	0.2	0.2	-0.1
United Kingdom	3,329	2,331	-5.8	12.6	10.7	-2.0	1.4	1.1	-0.3
EU 25 **	25,588	20,762	-3.4	97.0	95.0	-2.0	1.7	1.2	-0.4
EU 27 **	26,382	21,858	-3.1	100.0	100.0	0.0	1.7	1.3	-0.4

* partly estimated on the basis of index values

** excl. Luxembourg

Source: Eurostat, Economix

Table A 3 continued

Leather (NACE 19)

Country	2000	2006	2000-06	2000	2006	2000-06	2000	2006	2000-06
	million EUR	millionEUR	annual change %	% share of EU 27	% share of EU 27	Difference of % values	% share of manufac-turing	% share of manufac-turing	Difference of % values
Belgium	96	99	0.5	0.7	0.9	0.2	0.2	0.2	0.0
Bulgaria	29	41	6.2	0.2	0.4	0.2	1.6	1.2	-0.4
Czech Re-public	89	80	-1.8	0.7	0.7	0.1	0.7	0.3	-0.4
Denmark	87	11	-29.5	0.7	0.1	-0.6	0.4	0.0	-0.3
Germany	998	797	-3.7	7.5	7.2	-0.3	0.2	0.2	-0.1
Estonia	15	11	-4.2	0.1	0.1	0.0	1.7	0.6	-1.1
Ireland	22	12	-9.3	0.2	0.1	-0.1	0.1	0.0	0.0
Greece	130	107	-3.2	1.0	1.0	0.0	0.9	0.8	-0.2
Spain	1,335	1,138	-2.6	10.0	10.2	0.2	1.3	0.9	-0.5
France	1,508	1,245	-3.1	11.3	11.2	-0.1	0.7	0.6	-0.1
Italy	6,069	5,305	-2.2	45.6	47.7	2.2	3.0	2.5	-0.5
Cyprus	13	5	-15.4	0.1	0.0	-0.1	1.4	0.4	-1.0
Latvia	4	3	-2.5	0.0	0.0	0.0	0.4	0.2	-0.2
Lithuania	13	10	-3.9	0.1	0.1	0.0	1.0	0.4	-0.6
Luxembourg **	-	-	-	-	-	-	-	-	-
Hungary	97	123	4.0	0.7	1.1	0.4	1.0	0.7	-0.4
Malta **	-	-	-	-	-	-	-	-	-
Netherlands	116	94	-3.5	0.9	0.8	0.0	0.2	0.2	0.0
Austria	273	152	-9.3	2.1	1.4	-0.7	0.8	0.3	-0.4
Poland	277	263	-0.8	2.1	2.4	0.3	0.8	0.5	-0.4
Portugal	672	500	-4.8	5.0	4.5	-0.5	3.7	2.7	-1.0
Romania	191	323	9.2	1.4	2.9	1.5	3.0	3.3	0.3
Slovenia	88	90	0.4	0.7	0.8	0.2	2.3	1.5	-0.8
Slovakia	43	86	12.0	0.3	0.8	0.4	1.4	1.3	-0.1
Finland	94	80	-2.7	0.7	0.7	0.0	0.3	0.2	-0.1
Sweden	55	53	-0.6	0.4	0.5	0.1	0.1	0.1	0.0
United King-dom	997	478	-11.5	7.5	4.3	-3.2	0.4	0.2	-0.2
EU 25 **	13,102	10,750	-3.2	98.4	96.7	-1.6	0.9	0.6	-0.2
EU 27 **	13,322	11,115	-3.0	100.0	100.0	0.0	0.9	0.7	-0.2

* partly estimated on the basis of index values

** excl. Luxembourg, Malta

Source: Eurostat, Economix

Table A 4 Trade balance by EU Member States

Clothing products (CN Chapter 61+62) million EURO, 2007

Country	Extra EU 27			Intra EU 27			World		
	Import	Export	Balance	Import	Export	Balance	Import	Export	Balance
Austria	804	328	-476	3,002	1,647	-1,356	3,806	1,975	-1,832
Belgium	3,308	209	-3,099	3,070	5,562	2,491	6,378	5,770	-608
Bulgaria	72	94	22	338	1,373	1,035	410	1,467	1,057
Cyprus	23	2	-21	241	9	-232	265	11	-253
Czech Republic	264	57	-207	809	934	126	1,072	991	-81
Germany	13,572	2,661	-10,911	7,819	8,995	1,175	21,392	11,656	-9,736
Denmark	1,683	322	-1,361	1,353	2,259	906	3,036	2,581	-455
Estonia	32	41	9	234	204	-30	266	245	-22
Spain	4,930	1,052	-3,878	4,010	2,850	-1,161	8,940	3,901	-5,039
Finland	302	87	-215	856	138	-718	1,157	225	-932
France	7,088	2,178	-4,909	7,239	5,091	-2,148	14,327	7,269	-7,058
United Kingdom	12,053	999	-11,054	4,615	3,105	-1,511	16,669	4,104	-12,565
Greece	529	108	-421	1,427	799	-628	1,956	907	-1,049
Hungary	88	92	4	619	709	90	708	801	93
Ireland	439	13	-425	1,292	165	-1,127	1,731	178	-1,553
Italy	6,590	7,044	454	4,267	8,468	4,201	10,856	15,512	4,655
Lithuania	54	91	37	227	447	220	280	538	258
Luxembourg	28	8	-20	259	122	-137	287	130	-157
Latvia	32	51	18	192	180	-12	224	231	6
Malta	19	3	-16	56	43	-13	75	46	-29
Netherlands	3,726	277	-3,449	2,905	4,585	1,679	6,631	4,861	-1,770
Poland	508	235	-273	926	1,525	599	1,434	1,760	325
Portugal	97	177	79	1,486	2,430	944	1,584	2,606	1,023
Romania	165	106	-58	511	3,053	2,543	675	3,160	2,484
Sweden	1,247	186	-1,061	1,252	730	-521	2,498	916	-1,582
Slovenia	74	171	98	315	183	-132	389	354	-35
Slovakia	223	33	-190	385	716	331	608	749	141
EU 27	57,951	16,626	-41,325	49,706	56,319	6,613	107,657	72,945	-34,712

Source: Eurostat (Comext), Economix

Table A 4 continued

Leather products (CN Chapter 41-43, 64) in million EURO, 2007

Country	Extra EU 27			Intra EU 27			World		
	Import	Export	Balance	Import	Export	Balance	Import	Export	Balance
Austria	435	271	-164	1,230	924	-306	1,665	1,195	-470
Belgium	1,684	120	-1,564	1,161	3,383	2,221	2,845	3,503	658
Bulgaria	46	13	-34	207	227	21	253	240	-13
Cyprus	24	2	-23	83	4	-79	107	6	-101
Czech Republic	208	57	-151	629	452	-177	837	510	-328
Germany	4,027	1,299	-2,728	4,144	3,555	-588	8,171	4,854	-3,317
Denmark	470	536	65	825	833	8	1,295	1,369	74
Estonia	24	23	-1	134	74	-60	158	97	-61
Spain	1,843	889	-955	1,595	2,057	462	3,438	2,945	-493
Finland	163	243	80	426	209	-217	589	453	-136
France	2,663	2,477	-186	4,143	2,553	-1,590	6,806	5,030	-1,776
United Kingdom	3,613	489	-3,124	2,494	1,249	-1,245	6,107	1,738	-4,370
Greece	436	261	-175	607	118	-488	1,043	379	-664
Hungary	70	45	-25	579	470	-109	649	515	-134
Ireland	104	45	-59	449	152	-296	553	197	-355
Italy	5,726	7,542	1,817	3,494	8,076	4,582	9,220	15,619	6,399
Lithuania	51	15	-36	145	61	-84	196	76	-119
Luxembourg	2	4	2	95	14	-81	97	18	-79
Latvia	20	13	-7	108	27	-81	128	40	-87
Malta	8	0	-7	18	8	-11	26	8	-18
Netherlands	1,706	302	-1,404	1,659	2,800	1,141	3,365	3,102	-263
Poland	255	174	-81	1,044	519	-525	1,299	693	-606
Portugal	199	123	-76	894	1,304	410	1,094	1,427	333
Romania	181	44	-137	1,059	1,519	459	1,240	1,563	323
Sweden	433	111	-322	550	338	-212	983	449	-534
Slovenia	141	106	-35	279	164	-115	420	270	-150
Slovakia	145	84	-61	430	547	117	576	631	56
EU 27	24,676	15,287	-9,389	28,482	31,640	3,157	53,158	46,927	-6,231

Source: Eurostat (Comext), Economix

Table A 4 continued

Textile products (CN Chapters 50-60, 63) in million euros, 2007

Country	Extra EU 27			Intra EU 27			World		
	Import	Export	Balance	Import	Export	Balance	Import	Export	Balance
Austria	392	705	312	1,281	1,566	285	1,674	2,271	597
Belgium	1,582	1,252	-330	2,378	5,463	3,086	3,959	6,715	2,756
Bulgaria	257	76	-181	882	326	-557	1,140	402	-738
Cyprus	23	1	-22	43	1	-42	66	2	-64
Czech Republic	238	250	13	1,897	1,663	-234	2,135	1,913	-222
Germany	4,265	3,978	-288	7,049	9,410	2,361	11,315	13,388	2,073
Denmark	292	199	-93	811	839	27	1,103	1,037	-65
Estonia	78	28	-50	240	124	-116	319	153	-166
Spain	1,605	1,232	-373	2,295	2,130	-164	3,900	3,363	-537
Finland	133	186	53	491	237	-253	623	424	-200
France	1,762	2,056	293	4,715	3,612	-1,102	6,477	5,668	-809
United Kingdom	2,894	1,542	-1,352	3,557	2,780	-777	6,451	4,322	-2,128
Greece	523	315	-208	527	414	-113	1,051	730	-321
Hungary	125	116	-9	964	467	-497	1,089	583	-506
Ireland	110	66	-44	420	234	-187	530	299	-231
Italy	4,317	4,910	593	4,059	7,625	3,566	8,376	12,535	4,159
Lithuania	116	132	16	462	275	-186	577	407	-170
Luxembourg	26	90	64	241	317	77	266	407	141
Latvia	43	77	34	212	89	-124	256	166	-90
Malta	13	20	7	21	22	0	34	42	8
Netherlands	1,227	1,234	7	2,305	3,341	1,035	3,533	4,574	1,042
Poland	729	332	-397	2,964	1,342	-1,622	3,694	1,674	-2,019
Portugal	490	460	-30	1,259	1,237	-21	1,749	1,698	-52
Romania	452	112	-340	2,485	647	-1,838	2,937	759	-2,178
Sweden	430	262	-168	803	551	-252	1,233	813	-420
Slovenia	78	153	75	401	337	-64	478	490	11
Slovakia	90	82	-7	790	473	-317	880	555	-325
EU 27	22,291	19,866	-2,425	43,553	45,523	1,971	65,843	65,389	-454

Source: Eurostat (Comext), Economix

Table A 5 Knowledge intensity indictors

Dimensions of KI	Indicator	Source
Innovation	Business enterprise R&D expenditure (BERD) by economic activity (2000-2007)	EUROSTAT, 2007
	Enterprises with innovation activity by NACE / total enterprises by NACE (2004) (%)	Community Innovation Survey (CIS), 2004
	Enterprises engaged in intramural R&D/ extramural R&D/ total enterprises with innovation activity by NACE (2004) (%)	
	Enterprises with product or process innovation/ total enterprises with innovation activity by NACE (2004) (%)	
	Enterprises with organisational/ marketing innovation/ total enterprises with innovation activity by NACE (2004) (%)	
Employment	Employment in high skilled non-manual occupations (ISCO 1, 2, 3)/ total employment (2000-2007) (%)	CEDEFOP/ IER, 2008
	Business enterprise R&D personnel by economic activity (2000-2007)	EUROSTAT, 2007
Human capital and other knowledge sources	Employment in ISCED 5-6 (high-skill) and 3-4 (medium skill)/ total employment (2000-2007) (%)	CEDEFOP/ IER, 2008
	Enterprises engaged in training/ total enterprises with innovation activity by NACE (2004) (%)	Community Innovation Survey (CIS), 2004
	Enterprises engaged in acquisition of machinery, equipment and software/ total enterprises with innovation activity by NACE (2004) (%)	
	Enterprises engaged in market introduction of innovation / total enterprises with innovation activity by NACE (2004)	
	Highly important source of information for innovation (2004)	
	Enterprises with innovation co-operation during 2002-2004/ total enterprises with innovation activity by NACE (2004)	

Source: Economix

Table A 6 Knowledge intensity of TCL industries by countries

Dimensions of KI	Indicators	High knowledge intensity	Medium knowledge intensity	Low knowledge intensity
	Countries	**Belgium, Germany, Austria, Finland, Sweden and UK**	**France, Netherlands, Spain, Italy, Portugal and Czech Republic**	**Bulgaria, Poland, Estonia, Lithuania, Hungary and Romania**
Innovation	Business enterprise R&D expenditure (BERD) by economic activity (2000-2007)	More than 30 millions of euros. Finland and Sweden are exceptions: around 8 millions of euros. Germany is the biggest investor in R&D in TCL: in 2005, 212.5 millions of euros. In general, decreasing trend of BERD in TCL. There is no data for UK.	Spain and Italy are the second biggest investors in R&D in TCL: around 90 millions of business enterprise expenditure showing an increasing trend during the period. Portugal and Czech Republic: 10 millions, also increasing during 2000-2005/6. There is no data for France.	Around 1 million of euros and a decreasing trend.
	Enterprises with innovation activity by NACE / total enterprises by NACE (2004) (%)	More than 50% of "innovative enterprises" in TCL. (UK: more in Tanning, dressing of leather and manufacture of luggage)	Between 25% and 50% of "innovative enterprises" in TCL. (Spain, Italy and Poland: only in Textiles)	Less than 25% "innovative enterprises" in TCL.
	Enterprises engaged in intramural R&D/ extramural R&D/ total enterprises with innovation activity by NACE (2004) (%)	More than 50% of enterprises with innovation activities are engaged in intramural R&D and more than 25% in extramural R&D.	Around 30% to 50% have intramural R&D and 15% have extramural R&D. France is very closed to the first group. Italy is following with around 50% of enterprises with innovation activities engaged in intramural R&D and about 15% in extramural R&D. Portugal is very close to Italy. Spain is showing a less engagement in intramural R&D (about 30% of enterprises).	About 20% of enterprises engaged in intramural R&D and less than 10% in extramural R&D.
	Enterprises with product and process innovation/ total enterprises with innovation activity by NACE (2004) (%)	More than 50% of the enterprises are engaged in product and process innovation. Although there is a clear predominance of product innovation.	Between 35 and 50% of enterprises are engaged in both innovations. However there is a clear predominance of process innovation (more than 75% of enterprises).	Between 35 and 50% of enterprises are engaged in both innovations. However there is a clear predominance of process innovation (more than 50% of enterprises). Bulgaria and Czech Republic are more engaged in Product innovation

Table A 6 continued

	Enterprises with organisational and marketing innovation/ total enterprises with innovation activity by NACE (2004) (%)	Between 50% and 70% of enterprises introduced both organisational and marketing innovation. However, in general, organisational innovation is predominant.	Between 20% and 50% of enterprises introduced both innovations in Spain, France, Italy and Portugal. In this group, organisational innovations are clearly more significant than marketing innovations.	Between 20% and 50% of enterprises introduced both innovations. Romania shows a clear predominance of organisational innovation. Bulgaria and Poland are expressing a very high and similar presence of both innovations.
Employment	Employment in high skilled non-manual occupations (ISCO 1,2,3)/ difference of % shares 2000-06	+ 5.8%	+5.3%	+4.4%
	Business enterprise R&D personnel by economic activity (2000-2007)	An average of 2 R&D workers by enterprise with innovation activity. Decreasing number in Germany, Belgium, Netherlands and Austria. Germany is the leading country in number of R&D personnel in TCL (around 3000 persons) (very few data available)	An average of 1 R&D worker by enterprise with innovation activity. Increasing number in Czech Republic, Spain and Portugal. Italy and Spain had more than 1500 persons working in R&D in 2003/ 2004. Portugal and Czech Republic had around 500 R&D workers each. (very few data available)	Less than 1 R&D worker (in average) by enterprise with innovation activity. Decreasing number in Poland and Romania (an average of 200 R&D workers in TCL). (very few data available)
Human capital and other knowledge sources	Employment in ISCED 5-6 (high-skill) and 3-4 (medium skill)/ difference of % shares 2000-06	+11.7%	+4.3%	+1.4%
	Enterprises engaged in training/ total enterprises with innovation activity by NACE (2004) (%)	Between 25% and 50%.	Between 25% and 50%. Portugal is leading: more than 60% of the enterprises with innovation activity in textiles and wearing apparel are engaged in training.	Between 25 to 50%. Romania, for instance, shows almost of 50% of enterprises with innovation activities engaged in training. The most exceptional case is Poland, with less than 11% of enterprises with innovation activity in textiles and less than 1% in wearing apparel are investing in training.
	Enterprises engaged in acquisition of machinery, equipment and software/ total enterprises with innovation activity by NACE (2004) (%)	More than 50%.	More than 50%.	More than 50%.

Table A 6 continued

	Enterprises engaged in market introduction of innovation/ total enterprises with innovation activity by NACE (2004) (%)	25% to 35%	20% to 35%	15% to 35%
	Highly important source of information for innovation (2004)	"Within the enterprise and enterprise group" followed by "clients and costumers" (around 50% of enterprises)	"Within the enterprise and enterprise group" (about 35% of enterprises) followed by "suppliers of equipments, materials, components and software" (20% to 25%) – Spain, France and Italy. Portugal is showing a quite different behaviour.	Very similar to the first group, however showing a particular importance of external knowledge sources as "clients and costumers" and "suppliers of equipments, materials, components and software".
	Enterprises with innovation co-operation during 2002-2004/ total enterprises with innovation activity by NACE (2004) (%)	Finland and Sweden – between 25% and 35% of enterprises - especially in Textiles and using a broad range of cooperation. Although we have very few data for TCL industry at UK, it shows a considerable expression of co-operating activities for innovation (between 15% and 20% of enterprises).	Spain, Italy and Portugal: the percentage of enterprises with innovation cooperation during 2002 and 2004 is residual.	At least 15% of enterprises has some sort of collaboration with suppliers, clients and costumers and also with competitors and enterprises of the same sector. Romania is far from this reality.

Source: Economix

Table A 7 Knowledge intensity of TCL industries by sub-sectors

Dimensions of KI	Indicators	High knowledge intensity	Medium knowledge intensity	Low knowledge intensity
	Sectors	**Manufacture of textiles**	**Tanning, dressing of leather and manufacture of luggage**	**Manufacture of wearing apparel; dressing, dyeing of fur**
Innovation	Business enterprise R&D expenditure (BERD) by economic activity (2000-2007)	Highest BERD (at least more than the double of expenditure in others TCL sectors).	Usually the lowest BERD.	Usually more than the BERD in Tanning but expressing a considerable difference to the BERD in Textiles.
	Enterprises with innovation activity by NACE / total enterprises by NACE (2004) (%)	An average of 40%. The "highest innovative" country in Textiles: Germany (72% of innovative enterprises).	An average of 35%. The "highest innovative" country in Tanning and Leather products: Germany (80% of innovative enterprises) followed by UK (69%).	An average of 25%. The "highest innovative" country in Wearing Apparel: Sweden (56% of innovative enterprises).
	Enterprises engaged in intramural R&D/ extramural R&D/ total enterprises with innovation activity by NACE (2004) (%)	In average 50% of enterprises with innovation are engaged in intramural R&D. The "highest R&D engaged" country in Textiles: France (88% of innovative enterprises in TCL engaged in intramural R&D and 38% in extramural R&D)	In average 45% of enterprises with innovation are engaged in intramural R&D. The "highest R&D" countries in Tanning and Leather products: Greece (78% of innovative enterprises in TCL engaged in intramural R&D and 35% in extramural R&D); Slovakia (65% and 35% respectively), Czech Republic and Sweden (around 60% in intramural R&D and between 30% and 40% in extramural R&D). (There is no available data for UK)	In average 35% of enterprises with innovation are engaged in intramural R&D. The "highest R&D" countries in Wearing Apparel: France (78% of innovative enterprises in TCL engaged in intramural R&D but only 16% in extramural R&D) and Sweden (with 71% % of innovative enterprises in TCL engaged in intramural R&D and about 47% in extramural R&D).
	Enterprises with product and process innovation/ total enterprises with innovation activity by NACE (2004) (%)	It does not seem sector dependent but country dependent: in the first group of countries, Textiles enterprises are dominated by product innovation. In the other groups of countries, Textiles seem to be predominantly oriented to process innovation.	The same conclusion for Tanning.	The same conclusion for Wearing Apparel.
	Enterprises with organisational and marketing innovation/ total enterprises with innovation activity by NACE (2004) (%)	A clear predominance of organisational innovations.	Both innovations are equally represented.	Besides the predominance of organisational innovations, this is the sector where marketing innovations are highly been introduced.

Table A 7 continued

Employment	Employment in high skilled non-manual occupations (ISCO 1,2,3)/difference of % shares 2000-06	+1.3%	-3.9%	-5.7%
	Business enterprise R&D personnel by economic activity (2000-2007)	An average of 1.5 R&D workers by enterprise with innovation activity. (very few data available)	Less than 1 R&D worker (in average) by enterprise with innovation activity. (very few data available)	An average of 1 R&D worker by enterprise with innovation activity. (very few data available)
Human capital and other knowledge sources	Employment in ISCED 5-6 (high-skill) and 3-4 (medium skill)/ difference of % shares 2000-06	n.a.	n.a.	n.a.
	Enterprises engaged in training/ total enterprises with innovation activity by NACE (2004) (%)	An average of 45% of enterprises with innovation activity is engaged in training.	An average of 40%.	An average of 45%.
	Enterprises engaged in acquisition of machinery, equipment and software/ total enterprises with innovation activity by NACE (2004) (%)	More than 50%.	More than 50%.	More than 50%.
	Enterprises engaged in market introduction of innovation/ total enterprises with innovation activity by NACE (2004) (%)	Textiles keep the leadership.	Tanning and Wearing Apparel seem very similar. It is interesting to note that Tanning shows a higher % of enterprises engaged in market introduction of innovation in Czech Republic, Germany, Spain, France and Italy, Hungary and Slovakia. There is no data for UK.	In general between 15% and 35% are engaged in market introduction of innovation.
	Highly important source of information for innovation (2004)	"Within the enterprise and enterprise group", "Suppliers of materials, components and software" and "clients and costumers".	"Within the enterprise and enterprise group", "Suppliers of materials, components and software" and "clients and costumers".	"Within the enterprise and enterprise group", "Suppliers of materials, components and software" and "clients and costumers".
	Enterprises with innovation co-operation during 2002-2004/ total enterprises with innovation activity by NACE (2004) (%)	"Suppliers of materials, components and software", "clients and costumers" and "competitors and enterprises of the same sector".	"Suppliers of materials, components and software", "clients and costumers" and "competitors and enterprises of the same sector".	"Suppliers of materials, components and software", "clients and costumers" and "competitors and enterprises of the same sector".

Source: Economix

Table A 8 Employment by occupation and formal education – TCL

%-share of educational group in employment by occupation

Low (Basic schooling, ISCED 1+2)

	EU15			NM10		
	2000	2006	Difference	2000	2006	Difference
Managers	34.7	33.1	-1.5	2.4	1.1	-1.3
Computing professionals, associated prof.	10.3	21.5	11.1	0.0	0.0	0.0
Engineers, associated engineers	11.5	23.4	11.9	3.6	0.5	-3.0
Business professionals, associated prof.	22.7	19.6	-3.1	4.0	0.8	-3.2
Other professionals	19.8	13.1	-6.7	4.5	2.2	-2.3
Office clerks and secretaries	31.4	30.5	-0.9	7.4	4.8	-2.5
Service workers	50.1	38.6	-11.5	6.9	8.9	2.0
Textile, garment and related trades workers	72.3	68.8	-3.6	16.3	11.0	-5.3
Pelt, leather and shoemaking trades workers	82.0	81.0	-0.9	23.4	16.5	-6.9
Other craft related trades workers	54.2	52.8	-1.4	13.4	8.1	-5.3
Textile-, fur- and leather-products machine operators	76.7	72.2	-4.5	32.4	18.6	-13.8
Plant and machine operators, assemblers	66.0	66.6	0.6	29.3	15.4	-13.9
Labourers	72.3	67.6	-4.7	38.7	29.6	-9.1
Total	63.0	57.6		19.4	13.1	

Medium (Upper secondary level, ISCED 3+4)

	EU15			NM10		
	2000	2006	Difference	2000	2006	Difference
Managers	35.6	36.7	1.1	51.0	64.3	13.3
Computing professionals, associated prof.	43.6	55.5	11.9	56.0	61.6	5.6
Engineers, associated engineers	46.8	49.6	2.8	64.4	67.3	2.8
Business professionals, associated prof.	50.4	48.7	-1.7	43.1	45.5	2.4
Other professionals	51.8	51.2	-0.6	72.5	72.3	-0.2
Office clerks and secretaries	58.8	58.6	-0.2	85.8	82.4	-3.3
Service workers	45.3	55.6	10.3	86.3	80.2	-6.1
Textile, garment and related trades workers	24.8	27.0	2.2	80.5	87.5	7.0
Pelt, leather and shoemaking trades workers	16.0	16.4	0.4	74.1	80.9	6.9
Other craft related trades workers	40.3	41.8	1.5	80.0	88.9	8.9
Textile-, fur- and leather-products machine operators	20.8	25.0	4.1	66.0	80.1	14.1
Plant and machine operators, assemblers	30.9	30.8	-0.2	69.7	83.5	13.9
Labourers	26.4	29.0	2.6	58.4	69.2	10.8
Total	29.8	33.2		72.5	81.1	

High (Tertiary level, ISCED 5+6)

	EU15			NM10		
	2000	2006	Difference	2000	2006	Difference
Managers	29.8	30.2	0.5	46.6	34.6	-12.0
Computing professionals, associated prof.	46.1	23.0	-23.0	44.0	38.4	-5.6
Engineers, associated engineers	41.8	27.0	-14.7	32.0	32.2	0.2
Business professionals, associated prof.	26.9	31.7	4.8	52.9	53.7	0.8
Other professionals	28.4	35.7	7.2	23.0	25.5	2.5
Office clerks and secretaries	9.8	10.9	1.1	6.9	12.7	5.8
Service workers	4.6	5.9	1.3	6.9	11.0	4.1
Textile, garment and related trades workers	2.9	4.2	1.3	3.2	1.5	-1.7
Pelt, leather and shoemaking trades workers	2.1	2.6	0.5	2.6	2.6	0.0
Other craft related trades workers	5.5	5.4	-0.1	6.6	3.1	-3.5
Textile-, fur- and leather-products machine operators	2.4	2.8	0.4	1.7	1.4	-0.3
Plant and machine operators, assemblers	3.1	2.7	-0.4	1.0	1.0	0.1
Labourers	1.3	3.4	2.1	2.9	1.3	-1.7
Total	7.2	9.3		8.1	5.8	

Source: Eurostat

Table A 9 Employment by occupation and formal education – Manufacturing

%-share of educational group in employment by occupation

Low (Basic schooling, ISCED 1+2)

	EU15			NM10		
	2000	2006	Difference	2000	2006	Difference
Managers	16.8	16.4	-0.5	2.2	1.7	-0.5
Computing professionals, associated prof.	6.3	5.0	-1.3	1.0	2.6	1.6
Engineers, associated engineers	7.5	7.7	0.1	1.7	0.6	-1.0
Business professionals, associated prof.	14.7	11.4	-3.3	2.2	0.5	-1.7
Other professionals	11.9	11.0	-0.9	2.4	1.3	-1.1
Office clerks and secretaries	25.7	23.6	-2.1	8.1	4.7	-3.4
Service workers	42.1	33.0	-9.1	12.6	8.7	-3.9
Textile, garment and related trades workers	71.0	66.0	-5.0	16.5	10.8	-5.6
Pelt, leather and shoemaking trades workers	80.3	76.2	-4.1	24.3	16.3	-8.0
Other craft related trades workers	40.3	37.7	-2.5	13.2	8.8	-4.4
Textile-, fur- and leather-products machine operators	74.8	69.2	-5.5	32.1	18.4	-13.7
Plant and machine operators, assemblers	53.2	46.6	-6.6	24.9	15.1	-9.8
Labourers	61.3	54.9	-6.5	37.8	28.8	-8.9
Total	58.2	50.5		19.1	12.9	

Medium (Upper secondary level, ISCED 3+4)

	EU15			NM10		
	2000	2006	Difference	2000	2006	Difference
Managers	37.4	36.1	-1.2	48.4	54.0	5.6
Computing professionals, associated prof.	38.1	37.4	-0.7	61.3	57.8	-3.4
Engineers, associated engineers	37.6	40.0	2.4	63.6	55.2	-8.4
Business professionals, associated prof.	48.4	47.1	-1.3	57.4	44.9	-12.5
Other professionals	46.9	48.4	1.5	62.5	67.3	4.8
Office clerks and secretaries	61.4	62.3	0.9	85.1	84.6	-0.5
Service workers	51.8	58.7	6.9	78.1	82.4	4.3
Textile, garment and related trades workers	26.1	29.7	3.6	80.5	87.5	7.0
Pelt, leather and shoemaking trades workers	16.9	20.6	3.7	73.3	81.0	7.7
Other craft related trades workers	52.1	54.0	2.0	83.7	89.6	5.9
Textile-, fur- and leather-products machine operators	22.4	28.0	5.7	66.3	80.3	14.0
Plant and machine operators, assemblers	42.4	47.8	5.3	73.6	83.2	9.6
Labourers	34.9	40.6	5.8	60.3	69.6	9.3
Total	32.0	36.7		72.0	80.4	

High (Tertiary level, ISCED 5+6)

	EU15			NM10		
	2000	2006	Difference	2000	2006	Difference
Managers	45.8	47.5	1.7	49.4	44.3	-5.1
Computing professionals, associated prof.	55.6	57.5	1.9	37.7	39.6	1.9
Engineers, associated engineers	54.9	52.4	-2.5	34.7	44.2	9.5
Business professionals, associated prof.	36.9	41.5	4.6	40.4	54.6	14.2
Other professionals	41.2	40.6	-0.6	35.0	31.4	-3.6
Office clerks and secretaries	12.9	14.1	1.2	6.7	10.7	4.0
Service workers	6.1	8.4	2.2	9.3	8.9	-0.4
Textile, garment and related trades workers	2.9	4.3	1.4	3.0	1.7	-1.3
Pelt, leather and shoemaking trades workers	2.8	3.2	0.5	2.4	2.7	0.3
Other craft related trades workers	7.7	8.3	0.6	3.0	1.5	-1.5
Textile-, fur- and leather-products machine operators	2.8	2.7	-0.1	1.7	1.3	-0.3
Plant and machine operators, assemblers	4.3	5.6	1.2	1.5	1.7	0.2
Labourers	3.8	4.5	0.7	1.9	1.5	-0.4
Total	9.8	12.7		8.9	6.7	

Source: Eurostat

Table A 10 Occupational structure in each industry in the EU Member States

Textiles, clothing, leather, 2000 (TCL employment of country = 100)

Occupation	BE	BG	CZ	DK	DE	EE	IE	GR	ES	FR	IT	CY	LV	LT	LU
Managers	7.0	2.7	3.7	6.1	6.5	13.4	11.1	6.9	4.7	5.0	4.2	5.5	12.6	5.3	
Computing professionals, associated prof.		0.1	0.5		0.6		0.2	0.1	0.3		0.0		2.3		
Engineers, associated engineers	9.2	2.5	2.7	2.9	5.3	2.7	0.4	0.5	1.1	1.6	0.8	1.0	3.4	1.3	
Business professionals, associated prof.	4.1	0.8	0.6		2.8	5.7	2.2	1.0	1.7	3.5	1.9	4.1		1.0	
Other professionals	3.8	3.7	4.9	7.5	6.0	3.8	2.5	1.8	3.5	2.4	4.3	2.9	1.8	2.5	
Office clerks and secretaries	7.0	2.7	4.9	10.1	13.7		9.2	6.4	6.3	9.1	10.0	4.9	2.1	2.3	17.0
Service workers	0.8	2.1	0.5		2.6		1.3	0.7	0.6	1.1	2.9	1.9	6.2	0.6	
Textile, garment and related trades workers	26.9	42.4	38.2	6.5	29.5	19.5	33.7	58.2	16.7	9.5	25.8	17.5	36.0	61.5	11.7
Pelt, leather and shoemaking trades workers	1.0	3.8	3.9	2.8	3.2	1.0	2.5	5.0	6.7	0.9	17.1	3.0		3.4	
Other craft related trades workers	7.1	3.6	6.4	0.7	5.1	5.6	3.8	1.6	3.1	4.9	2.8	0.9	5.4	8.6	
Textile-, fur- and leather-products machine operators	12.2	26.9	23.8	41.2	8.5	36.8	18.4	12.9	47.0	54.5	25.6	42.1	5.7	5.0	28.8
Plant and machine operators, assemblers	3.6	2.6	3.5	5.9	4.7	2.7	9.8	1.9	1.3	3.6	2.1	3.5	12.4	1.3	21.5
Labourers	17.4	6.1	6.4	16.1	11.5	8.9	4.7	2.8	7.1	4.0	2.5	12.8	12.0	7.2	21.0

Occupation	HU	MT	NL	AT	PL	PT	RO	SI	SK	FI	SE	UK	EU15	NM 10	EU27
Managers	3.4	25.1	12.8	4.4		4.9	10.4	4.6	1.5	6.8	6.9	12.5	6.0	4.6	6.1
Computing professionals, associated prof.	0.1		0.5	0.1		0.2	0.0					0.4	0.2	0.2	0.2
Engineers, associated engineers	1.8		1.7	1.4		0.8	0.0	5.4	1.3	5.6	12.0	1.3	1.8	2.0	1.7
Business professionals, associated prof.	1.1		1.8	0.5		0.4	0.0	4.5	0.6	3.9	9.8	2.1	2.0	1.1	1.5
Other professionals	3.1	39.9	10.6	2.1		1.1	50.3	0.7	5.8	9.3	5.4	3.4	3.7	8.9	10.6
Office clerks and secretaries	4.4	17.6	9.9	10.0		5.1	15.0	4.0	3.9	4.7	11.6	11.9	9.2	4.9	8.8
Service workers	0.4	5.9	2.2	1.6		0.9	4.1	0.7	0.4	0.6		1.6	1.8	1.3	2.0
Textile, garment and related trades workers	39.2		16.6	48.2		42.4	0.0	2.1	52.0	19.0	12.6	35.3	28.0	35.7	26.7
Pelt, leather and shoemaking trades workers	7.2			10.4		13.6	0.0	1.2	6.4	3.5	4.8	4.3	9.2	4.0	6.7
Other craft related trades workers	6.3		6.5	5.1		2.6	0.0	4.1	3.7	6.5	10.8	3.3	3.6	4.8	3.4
Textile-, fur- and leather-products machine operators	26.1		21.0	9.2		21.0	0.0	64.3	17.2	30.9	21.3	12.4	26.0	22.5	22.0
Plant and machine operators, assemblers	2.8		6.2	2.1		1.0	0.0	2.8	2.2	1.9	2.8	4.6	2.7	2.5	2.3
Labourers	4.0	11.4	10.3	4.8		6.1	20.2	5.7	5.1	7.3	2.1	7.0	5.9	7.5	8.0

Table A 10 continued

Textiles, clothing, leather, 2006 (TCL employment of country = 100)

Occupation	BE	BG	CZ	DK	DE	EE	IE	GR	ES	FR	IT	CY	LV	LT	LU
Managers	10.1	3.0	5.3	12.6	5.9	9.1	13.4	9.5	8.4	10.0	5.8	7.2	8.4	6.6	
Computing professionals, associated prof.	0.1	0.1	0.4		0.8				0.2	0.3	0.4				
Engineers, associated engineers	7.2	1.8	3.2	4.5	5.0	1.4	0.4	0.1	0.7	5.3	3.9		5.5	2.4	6.0
Business professionals, associated prof.	4.1	1.3	1.7	6.6	5.1	1.8	4.2	1.3	2.8	1.3	2.2	4.2	1.1	4.4	2.4
Other professionals	3.6	1.6	5.9	5.9	6.3	9.2	3.7	3.5	4.3	5.6	5.5	0.6	6.9	3.1	
Office clerks and secretaries	10.0	2.7	5.2	16.2	12.9	3.1	9.4	8.1	6.6	6.8	8.2	3.8	2.5	1.0	10.0
Service workers	1.1	0.9	0.7		3.3	0.3	4.3	1.2	1.2	2.3	2.7			0.7	
Textile, garment and related trades workers	23.8	30.0	30.5	11.8	27.5	10.4	27.1	50.4	22.8	10.7	23.4	33.7	47.0	63.3	3.0
Pelt, leather and shoemaking trades workers	1.4	3.1	1.9		3.9	0.6	0.8	6.2	6.1		13.8	5.0	2.5	1.2	
Other craft related trades workers	4.3	2.6	5.2	4.0	5.9	2.6	5.2	2.2	4.2	6.3	5.5		5.4	4.6	13.4
Textile-, fur- and leather-products machine operators	9.0	41.9	30.8	27.4	8.1	51.1	10.2	12.3	32.5	40.1	21.7	39.3	3.1	5.0	18.0
Plant and machine operators, assemblers	4.7	2.4	6.8	5.2	3.7	2.9	10.0	1.9	2.2	3.8	3.7	1.4	11.2	0.3	47.2
Labourers	20.5	8.5	2.4	5.8	11.6	7.7	11.3	3.3	8.1	7.4	3.2	4.7	6.5	7.4	

Occupation	HU	MT	NL	AT	PL	PT	RO	SI	SK	FI	SE	UK	EU15	NM 10	EU27
Managers	5.6	4.1	8.2	7.0	7.0	4.8	1.3	4.0	3.6	10.1	8.0	16.7	7.7	4.0	6.0
Computing professionals, associated prof.	0.2		2.8	0.3	0.7	0.7	0.2	0.7	0.2	1.0		0.6	0.5	0.3	0.4
Engineers, associated engineers	1.3	2.6	1.7	6.8	2.3	0.8	3.0	10.7	1.0	5.0	3.7	1.3	2.9	2.6	2.8
Business professionals, associated prof.	1.1		7.0	3.7	3.0	0.5	0.1	2.9	0.9	6.1	7.1	5.0	2.7	1.4	2.1
Other professionals	4.0	2.3	5.7	5.2	3.2	1.1	3.6	1.6	6.1	4.1	5.4	5.8	4.7	3.6	4.2
Office clerks and secretaries	4.2	9.7	10.2	6.5	3.3	6.0	2.4	3.1	2.4	5.9	7.3	7.9	8.1	2.9	6.1
Service workers	0.5		2.8	3.8	1.1	0.3	0.7	2.2	0.4	1.1	3.5	2.7	2.1	0.8	1.6
Textile, garment and related trades workers	36.0	8.4	22.2	21.5	54.5	43.7	41.2	10.1	41.1	22.6	17.1	9.7	25.6	41.4	31.0
Pelt, leather and shoemaking trades workers	4.9			4.2	7.1	11.9	3.3	1.1	4.5	3.9	5.1	1.4	7.8	4.0	6.3
Other craft related trades workers	2.7	3.3	4.0	7.5	1.8	2.4	3.9	2.7	3.3	3.1	7.0	5.4	4.8	3.2	4.2
Textile-, fur- and leather-products machine operators	28.8	59.8	17.5	20.1	5.5	16.2	28.3	51.4	25.7	26.7	19.0	22.4	21.6	24.7	23.9
Plant and machine operators, assemblers	4.1	2.9	7.4	2.2	2.3	3.0	5.3	3.9	5.7	2.9	5.0	9.0	3.9	4.0	4.0
Labourers	6.6	7.0	10.5	11.4	8.2	8.5	6.7	5.9	5.1	7.5	11.8	12.2	7.6	7.0	7.4

Table A 10 continued

Textiles, 2000 (employment of country = 100)

Occupation	BE	BG	CZ	DK	DE	EE	IE	GR	ES	FR	IT	CY	LV	LT	LU
Managers	7.7	2.0	3.9	5.6	6.0	4.5	12.7	4.5	4.7	3.8	4.0	5.8	16.6	6.2	
Computing professionals, associated prof.			0.7		0.6		0.4	0.6			0.1		2.0		
Engineers, associated engineers	9.7	4.2	2.6	5.6	4.8	9.5		1.4	2.8	2.1	1.4		6.3		
Business professionals, associated prof.	4.1	1.3	0.6		3.4		1.8	2.1	3.5	3.4	2.2	6.6		2.8	
Other professionals	2.9	8.0	6.1		5.9	3.3	3.2	2.2	5.0	1.3	4.7		1.2	3.3	
Office clerks and secretaries	6.9	2.9	5.5	8.4	13.1		8.4	7.5	8.1	9.9	11.5	6.0	2.3	1.5	19.3
Service workers	1.0	2.3	0.5		1.3		1.6		1.6	0.8	2.3		7.6	1.6	
Textile, garment and related trades workers	25.1	30.2	33.5	12.4	24.0	36.0	28.0	28.0	11.0	6.7	24.6		24.5	49.2	
Pelt, leather and shoemaking trades workers			0.1				0.4	0.6			0.3				
Other craft related trades workers	6.1	7.5	9.1	1.5	8.1	11.9	5.7	4.0	7.5	8.2	3.7		10.1	19.3	
Textile-, fur- and leather-products machine operators	13.3	28.1	25.1	38.1	12.1	22.2	22.5	40.6	45.3	54.3	39.7	61.7	10.7	10.0	32.6
Plant and machine operators, assemblers	3.0	5.4	5.0	12.2	6.7		11.6	3.5	1.2	5.4	2.4		7.1	2.6	24.4
Labourers	20.0	8.1	7.2	16.2	14.1	12.7	3.8	5.0	9.2	4.0	3.0	19.9	11.6	3.5	23.8

Occupation	HU	MT	NL	AT	PL	PT	RO	SI	SK	FI	SE	UK	EU15	NM 10	EU27
Managers	7.7	38.0	12.1	2.9		5.0	11.3	3.7	1.7	6.9	6.7	14.9	6.2	5.5	6.4
Computing professionals, associated prof.			0.8	0.2		0.2						0.7	0.3	0.3	0.2
Engineers, associated engineers	1.8		3.1	2.6		1.1		4.4	2.0	6.8	10.3	2.5	2.7	2.5	2.5
Business professionals, associated prof.	2.3		3.1	0.9		0.3		5.7	0.6	4.6	13.8	1.7	2.6	1.4	2.1
Other professionals	4.9	41.3	7.9	2.1		1.1	49.4	1.4	6.0	12.6	7.5	2.0	3.8	10.8	8.6
Office clerks and secretaries	4.6	20.7	5.5	12.6		5.4	13.3	4.6	5.3	2.6	5.7	11.7	10.2	5.4	9.4
Service workers	1.3		1.3	2.0		1.0	8.0	0.7				1.5	1.5	2.0	2.1
Textile, garment and related trades workers	35.1		20.5	46.7		25.3		2.2	51.8	8.9	14.4	29.8	22.3	29.8	22.2
Pelt, leather and shoemaking trades workers	0.6							0.9				0.3	0.2	0.2	0.1
Other craft related trades workers	12.1		11.5	8.1		6.6		5.1	7.7	13.0	15.2	4.0	6.0	8.8	6.1
Textile-, fur- and leather-products machine operators	19.0		15.2	13.0		47.4		62.3	17.2	35.5	22.5	19.2	33.6	21.7	28.8
Plant and machine operators, assemblers	5.9		9.0	3.2		1.1		3.9	2.0	1.4	4.0	5.4	3.8	3.8	3.5
Labourers	4.6		10.0	5.7		5.6	18.0	5.2	5.5	7.7		6.3	6.9	8.0	7.9

Table A 10 continued
Textiles, 2006 (employment of country = 100)

Occupation	BE	BG	CZ	DK	DE	EE	IE	GR	ES	FR	IT	CY	LV	LT	LU
Managers	9.3	4.0	6.2	13.2	6.8	8.8	14.4	13.5	7.0	10.2	5.5		8.2	8.3	
Computing professionals, associated prof.		0.1	0.1		0.5					0.4	0.7				
Engineers, associated engineers	8.7	2.9	3.9		4.7	1.6	0.5	0.5	0.5	5.4	5.7		6.0	2.3	6.0
Business professionals, associated prof.	3.2	1.9	1.3	4.6	4.0	1.0	3.6	1.7	2.9	1.0	2.2		4.5	5.2	2.4
Other professionals	3.2	2.1	6.9	3.0	4.9	9.5	2.4	2.6	5.1	5.8	5.4		10.1	1.6	
Office clerks and secretaries	8.9	4.4	6.6	9.6	14.1	0.9	11.8	6.6	7.4	7.1	9.8		4.3	0.9	10.0
Service workers	0.9	1.0	1.0		3.1	0.7	1.9	0.5	0.8	2.7	1.7			0.8	
Textile, garment and related trades workers	20.3	34.7	22.2	12.9	22.6	9.7	25.4	24.8	23.7	8.2	19.3	38.8	37.9	52.5	3.0
Pelt, leather and shoemaking trades workers	0.5	0.9			0.3				0.1		0.6			0.3	
Other craft related trades workers	5.3	7.7	8.7	5.7	9.6	6.1	7.0	6.4	7.1	8.5	6.0		9.4	9.9	13.4
Textile-, fur- and leather-products machine operators	10.8	23.3	31.3	31.8	11.8	50.5	14.5	36.0	33.8	41.2	35.9	48.4	6.8	9.0	18.0
Plant and machine operators, assemblers	4.8	4.3	9.1	9.9	5.4	1.5	9.9	2.9	4.3	3.7	4.3		7.8	0.5	47.2
Labourers	24.1	12.6	2.6	9.3	12.2	9.7	8.7	4.5	7.3	5.7	2.8	12.8	5.0	8.7	

Occupation	HU	MT	NL	AT	PL	PT	RO	SI	SK	FI	SE	UK	EU15	NM 10	EU27
Managers	5.1	3.2	10.1	3.9	10.5	5.5	1.7	4.7	8.1	14.3	11.2	15.0	7.9	5.8	6.9
Computing professionals, associated prof.	1.0		3.1	0.3	2.2	1.5	0.3	1.7		1.3		0.9	0.7	0.8	0.6
Engineers, associated engineers	3.4	8.0	2.3	6.5	3.6	0.9	3.5	12.4	2.5	3.7	4.6	1.5	3.7	3.7	3.6
Business professionals, associated prof.	3.0		7.2	4.3	6.2	0.3	0.2	5.5		3.9	7.2	5.6	2.8	2.6	2.6
Other professionals	2.0		3.1	4.5	3.6	1.3	3.4	2.0	9.9	5.0	4.7	4.6	4.5	4.1	4.3
Office clerks and secretaries	7.3	3.7	8.4	7.5	5.4	6.9	2.5	3.3	1.9	2.9	8.9	8.1	9.1	4.1	7.5
Service workers	0.8		1.7	2.7	0.7	0.3	1.5	1.2	1.7	0.5	1.7	3.2	1.8	1.1	1.6
Textile, garment and related trades workers	31.7	10.7	20.6	9.1	33.0	34.6	49.5	8.5	20.8	21.6	10.3	10.9	20.4	36.1	26.0
Pelt, leather and shoemaking trades workers					0.4	0.2	0.2					0.1	0.3	0.2	0.3
Other craft related trades workers	5.9	16.1	4.9	10.6	4.4	5.7	6.8	5.1	6.5	8.0	9.3	8.0	7.2	6.6	7.0
Textile-, fur- and leather-products machine operators	22.9	53.7	15.8	33.7	14.4	31.8	18.6	44.0	37.5	26.2	22.7	22.8	28.9	21.6	26.5
Plant and machine operators, assemblers	7.3		10.4	3.8	5.3	4.9	4.1	5.8	6.6	7.3	8.2	7.4	5.0	5.3	5.0
Labourers	9.6	4.6	12.4	13.1	10.4	6.2	7.8	6.0	4.6	5.3	11.1	11.8	7.8	8.1	8.0

Table A 10 continued

Clothing 2000 (employment of country = 100)

Occupation	BE	BG	CZ	DK	DE	EE	IE	GR	ES	FR	IT	CY	LV	LT	LU
Managers	6.6	2.9	4.1	7.9	7.0	16.1	10.5	7.4	5.3	5.4	4.1	5.4	8.5	5.1	
Computing professionals, associated prof.		0.1	0.3		0.5				0.6				2.8		
Engineers, associated engineers	1.1	2.3	2.7	0.6	6.1		1.0	0.3	0.3	1.2	0.1			2.3	
Business professionals, associated prof.	5.2	0.6	0.2		2.2	5.2	2.7	0.9	0.8	4.9	1.4	4.6			
Other professionals	8.5	2.6	3.2	11.1	7.0	1.2	2.1	2.0	3.6	4.4	4.0	4.3	2.7	2.2	
Office clerks and secretaries	9.9	2.2	4.2	13.9	13.7		10.2	6.7	5.2	8.5	8.5	1.5	1.9	2.4	
Service workers		1.7	0.5		3.5		1.1	0.9	0.2	1.7	4.2	2.9	2.3		
Textile, garment and related trades workers	39.3	50.0	59.5	1.2	43.8	12.5	45.2	74.4	28.8	12.5	46.3	26.4	51.9	74.6	100.0
Pelt, leather and shoemaking trades workers		0.2	0.8		0.4		0.5		0.9		2.5				
Other craft related trades workers	5.3	2.9	2.9		1.3	3.8	1.5	1.2	0.6	2.7	1.3	1.4		2.7	
Textile-, fur- and leather-products machine operators	3.7	27.2	15.3	52.4	3.6	47.3	13.0	2.3	47.0	53.5	23.7	39.9		1.7	
Plant and machine operators, assemblers	7.2	1.8	1.0		2.4	4.6	6.9	1.7	1.2	1.8	1.4	3.6	19.5		
Labourers	13.2	5.5	5.3	13.0	8.5	9.2	5.4	2.3	5.5	3.5	2.3	10.0	10.3	9.1	

Occupation	HU	MT	NL	AT	PL	PT	RO	SI	SK	FI	SE	UK	EU15	NM 10	EU27
Managers	2.9	16.3	12.8	4.6		4.8	10.3	3.1	1.6	7.9	7.4	10.2	6.0	4.4	6.1
Computing professionals, associated prof.	0.2					0.2							0.2	0.1	0.1
Engineers, associated engineers	1.6			0.4		0.5		7.1	0.9	4.8	16.0		1.2	1.9	1.3
Business professionals, associated prof.	0.8					0.4		3.1	0.7	1.8		2.1	1.6	0.8	0.9
Other professionals	3.0	33.6	17.6	3.3		1.1	48.0	0.3	4.9	9.3		5.8	4.1	7.5	14.6
Office clerks and secretaries	3.7		7.1	7.0		4.1	17.2	4.6	3.5	6.4	25.9	11.8	8.2	4.5	8.4
Service workers	0.1	17.1	5.6	1.2		0.8	0.7	0.4	0.7			2.0	2.1	0.8	1.3
Textile, garment and related trades workers	51.8		19.5	75.6		68.1		3.0	68.1	36.2	8.4	50.0	45.8	47.1	36.6
Pelt, leather and shoemaking trades workers	0.8					2.2				3.4	16.6	0.4	1.3	0.3	0.6
Other craft related trades workers	3.9			1.0		1.3		2.7	1.7	1.4		2.1	1.4	2.7	1.6
Textile-, fur- and leather-products machine operators	24.7		33.1	2.5		11.4		66.6	13.4	19.2	18.3	4.1	21.6	20.8	17.1
Plant and machine operators, assemblers	2.2			0.8		1.0		0.8	0.4	1.7		2.6	1.7	1.6	1.3
Labourers	4.3	33.0	4.4	3.6		4.2	23.8	8.4	4.0	7.9	7.4	8.8	4.9	7.6	9.9

Table A 10 continued
Clothing 2006 (employment of country = 100)

Occupation	BE	BG	CZ	DK	DE	EE	IE	GR	ES	FR	IT	CY	LV	LT	LU
Managers	12.6	2.6	3.6	13.2	4.5	9.2	13.1	8.5	9.2	14.0	6.6	9.5	9.2	4.9	
Computing professionals, associated prof.		0.1	0.9		1.2				0.2		0.2				
Engineers, associated engineers	3.1	1.6	2.1	8.9	6.1	1.5	0.3		0.7	5.3	2.6		4.9	2.5	
Business professionals, associated prof.	7.2	1.3	2.0	5.0	6.6	1.2	4.6	1.3	2.3	2.2	2.5	2.9		4.2	
Other professionals	4.6	1.5	3.6	10.2	9.0	9.7	5.1	3.9	4.7	7.3	6.3	1.1	3.9	4.1	
Office clerks and secretaries	13.0	2.4	2.7	21.0	11.9	4.6	7.7	9.6	6.3	6.5	7.7	4.1	2.2	0.8	
Service workers	2.0	1.0	0.4		3.0		6.8	0.8	1.8	3.0	5.0			0.4	
Textile, garment and related trades workers	38.7	31.3	50.4	12.4	41.1	10.9	30.0	66.6	35.1	13.3	40.1	47.0	54.4	70.7	
Pelt, leather and shoemaking trades workers	2.0	1.7	0.9		0.6			0.4	0.9		2.0			0.5	
Other craft related trades workers	0.7	1.5	0.4	2.7	1.6		3.8	1.2	2.3	4.3	3.1		4.1	1.7	
Textile-, fur- and leather-products machine operators	3.6	45.8	29.9	24.2	2.0	53.7	6.1	3.3	29.1	38.9	17.2	33.8	2.1	2.9	
Plant and machine operators, assemblers	3.0	1.8	1.3		1.5	3.8	10.0	1.1	0.4	3.5	3.2		13.4	0.2	
Labourers	9.7	7.5	1.7	2.4	11.0	5.5	12.5	3.2	6.9	1.7	3.4	1.4	5.8	7.0	

Occupation	HU	MT	NL	AT	PL	PT	RO	SI	SK	FI	SE	UK	EU15	NM 10	EU27
Managers	6.1	4.7	3.0	9.7	5.7	3.9	1.1	2.0	2.9	6.0	3.4	19.4	8.1	3.4	5.1
Computing professionals, associated prof.				0.4	0.1	0.1	0.2		0.3	1.2		0.2	0.3	0.1	0.2
Engineers, associated engineers	0.7			6.5	2.1	1.0	3.1	9.2	0.5	6.2	3.2	0.5	2.5	2.4	2.5
Business professionals, associated prof.	0.5		5.1	2.9	1.7	0.9	0.1	1.7	1.7	7.3	6.8	3.7	2.8	1.0	1.7
Other professionals	4.2	3.1	11.5	5.8	2.9	1.0	4.1	1.9	4.2	3.6	8.2	8.6	5.6	3.4	4.4
Office clerks and secretaries	2.9	12.4	18.3	6.5	2.5	6.0	2.4	2.1	2.3	10.7	6.7	8.6	8.0	2.4	5.1
Service workers	0.4		7.4	6.3	1.3	0.5	0.5	1.7	0.1	0.4	9.2	1.7	2.8	0.7	1.7
Textile, garment and related trades workers	45.2	6.1	35.2	48.1	72.3	70.9	46.9	14.2	65.5	33.4	39.7	10.2	42.0	50.9	43.9
Pelt, leather and shoemaking trades workers	1.0			1.6	0.5	0.1	0.1			2.6			0.9	0.6	0.7
Other craft related trades workers	1.3			2.0	0.8	0.1	2.8	0.4	3.0		4.1	0.5	2.0	1.8	2.1
Textile-, fur- and leather-products machine operators	28.4	67.0	16.0	4.1	1.4	6.7	26.7	58.6	12.8	15.8	8.3	26.4	16.3	23.4	23.0
Plant and machine operators, assemblers	3.6				1.0	1.4	6.9	2.5	1.8			7.6	2.4	3.7	3.5
Labourers	5.7	6.7	3.5	6.0	7.6	7.6	5.2	5.8	4.9	12.8	10.4	12.7	6.3	6.2	6.2

Table A 10 continued
Leather 2000 (employment of country = 100)

Occupation	BE	BG	CZ	DK	DE	EE	IE	GR	ES	FR	IT	CY	LV	LT	LU
Managers		3.1	2.1		6.8	20.3	3.1	9.0	3.6	7.7	4.7	5.5			
Computing professionals, associated prof.			0.4		1.1										
Engineers, associated engineers	26.5		2.6		4.7					1.4	0.3	5.5			
Business professionals, associated prof.		0.8	1.5		2.1	19.5	2.9		0.9	0.5	2.0				
Other professionals		4.0	4.6	32.5	3.2	15.2			0.9		3.8				
Office clerks and secretaries		6.6	4.5		15.7		9.7	2.5	5.8	8.8	9.0	16.2		6.7	
Service workers		4.0	0.6		5.4						2.4		46.8		
Textile, garment and related trades workers	12.7	11.6	13.8		5.0	15.3	11.6	6.2	1.2	7.4	2.1				
Pelt, leather and shoemaking trades workers	15.0	36.2	20.8	34.9	26.3	7.3	29.0	49.3	27.8	5.1	67.1	16.4		67.5	
Other craft related trades workers	22.9	1.7	4.5		5.3		2.9		1.4	1.9	3.0				
Textile-, fur- and leather-products machine operators	22.9	22.6	35.4		10.0	22.5	19.1	30.4	49.5	58.4	1.4	33.5		6.7	
Plant and machine operators, assemblers		2.5	3.2		3.8		13.2		1.7	3.3	2.3	6.1		7.5	
Labourers		6.8	5.9	32.5	10.5		8.6	2.5	7.2	5.6	1.9	16.8	53.2	11.7	

Occupation	HU	MT	NL	AT	PL	PT	RO	SI	SK	FI	SE	UK	EU15	NM 10	EU27
Managers	1.5		15.0	8.5		5.2	8.6	9.4	0.9	3.6		8.4	5.5	3.5	5.5
Computing professionals, associated prof.													0.1	0.1	0.1
Engineers, associated engineers	2.3					1.3		3.8	1.2	4.3			1.0	1.7	1.0
Business professionals, associated prof.	0.9					0.6		5.3		7.2		4.3	1.6	1.5	1.3
Other professionals	2.0	50.3	9.0			0.9	60.0		7.9			1.3	2.3	10.0	11.9
Office clerks and secretaries	6.2	49.7	28.0	8.4		7.3	11.7	1.3	3.1	6.9		13.8	9.0	5.6	8.7
Service workers	0.2			1.3		0.9	6.3	1.5		3.9		1.1	1.6	1.6	2.3
Textile, garment and related trades workers	4.8					1.0			12.6	5.1		7.5	3.0	8.0	3.7
Pelt, leather and shoemaking trades workers	32.4			60.9		64.2		4.4	29.7	13.9		39.6	48.0	24.7	36.8
Other craft related trades workers	8.5			3.9				4.9	3.7			4.0	2.5	4.3	2.5
Textile-, fur- and leather-products machine operators	36.6		21.6	10.9		5.7		63.6	26.6	46.3		9.2	17.2	29.8	17.1
Plant and machine operators, assemblers	1.6		6.0	1.4		1.1		4.8	6.9	4.1		7.7	2.6	3.1	2.3
Labourers	2.9		20.3	4.7		11.8	13.4	1.2	7.4	4.7		3.2	5.5	6.1	6.8

Table A 10 continued
Leather 2006 (employment of country = 100)

Occupation	BE	BG	CZ	DK	DE	EE	IE	GR	ES	FR	IT	CY	LV	LT	LU

Managers	12.5	4.1	5.9	4.6	6.0	9.5		7.4	9.3	2.2	5.1	7.5		24.4	
Computing professionals, associated prof.	3.2		0.2		0.7				0.5	0.7					
Engineers, associated engineers	1.0	0.9	2.4	13.2	2.6				0.9	4.9	2.5		9.9		
Business professionals, associated prof.	3.4	1.1	2.7	28.7	5.1	9.3	4.8	0.9	3.4		1.5	10.4			
Other professionals	5.5	1.2	7.4	4.2	4.2	4.3		2.8	2.4	2.0	4.3		28.6		
Office clerks and secretaries	13.5	2.2	6.0	36.6	10.3	3.1		2.4	5.9	6.8	5.8	6.1		5.9	
Service workers		0.5	0.3		5.1			4.5	0.9		0.5			7.6	
Textile, garment and related trades workers	6.3	12.5	12.8		7.0	9.7		3.6	2.5	11.4	0.4			20.0	
Pelt, leather and shoemaking trades workers	18.0	18.3	15.9		31.0	7.3	32.0	52.7	23.9		62.8	20.1	37.9	28.7	
Other craft related trades workers	5.9	2.5	0.6		2.3	3.8			2.1	5.5	8.8		3.7	8.1	
Textile-, fur- and leather-products machine operators	4.5	42.9	31.1	12.6	10.9	36.7	12.9	19.1	35.4	39.6	1.5	44.6		5.3	
Plant and machine operators, assemblers	13.6	3.9	11.1		3.3	2.9	13.0	4.3	1.7	4.7	3.3	5.6			
Labourers	12.7	9.8	3.7		11.4	13.3	37.4	2.2	11.1	22.2	3.6	5.7	19.8		

Occupation	HU	MT	NL	AT	PL	PT	RO	SI	SK	FI	SE	UK	EU15	NM 10	EU27
Managers	4.3		3.6	12.6	5.6	5.4	1.7	8.4	2.0	10.6	1.6	17.6	6.6	3.4	5.1
Computing professionals, associated prof.			8.5			0.7	0.1						0.4	0.1	0.3
Engineers, associated engineers	0.9	12.9		8.4	0.6		2.2	10.4	0.7	5.2		3.0	2.0	1.8	2.0
Business professionals, associated prof.	0.7		10.2	2.9	2.3					7.9	7.0	5.2	2.2	0.8	1.5
Other professionals	6.0		15.3	6.0	3.3	1.0	2.5		7.4	3.4	2.6	3.8	3.1	3.5	3.0
Office clerks and secretaries	4.9		3.7	2.9	3.0	4.0	2.1	5.9	3.0	1.0		3.8	5.8	2.8	4.6
Service workers	0.4			1.8	1.2	0.2	0.4	6.1		4.0		2.9	1.1	0.7	0.9
Textile, garment and related trades workers	6.1	23.8		4.8	8.6	1.0	11.1	1.3	4.1				2.6	9.7	5.6
Pelt, leather and shoemaking trades workers	27.2			27.6	61.7	63.9	18.0	7.3	18.0	15.4	44.3	14.8	42.7	26.4	34.9
Other craft related trades workers	3.1		7.1	8.9	1.0	0.5	3.9	3.1	1.7		1.5	5.6	4.8	2.8	4.2
Textile-, fur- and leather-products machine operators	39.6	8.9	39.5	5.0	5.5	5.1	46.4	48.7	44.0	52.5	24.2	4.6	14.6	36.5	24.7
Plant and machine operators, assemblers	1.2	38.4		0.7	1.7	2.8	1.6	3.1	13.2			25.6	4.0	3.3	3.4
Labourers	5.5	16.0	12.2	18.3	5.6	15.5	10.0	5.8	6.1		18.7	13.0	10.0	8.2	9.7

Source: Eurostat

Table A 11 Employment shares of females by occupation

%-share of females in employment by occupation

Textiles, clothing, leather

	EU15			NM10		
	2000	2006	Difference	2000	2006	Difference
Managers	29.9	31.2	1.3	51.2	48.9	-2.3
Computing professionals, associated prof.	0.6	18.2	17.6	37.3	32.7	-4.6
Engineers, associated engineers	32.2	37.1	4.9	62.7	62.9	0.2
Business professionals, associated prof.	38.6	49.5	10.9	65.9	70.0	4.1
Other professionals	68.1	67.7	-0.4	68.3	87.5	19.1
Office clerks and secretaries	64.8	65.4	0.6	78.3	68.6	-9.7
Service workers	66.4	75.9	9.6	42.7	41.7	-1.0
Textile, garment and related trades workers	79.8	81.6	1.8	93.6	92.7	-0.9
Pelt, leather and shoemaking trades workers	51.6	51.6	0.0	70.7	73.1	2.5
Other craft related trades workers	24.0	29.5	5.5	17.7	13.0	-4.7
Textile-, fur- and leather-products machine operators	63.8	58.2	-5.6	87.1	87.1	0.0
Plant and machine operators, assemblers	28.0	32.9	5.0	39.5	57.2	17.7
Labourers	54.4	53.4	-1.0	67.7	67.0	-0.6
Total	61.3	59.2		77.7	80.4	

Manufacturing

	EU15			NM10		
	2000	2006	Difference	2000	2006	Difference
Managers	18.4	19.2	0.9	22.8	24.0	1.2
Computing professionals, associated prof.*	14.3	13.8	-0.5	27.4	25.8	-1.6
Engineers, associated engineers	11.5	11.8	0.4	21.8	23.6	1.7
Business professionals, associated prof.	29.0	34.0	5.0	51.8	52.3	0.5
Other professionals	47.1	49.1	2.0	56.1	67.9	11.8
Office clerks and secretaries	60.8	60.4	-0.4	71.9	60.5	-11.4
Service workers	69.8	76.7	6.8	50.9	57.1	6.2
Textile, garment and related trades workers	74.0	74.9	0.9	91.5	87.7	-3.8
Pelt, leather and shoemaking trades workers	50.7	48.6	-2.1	69.8	72.5	2.7
Other craft related trades workers	10.5	9.7	-0.8	18.4	16.9	-1.5
Textile-, fur- and leather-products machine operators	62.9	58.5	-4.3	86.9	86.1	-0.8
Plant and machine operators, assemblers	22.2	21.3	-0.9	34.9	33.8	-1.2
Labourers	40.2	37.6	-2.6	48.5	50.9	2.4
Total	28.5	27.0		42.4	39.6	

* estimated value for 2000

Source: Eurostat

Table A 12 Age structure by occupation - TCL
%-share of age group in employment by occupation

age 15-39	EU15			NM10		
	2000	2006	Difference	2000	2006	Difference
Managers	35.3	30.7	-4.6	38.4	33.5	-4.9
Computing professionals, associated prof.	77.6	65.3	-12.3	73.9	74.4	0.6
Engineers, associated engineers	53.7	47.5	-6.1	42.6	42.2	-0.4
Business professionals, associated prof.	53.2	53.6	0.4	58.3	52.5	-5.9
Other professionals	58.5	54.7	-3.9	34.5	51.3	16.7
Office clerks and secretaries	63.0	53.8	-9.2	46.8	51.5	4.8
Service workers	46.0	50.2	4.2	49.4	43.5	-6.0
Textile, garment and related trades workers	54.3	45.4	-8.9	61.5	58.3	-3.2
Pelt, leather and shoemaking trades workers	61.1	48.8	-12.3	57.4	51.8	-5.7
Other craft related trades workers	54.2	45.1	-9.0	46.2	46.6	0.4
Textile-, fur- and leather-products machine operators	56.0	43.0	-13.1	58.4	58.2	-0.2
Plant and machine operators, assemblers	54.0	45.5	-8.5	51.5	57.8	6.3
Labourers	60.0	51.2	-8.8	47.5	54.8	7.3
Total	55.4	46.0		53.9	55.3	
age 40-49	EU15			NM10		
	2000	2006	Difference	2000	2006	Difference
Managers	27.0	31.3	4.3	36.6	35.2	-1.5
Computing professionals, associated prof.	14.3	21.9	7.6	17.1	17.1	0.0
Engineers, associated engineers	26.4	30.2	3.8	40.2	36.6	-3.6
Business professionals, associated prof.	22.6	21.2	-1.4	24.8	22.9	-1.9
Other professionals	25.1	28.3	3.2	49.9	26.9	-23.0
Office clerks and secretaries	23.4	26.0	2.6	37.7	24.5	-13.1
Service workers	28.6	22.6	-6.0	26.8	27.7	0.9
Textile, garment and related trades workers	23.9	29.1	5.3	28.1	28.8	0.8
Pelt, leather and shoemaking trades workers	21.8	27.7	5.9	27.6	33.1	5.5
Other craft related trades workers	23.6	26.4	2.8	30.1	28.0	-2.1
Textile-, fur- and leather-products machine operators	28.0	32.8	4.8	28.5	27.7	-0.8
Plant and machine operators, assemblers	28.2	29.7	1.6	25.3	26.0	0.7
Labourers	20.5	28.0	7.5	36.0	24.0	-12.0
Total	24.9	29.1		31.7	28.4	
age 50+	EU15			NM10		
	2000	2006	Difference	2000	2006	Difference
Managers	37.7	38.0	0.3	25.0	31.3	6.3
Computing professionals, associated prof.	8.1	12.8	4.7	9.0	8.5	-0.5
Engineers, associated engineers	20.0	22.3	2.3	17.2	21.2	4.0
Business professionals, associated prof.	24.3	25.2	1.0	16.9	24.7	7.8
Other professionals	16.4	17.1	0.7	15.5	21.8	6.3
Office clerks and secretaries	13.6	20.2	6.6	15.6	23.9	8.4
Service workers	25.4	27.2	1.8	23.8	28.8	5.0
Textile, garment and related trades workers	21.9	25.5	3.6	10.4	12.9	2.5
Pelt, leather and shoemaking trades workers	17.1	23.5	6.4	15.0	15.1	0.2
Other craft related trades workers	22.2	28.4	6.2	23.8	25.4	1.6
Textile-, fur- and leather-products machine operators	16.0	24.2	8.2	13.1	14.2	1.0
Plant and machine operators, assemblers	17.8	24.7	6.9	23.2	16.1	-7.1
Labourers	19.5	20.8	1.3	16.5	21.2	4.8
Total	19.7	24.8		14.4	16.3	

Source: Eurostat

Table A 13 Age structure by occupation - manufacturing

%-share of age group in employment by occupation

age 15-39	EU15			NM10		
	2000	2006	Difference	2000	2006	Difference
Managers	39.3	32.2	-7.1	35.3	38.7	3.4
Computing professionals, associated prof.	61.7	57.8	-3.9	70.7	72.2	1.5
Engineers, associated engineers	52.8	49.7	-3.1	44.3	44.9	0.6
Business professionals, associated prof.	55.0	51.3	-3.8	53.4	64.1	10.7
Other professionals	53.2	50.0	-3.2	40.6	52.7	12.1
Office clerks and secretaries	55.7	50.2	-5.5	47.5	52.5	5.1
Service workers	57.9	52.1	-5.8	54.3	50.7	-3.6
Textile, garment and related trades workers	54.0	45.6	-8.4	61.3	59.1	-2.2
Pelt, leather and shoemaking trades workers	61.4	49.9	-11.5	56.7	52.0	-4.8
Other craft related trades workers	56.1	50.7	-5.4	53.5	52.3	-1.2
Textile-, fur- and leather-products machine operators	55.8	43.8	-12.0	58.5	58.0	-0.5
Plant and machine operators, assemblers	55.7	49.6	-6.1	53.4	57.2	3.7
Labourers	56.8	50.0	-6.7	54.6	55.7	1.1
Total	54.5	48.8		51.1	53.8	
age 40-49	EU15			NM10		
	2000	2006	Difference	2000	2006	Difference
Managers	28.0	35.4	7.4	37.0	30.5	-6.4
Computing professionals, associated prof.	25.0	30.3	5.2	20.5	17.2	-3.3
Engineers, associated engineers	26.1	27.9	1.8	30.0	27.5	-2.5
Business professionals, associated prof.	24.2	27.5	3.4	28.3	18.5	-9.8
Other professionals	26.7	28.8	2.0	39.8	25.7	-14.1
Office clerks and secretaries	25.4	27.4	2.0	33.9	26.8	-7.0
Service workers	22.9	26.0	3.1	29.1	27.0	-2.1
Textile, garment and related trades workers	24.3	29.7	5.4	28.0	28.1	0.1
Pelt, leather and shoemaking trades workers	21.8	27.6	5.8	29.2	32.6	3.4
Other craft related trades workers	24.5	27.1	2.6	27.8	26.7	-1.1
Textile-, fur- and leather-products machine operators	28.1	32.0	3.9	28.3	27.6	-0.6
Plant and machine operators, assemblers	25.6	29.4	3.8	30.1	25.2	-5.0
Labourers	23.5	27.6	4.1	27.4	24.4	-3.0
Total	25.3	28.6		30.6	26.3	
age 50+	EU15			NM10		
	2000	2006	Difference	2000	2006	Difference
Managers	32.8	32.4	-0.4	27.7	30.8	3.1
Computing professionals, associated prof.	13.2	11.9	-1.3	8.8	10.6	1.8
Engineers, associated engineers	21.1	22.4	1.3	25.6	27.6	1.9
Business professionals, associated prof.	20.8	21.2	0.4	18.2	17.4	-0.9
Other professionals	20.1	21.2	1.1	19.6	21.6	2.0
Office clerks and secretaries	18.9	22.4	3.5	18.7	20.6	2.0
Service workers	19.2	21.8	2.7	16.6	22.3	5.7
Textile, garment and related trades workers	21.7	24.7	3.0	10.6	12.8	2.1
Pelt, leather and shoemaking trades workers	16.8	22.5	5.7	14.1	15.4	1.4
Other craft related trades workers	19.4	22.3	2.9	18.7	21.0	2.3
Textile-, fur- and leather-products machine operators	16.1	24.1	8.0	13.3	14.3	1.1
Plant and machine operators, assemblers	18.7	21.0	2.3	16.4	17.7	1.3
Labourers	19.8	22.3	2.6	18.0	19.8	1.9
Total	20.3	22.6		18.2	19.9	

Source: Eurostat

Table A 14 Part-time employment by EU Member States
Textiles, clothing and leather industries (NACE 17, 18, 19)
1000 persons

Country	2000			2005			2006-2000
	employees	part-time employees	% share of part-time employees	employees	part-time employees	% share of part-time employees	Difference of % values
Belgium	54	-	-	41	6	13.9	-
Bulgaria	153	2	1.1	191	5	2.6	1.5
Czech Republic	139	-	-	-	-	-	-
Denmark	-	-	-	-	-	-	-
Germany	243	32	13.1	171	30	17.4	4.3
Estonia	-	-	-	23	1	4.5	-
Ireland	12	1	8.6	5	1	13.0	4.4
Greece	-	-	-	42	1	1.9	-
Spain	296	5	1.6	223	4	1.6	0.0
France	268	32	12.0	187	23	12.2	0.2
Italy	672	45	6.6	545	47	8.5	1.9
Cyprus	4	0	0.5	2	0	0.3	-0.2
Latvia	26	-	-	22	3	12.7	-
Lithuania	-	-	-	54	7	12.6	-
Luxembourg	-	-	-	-	-	-	-
Hungary	-	-	-	79	12	15.5	-
Malta	4	0	4.3	-	-	-	-
Netherlands	28	6	21.8	17	6	32.5	10.7
Austria	-	-	-	27	4	14.9	-
Poland	315	-	-	246	-	-	-
Portugal	291	3	0.9	-	-	-	-
Romania	488	2	0.4	465	4	0.8	0.3
Slovenia	-	-	-	27	0	1.3	-
Slovakia	-	-	-	-	-	-	-
Finland	15	0	1.8	11	0	1.4	-0.4
Sweden	13	-	-	9	2	18.0	-
United Kingdom	272	38	14.1	133	18	13.3	-0.8
EU 25	-	-	-	2,957	-	-	-
EU 27	3,059	-	-	-	-	-	-

Source: Eurostat, Economix

Table A 15 Part-time employment by EU Member States

Manufacturing (NACE Section D): 1000 persons

Country	2000			2005			2006-2000
	employees	part-time employees	% share of part-time employees	employees	part-time employees	% share of part-time employees	Difference of % values
Belgium	635	-	-	578	72	12.4	-
Bulgaria	566	8	1.5	616	19	3.1	1.7
Czech Republic	1,236	-	-	-	-	-	-
Denmark	476	69	14.5	401	49	12.1	-2.4
Germany	7,520	617	8.2	7,004	771	11.0	2.8
Estonia	118	4	3.6	130	5	3.7	0.1
Ireland	254	8	3.2	215	8	3.9	0.6
Greece		-	-	295	4	1.5	-
Spain	2,429	25	1.0	2,465	31	1.2	0.2
France	3,934	362	9.2	3,662	341	9.3	0.1
Italy	4,017	164	4.1	3,837	224	5.8	1.7
Cyprus	34	0	0.7	34	0	0.8	0.1
Latvia	153	8	5.1	165	17	10.4	5.3
Lithuania	240	-	-	256	27	10.7	-
Luxembourg	34	-	-	37	2	4.4	-
Hungary	753	28	3.7	754	44	5.9	2.1
Malta	29	2	7.0	-	-	-	-
Netherlands	857	117	13.7	725	125	17.3	3.6
Austria	609	39	6.5	598	54	9.1	2.6
Poland	2,290	-	-	2,245	-	-	-
Portugal	889	6	0.7	851	6	0.8	0.1
Romania	1,734	8	0.5	1,609	20	1.3	0.8
Slovenia	242	-	-	223	2	1.1	-
Slovakia	410	-	-	404	5	1.3	-
Finland	428	9	2.1	400	9	2.3	0.2
Sweden	764	-	-	709	66	9.3	-
United Kingdom	3,975	315	7.9	3,138	254	8.1	0.2
EU 25	-	-	-	32,585	-	-	-
EU 27	32,549	-	-	-	-	-	-

Source: Eurostat, Economix

Table A 16 Classification of EU countries

Country	Innovation	Employment share in manufacturing	Specialisation strategies	Training structures	Market segment	Sum
BE	3	2	3	3	3	14
AT	3	1	3	3	3	13
FI	3	1	3	3	3	13
GE	3	1	3	3	3	13
IT	2	2	3	3	3	13
SE	3	1	3	3	3	13
DK	3	1	3	3	3	13
FR	2	1	3	3	3	12
NL	2	1	3	3	3	12
ES	2	2	3	2	2	11
PT	2	3	2	2	2	11
IE	3	1	3	2	2	11
UK	3	1	3	1	2	10
CZ	2	2	2	2	1	9
LT	3	3	1	1	1	9
EE	3	3	1	1	1	9
GR	3	3	1	1	1	9
BG	1	3	1	1	1	7
PO	1	2	2	1	1	7
RO	1	3	1	1	1	7
SL	2	2	1	1	1	7
HU	1	2	1	1	1	6
	3 High 2 Medium 1 Low	3 High 2 Medium 1 Low	3 Specialised brands 2 Mix 1 Sub-contracting	3 well developed 2 developed 1 poorly developed	3 High value added 2 Medium 1 Low value added	

Source: Economix

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