



Restructuring, employment and social dialogue in the chemicals and pharmaceutical industries

**Report for discussion at the
Tripartite Meeting on Promoting Social Dialogue
on Restructuring and its Effects on Employment
in the Chemical and Pharmaceutical Industries
(24–27 October 2011)**

Geneva, 2011

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Abbreviations and acronyms

BAVC	Bundesarbeitgeberverband Chemie e.V. (German Federation of Chemical Employers' Associations)
CEFIC	European Chemical Industry Council
ECEG	European Chemical Employers' Group
EMCEF	European Mine, Chemical and Energy Workers' Federation
EWC	European Works Council
GFA	Global Framework Agreement
ICEM	International Federation of Chemical, Energy, Mine and General Workers' Unions
IFA	International Framework Agreement
IG BCE	Industriegewerkschaft Bergbau, Chemie, Energie (German Mining, Chemical and Energy Industrial Union)
LRC	International Chemical Employers' Labour Relations Committee
M&A	mergers and acquisitions
Mt	metric tonnes
NAFTA	North American Free Trade Agreement
PE	polyethylene
PET	polyethylene terephthalate
PP	polypropylene
R&D	research and development
REACH	Registration, Evaluation, Authorisation and Restriction of Chemicals
TCA	transnational company agreement
UNIDO	United Nations Industrial Development Organization

Introduction

1. The chemical industry is of strategic importance to the sustainable development of national economies. A few figures are sufficient to show the scale of the industry. In 2009, world chemical sales were estimated at €1,871 billion (US\$2,700 billion). Total sales from Asia, European Union countries and the countries belonging to the North American Free Trade Agreement (NAFTA) accounted for 89.7 per cent of world turnover in terms of chemical sales.¹ The ILO estimated, in 1999, that the world chemical industry, not including the pharmaceutical and the rubber and tyre industries, employed over 16 million people.² The ILO estimates that there are up to 20 million people employed in the global chemical, pharmaceutical and rubber and tyre industries today. The ILO has noted the importance of this sector since the early stages of the Organization's activities and has actively promoted social dialogue in the sector for many years.

Context and outline of the report

2. This report examines restructuring and investigates the methods of employer–employee dialogue that have best served in improving industrial relations in the chemical industry. It provides governments, employers and workers in the chemical industry with examples of good industrial relations practices in the context of restructuring, and in particular gives advice on how to improve employer–employee relations. Note that because social partners in the chemical industry at the ILO also represent the rubber and tyre industries, information from these industries is also included in the report.
3. The context and outline of the report are as follows:
 - Chapter 1 reviews recent mergers and acquisitions (M&A) in the chemical industry on a global scale in order to identify their main characteristics.
 - Chapter 2 looks at some primary external factors that influence restructuring in the chemical industry and provides models showing how chemical firms carry out the restructuring process.
 - Chapter 3 examines how restructuring affects jobs and conditions of work in the chemical industry, in particular its impact on employment, wages and working time.
 - Chapter 4 explores the impact of restructuring on workers in the context of industrial relations.
 - Chapter 5 examines the role of social dialogue in times of restructuring. It examines why and how it should be carried out, what issues must be addressed, and what is best practice in social dialogue in the chemical industry.

¹ European Chemical Industry Council (CEFIC): *Facts and figures 2010* (Brussels).

² ILO: *Report on sectoral activities in 2002–03 and progress in the implementation of the programme for 2004–05*, Governing Body document GB.289/STM/1, 289th Session, March 2004 (Geneva), p. 19.

Background to the meeting

4. This meeting is part of the ILO's Sectoral Activities Programme, the purpose of which is to facilitate the exchange of information among constituents on labour and social developments related to particular economic sectors, complemented by practical research on topical sectoral issues. This objective has traditionally been pursued by holding international tripartite sectoral meetings to exchange ideas and experiences with a view to fostering a broader understanding of sector-specific issues and problems, promoting an international tripartite consensus on sectoral concerns and providing guidance for national and international policies and measures to deal with the related issues and problems, promoting harmonization of all ILO activities of a sectoral character, and acting as a focal point between the Office and its constituents, and providing technical advice, practical assistance and concrete support to ILO constituents in their efforts to overcome problems in ensuring decent work throughout the sectors concerned. (Further information on the meeting is available at www.ilo.org/sector.)
5. At the 304th Session of the Governing Body (March 2009), the ILO's constituents selected *Promoting social dialogue on restructuring and its effects on employment in the chemical and pharmaceutical industries* as the topic for this tripartite sectoral meeting. At this session, it was also decided to invite ten Employer and ten Worker representatives, after consultation with their respective groups in the Governing Body, and to invite representatives from the government of any ILO member State that indicated its wish to attend.³ At the 310th Session of the Governing Body (March 2011), it was decided that five additional Employer and five additional Worker representatives, selected after consultation with their respective groups, be invited to attend the meeting.⁴
6. The purpose of the meeting, as decided by the Governing Body, is to examine the best social dialogue practices to facilitate a constructive and conducive atmosphere during structural changes and M&A; to adopt conclusions that include proposals for action by governments, by employers' and workers' organizations, and by the ILO; and to adopt a report on its discussions.

³ Opening sectoral meetings to representatives of all member States is part of a range of measures to improve the relevance and impact of sectoral activities in the ILO. Others include the collection, analysis and dissemination of relevant information on best practices, such as this report.

⁴ GB.310/14(Rev.).

1. Recent M&A in the chemical industry

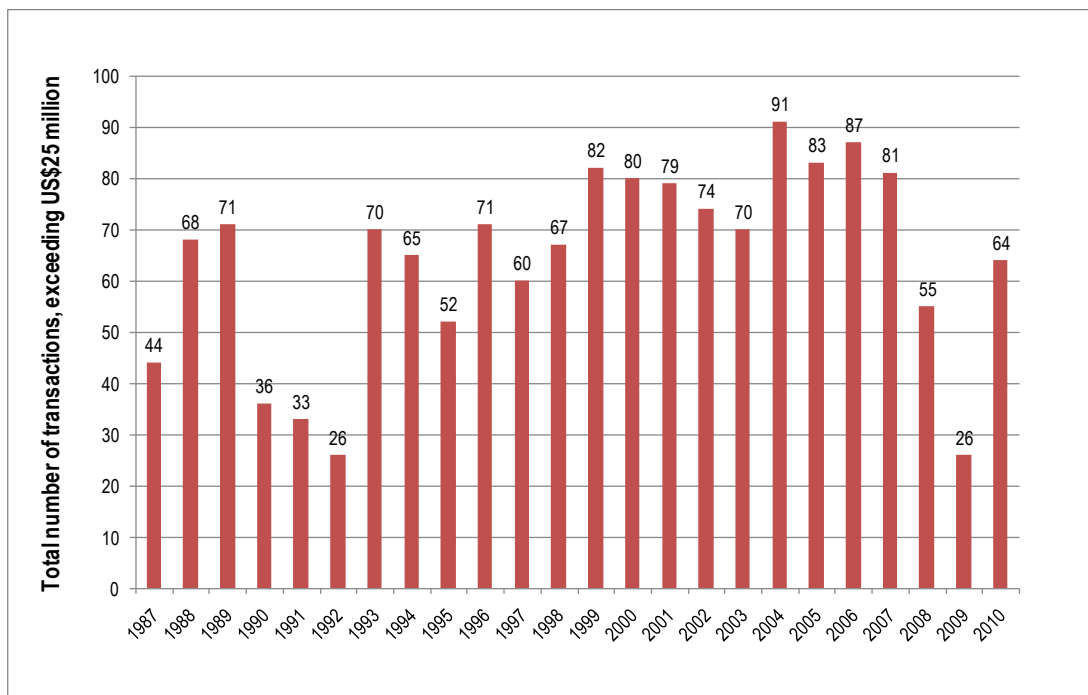
7. The evolution of the chemical industry is to some extent a history of M&A. Many names of chemical firms no longer exist as a result of M&A. In the past decade, several of the chemical industry's most venerable and notable names have faded away through M&A: Ciba Specialty Chemicals, ICI, Rohm and Haas, and Union Carbide were among the once leading names that have either disappeared or have been reduced to brand names by their acquirers. The present chapter reviews M&A activity in the chemical industry.

1.1. Evolution of M&A in the chemical industry

8. M&A activities in the chemical and pharmaceutical industries show increases in terms of the number of transactions and of equity. All figures on M&A transactions include only those exceeding US\$25 million (megamergers), which are publicly disclosed.
9. Figure 1.1 shows the number of M&A transactions in the world chemical industry between 1987 and the third quarter of 2009. Between 1999 and 2007, the volume of transactions shows a steady increase, averaging between 70 and 80 megamergers per year. However, in 2008 and 2009, M&A transactions declined worldwide because of the global economic crisis. The total equity value of transactions increased prior to the recent economic crisis, and in 2007 the total equity value of transactions peaked at US\$54 billion. Since 2007, the number of transactions and their value has declined (figure 1.2). A chemical M&A firm, Young and Partners, reported that the number of M&A transactions in the chemical industry has gradually increased since 2009. In the first half of 2011, in equity value, US\$40 billion of transactions were completed. This exceeded US\$39 billion for the whole of 2010.¹
10. In the pharmaceutical industry, the number of megamergers worldwide has been constantly increasing in the past two decades. After a record high of 46 transactions in 2007, a cooling in the number of M&A transactions worldwide was seen in 2008 and 2009 (figure 1.3). The M&A dollar value peaked in 2000. Since 2000, no single transaction has exceeded US\$100 billion (figure 1.4).
11. Since the early 2000s, the number of biotechnology M&A transactions worldwide has also been constantly increasing. At its peak in 2006, 25 megamergers were reported (figure 1.5), with a dollar value of around US\$10 billion. Since 2006, the number of transactions has declined and the value remains relatively low, but steady, in terms of the number of transactions (figure 1.6).

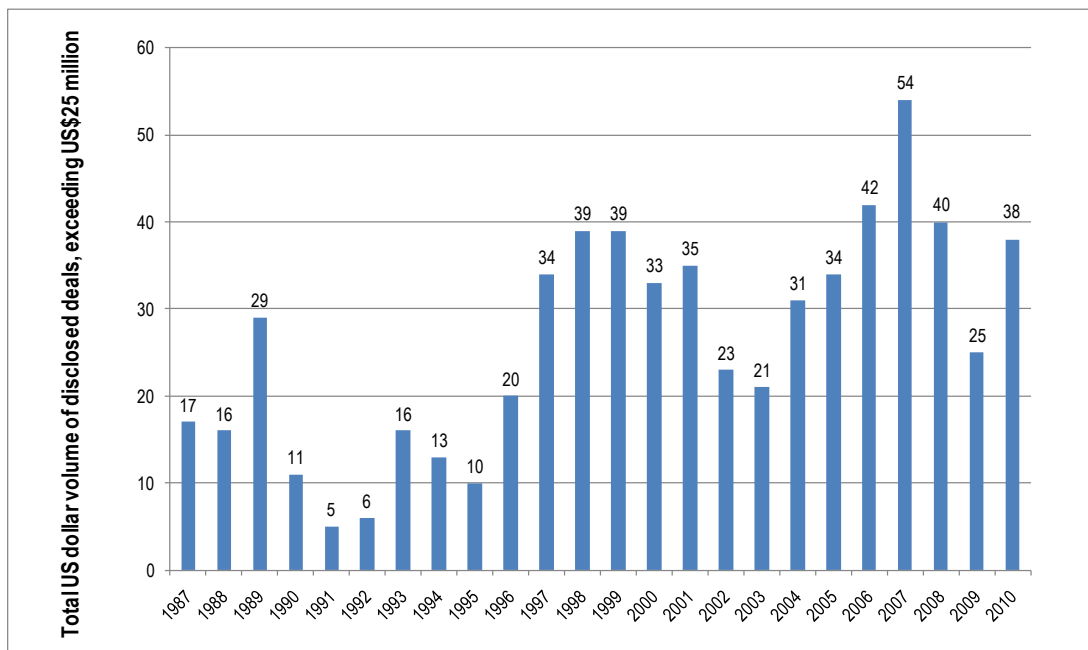
¹ "Mergers and acquisitions", in *ICIS Chemical Business* (Sutton Surrey), 15–28 August 2011, pp. 16–17.

Figure 1.1. Number of M&A transactions in the world chemical industry, 1987–2010



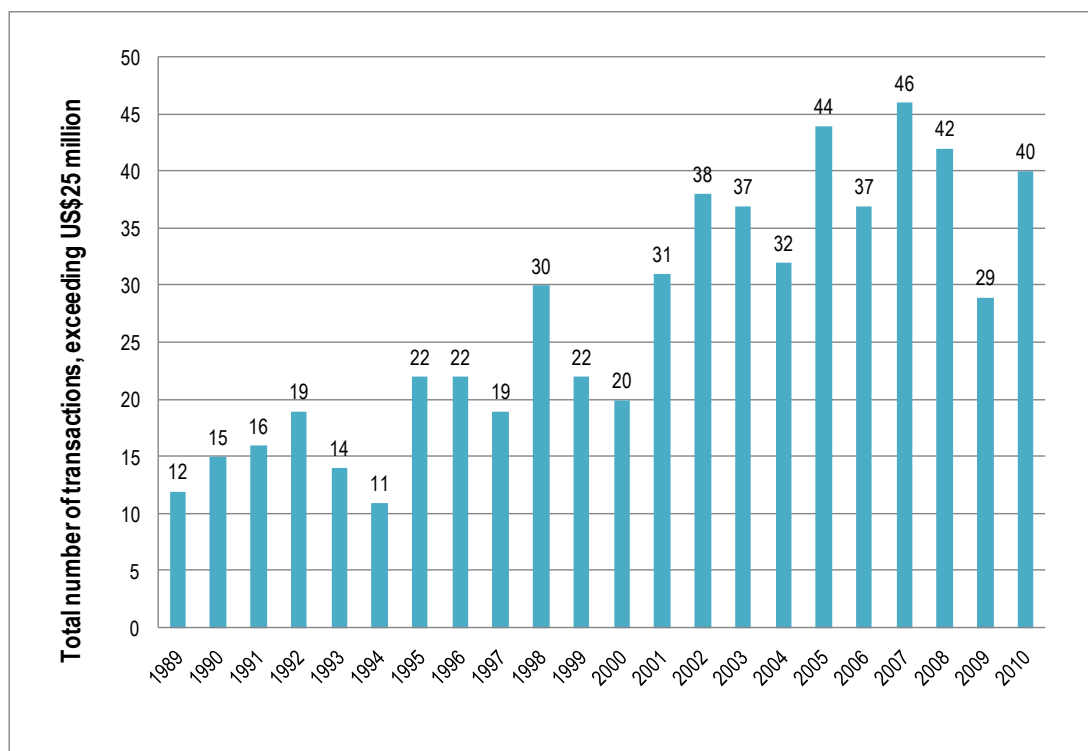
Source: Young & Partners LLC (New York, NY).

Figure 1.2. Equity value of M&A in the world chemical industry, 1987–2010 (US\$ billion)



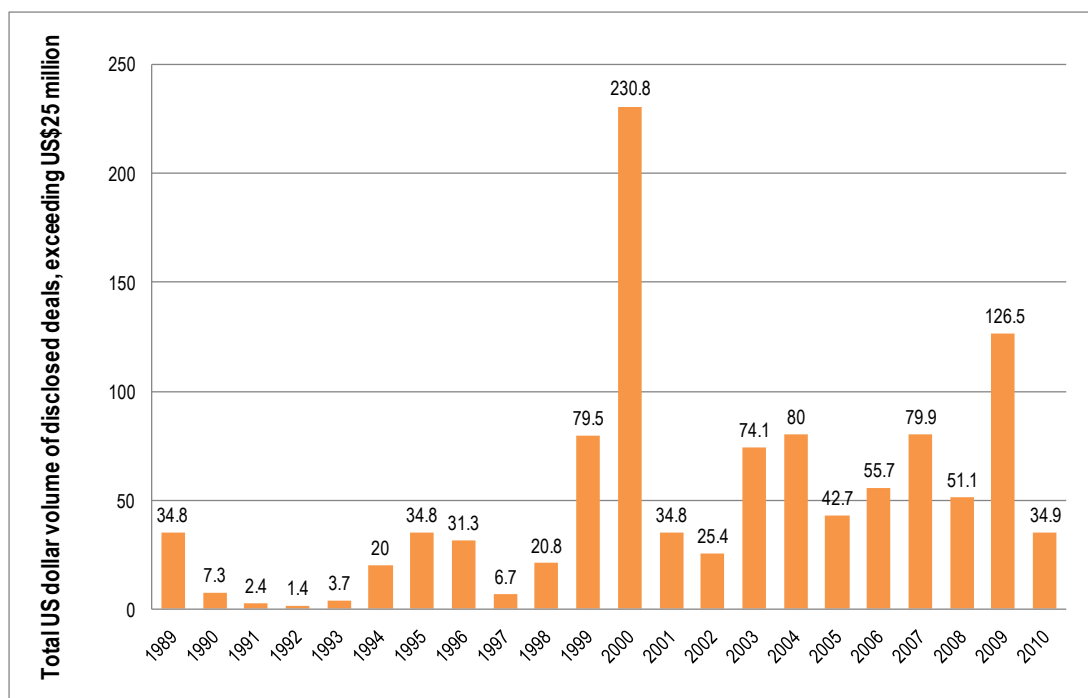
Source: Young & Partners LLC (New York, NY).

Figure 1.3. Number of M&A transactions in the world pharmaceutical industry, 1989–2010



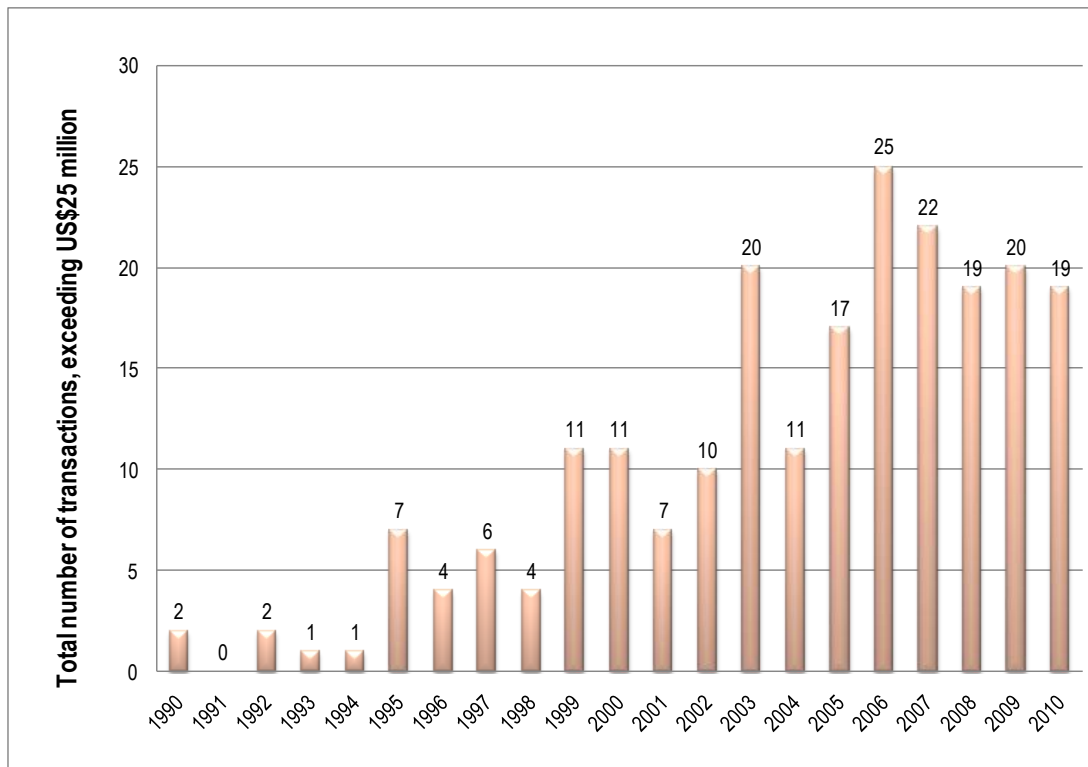
Source: Young & Partners LLC (New York, NY).

Figure 1.4. Equity value of M&A in the world pharmaceutical industry, 1989–2010 (US\$ billion)



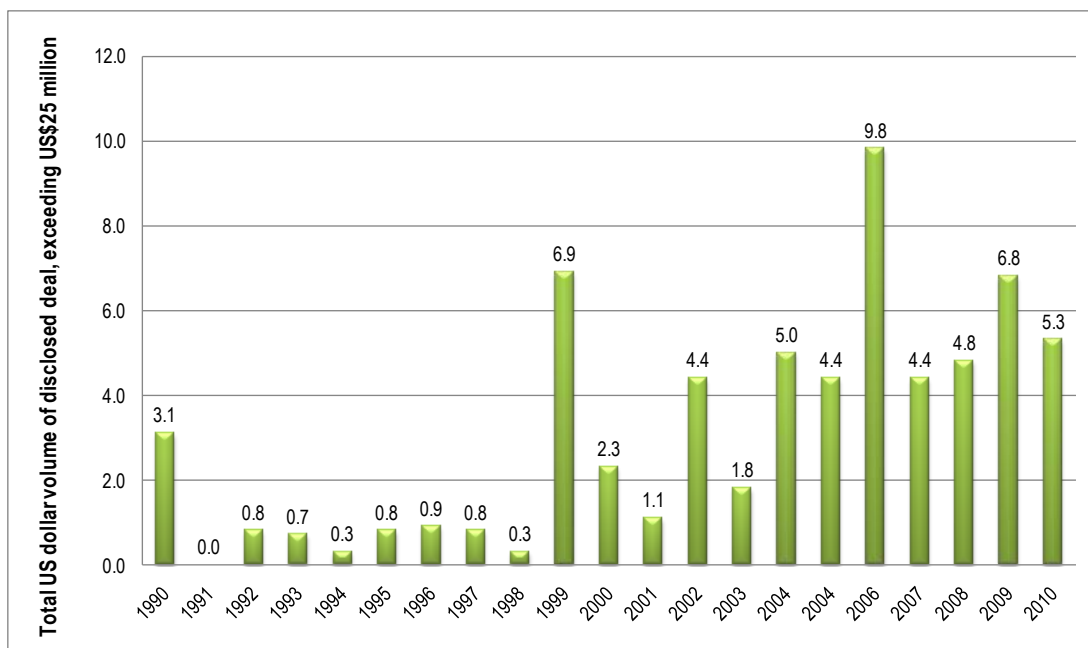
Source: Young & Partners LLC (New York, NY).

Figure 1.5. Number of M&A transactions in the world biotechnology industry, 1990–2010



Source: Young & Partners LLC (New York, NY).

Figure 1.6. Equity value of M&A in the world biotechnology industry, 1990–2009 (US\$ billion)



Source: Young & Partners LLC (New York, NY).

12. As a result of M&A, the chemical sector represents the largest percentage share of real value added in the overall manufacturing industry. The long-term trends in the sectoral structure of the global manufacturing industry are presented in table 1.1. Data are expressed in real terms of real value added, for 30 selected countries in the developed and

developing world. The structure of manufacturing production in these countries shows a strong rise in the value-added shares of industries producing chemicals and chemical products, rubber and plastics products, machinery and equipment not classified elsewhere, electrical machinery and apparatus, and medical, precision and optical instruments, at the expense of other industries. The chemicals and chemical products sector shows the largest increase in percentage in overall manufacturing share of real value added, from 8.7 per cent in 1970 to 12.0 per cent in 2006.

Table 1.1. Structure of the manufacturing industry, selected 30 countries, 1970–2006

ISIC code	Industry	1970	1980	1990	2000	2006
15	Food and beverages	13.6	12.7	12.0	11.6	11.9
16	Tobacco products	2.5	2.1	1.6	1.4	1.0
17	Textiles	5.0	4.1	3.4	2.5	1.9
18 + 19	Wearing apparel, fur + leather, leather products and footwear	3.9	3.5	3.0	2.0	1.3
20	Wood products (excluding furniture)	3.5	2.4	2.1	1.8	1.7
21	Paper and paper products	4.2	3.8	3.9	3.7	3.5
22	Printing and publishing	5.1	4.7	4.8	4.6	4.1
23	Coke, refined petroleum products, nuclear fuel	2.9	2.5	2.3	2.2	2.3
24	Chemicals and chemical products	8.7	9.5	10.3	11.0	12.0
25	Rubber and plastics products	3.4	3.6	4.3	4.7	4.5
26	Non-metallic mineral products	4.9	4.6	4.1	3.7	3.7
27	Basic metals	6.8	5.4	4.4	4.3	4.4
28	Fabricated metal products	9.6	8.4	7.4	7.0	6.6
29 + 30	Machinery and equipment n.e.c. + office, accounting and computing machinery	5.8	10.9	11.2	10.5	10.9
31 + 32	Electrical machinery and apparatus + radio, television and communication equipment	4.6	8.3	9.8	11.6	11.2
33	Medical, precision and optical instruments	1.8	2.2	3.1	3.5	4.0
34 + 35	Motor vehicles, trailers, semi-trailers + other transport equipment	10.0	8.0	8.9	10.7	11.6
36	Furniture; manufacturing n.e.c.	3.8	3.4	3.5	3.3	3.2
	Total manufacturing	100.0	100.0	100.0	100.0	100.0

Note: n.e.c. = not elsewhere classified.

Source: O. Memedovic: *Structural change in the world economy: Main features and trends*, Working Paper 24/2009 (Vienna, UNIDO, 2010), p. 13.

1.2. From cross-border M&A to megamergers

13. Cross-border M&A transactions have become standard business practice in the chemical industry. An early wave of cross-border M&A took place in the 1970s and 1980s. In the 1970s, the world economy experienced unprecedented upheaval as a result of the oil shocks of 1973 and 1978–79, which brought about a tenfold hike in the price of crude oil. Weak demand for durables and consumer goods hit the chemical industry hard. Some firms responded by restructuring, others by diversifying their product portfolios. Subsequently, the value of inventories surged and product prices soared. High energy prices triggered inflation. Chemical companies began to experience uncertainty, accelerated by the industry's cyclical behaviour and the emergence of new producers in developing economies.

-
14. In the 1980s, chemical industry restructuring took two forms. The first was an attempt to consolidate specific industry segments, which would reduce the number of players and shut down uncompetitive plants and increase operating rates. The second entailed change of a broader scope, with some long-term participants in the industry deciding to get rid of some or most of their petrochemical operations and to look for more attractive businesses.
 15. The European chemical industry is an example of a reduction in the number of competitors in a limited market. In the 1980s, it was characterized by a number of structural disadvantages. The average size of petrochemical plants in Europe was substantially smaller than that of comparable plants in North America, resulting in higher fixed costs per pound of output. The national policies of each European country encouraged petrochemical industry overcapacity.² During the 1980s, cross-border M&A in the chemical industry became the norm in restructuring.
 16. By contrast, in North America there was no significant cross-border M&A activity until recently. Petro-Canada, the Canadian energy and petrochemicals firm, bought US-based El Paso's stake in Coastal Petrochemicals for around 92 million Canadian dollars (CAD) (€58 million), including working capital and post closing adjustments. Coastal Petrochemicals, based in Montreal, Canada, has a paraxylene unit that supplies Interquisa's purified terephthalic acid facility. Petro-Canada, in turn, supplies mixed xylenes to Coastal from its Montreal refinery.³
 17. The most successful companies in Central and Eastern Europe tend to be those that have themselves undergone major restructuring, such as the Hungarian oil and gas company MOL. These companies have built up considerable expertise on restructuring post-communist companies effectively. The energy sector has drawn significant recent M&A activity from three main regional players: Poland's PKN Orlen, Austria's OMV and Hungary's MOL. PKN Orlen bought 494 service stations in northern Germany from BP in 2002 and is completing the purchase of a 63 per cent stake in Czech petrochemicals company Unipetrol. OMV bought a 51 per cent stake in Romania's SNP Petrom in 2004. MOL holds a majority stake in Slovakia's Slovnaft and a 25 per cent stake in Croatia's INA, as well as upstream assets in the Russian Federation and Kazakhstan.⁴
 18. Hungarian chemical producers have been expanding their production in pursuit of a dominant position in Central and Eastern Europe. Hungary's two major chemical companies, BorsodChem and TVK, are increasing production capacity and improving cost efficiency in order to enhance their competitiveness. With an investment of 80 billion Hungarian forints (HUF) (around US\$423 million) by 2006, BorsodChem will raise its annual PVC capacity to 400,000 tonnes and vinyl chloride monomer (VCM) capacity to 350,000 tonnes; it also plans to increase its methylene diphenylene diisocyanate (MDI) and toluene diisocyanate (TDI) outputs to 140,000 tonnes and 80,000 tonnes, respectively. TVK spent a total of €430 million (US\$476 million) on the construction of a new ethylene cracker with a capacity of 250,000 tonnes and a high-density polyethylene plant with

² P.H. Spitz (ed.): *The chemical industry at the Millennium: Maturity, restructuring, and globalization* (Philadelphia, PA, Chemical Heritage Press, 2003), pp. 9–50.

³ "Petro-Canada buys stake", in *European Chemical News* (Wageningen), 4–10 Apr. 2005, p. 8.

⁴ "Eastern Europe: CEE firms target Balkans potential", in *Oxford Analytica* (Oxford), 12 May 2005.

annual capacity of 200,000 tonnes. These expansion plans were meant to boost TVK's capacity and size before Hungary's accession to the European Union.⁵

19. However, not all deals today are necessarily successful. For example, Poland is still struggling to pursue a privatization plan for its chemical sector because of the global economic crisis. In August 2009, PKN Orlen postponed the sale of PVC and nitrogen subsidiary Anwil. The company had planned to raise around US\$2 billion from the sale of Anwil to invest in Orlen Transportation and a 25 per cent stake in Polkomtel. Many Central Eastern European (CEE) economies suffered from the global economic crisis. Hungary's deep economic malaise has been reflected in the results of the country's national chemical firm TVK, the chemicals business of energy giant MOL. Sales slumped from US\$2.3 billion in 2007 to US\$1.7 billion in 2008, while operating profits slumped from US\$236 million to US\$24 million.⁶ Although information on M&A in the Russian Federation is limited, it is reported that the Federal Anti-Monopoly Service has approved a merger between Soda Sterlitamak and Caustic Sterlitamak in Sterlitamak.⁷
20. Brazil and Mexico dominate the Latin American chemical industry. The Brazilian chemical giant, Braskem, is actively acquiring chemical interests in Brazil and Mexico. In 2008, Braskem reported sales of US\$7,670 million, followed by Petróleos Mexicanos (PEMEX), which has the petrochemical business at PPQ (PEMEX Petroquímica), with sales of US\$5,870 million. The total sales of these companies accounted for around half the total sales in Latin American chemical companies. Braskem has been seeking the acquisition of Quattor, created in June 2008, following a major restructuring of the Brazilian petrochemical sector, and this would help it achieve its goal of becoming one of the world's ten largest petrochemical companies. Braskem is also considering investing in Mexico, where plans to build a large-scale petrochemical project were being considered. The Brazilian group has joined Mexican companies Alpek, Mexichem and IDESA to form a consortium that planned to bid for an ethane supply contract with PEMEX. In Mexico, Alpek, the petrochemical business of the ALFA industrial group, started a polypropylene (PP) plant in Altamira, Mexico. It also completed the integration of two polyethylene terephthalate (PET) plants it acquired in 2007 in Argentina and Mexico. The PP plant is part of Alpek's Indelpro PP joint venture with LyondellBasell. Mexichem's 2008 revenues were boosted by acquisitions that included Brazilian PVC pipe producer Plastubos.⁸ In 2010, Braskem and the Bolivarian Republic of Venezuela's state-owned petrochemical company Pequiven reached an agreement to evaluate a new model for creating a joint venture of PP and polyethylene (PE) businesses in the Bolivarian Republic of Venezuela.⁹ Braskem is also investing US\$50 million in the US polypropylene sites.¹⁰

⁵ "Hungary: Chemical firms have ambitious expansion plans", in *Oxford Analytica* (Oxford), 9 Sep. 2003.

⁶ W. Beacham: "Global impact", in *ICIS Chemical Business* (Sutton, Surrey), 21–27 Sep. 2009, pp. 18–20.

⁷ "Russian caustic soda players to merge", in *ICIS Chemical Business* (Sutton, Surrey), 28 Feb.–6 Mar. 2011, p. 9.

⁸ A. Jagger: "Global impact", in *ICIS Chemical Business* (Sutton, Surrey), 21–27 Sep. 2009.

⁹ K. Sissell: "Braskem and Pequiven scale back Venezuela projects", in *Chemical Week* (London and New York, NY), 3 May 2010, p. 10.

¹⁰ A. Jagger: "Braskem invests in US polypropylene sites", in *ICIS Chemical Business* (Sutton, Surrey), 4–10 Oct. 2010, p. 26.

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- 21.** In Asia, too, M&A activity is on the increase, although most capital investment is still limited to within national borders. In the Republic of Korea, LG Chem and Honam Petrochemical bought Hyundai Petrochemical for 1,740 billion South Korean won (KRW) (US\$1.45 billion) in early 2003.¹¹ Hyundai Petrochemical split into three companies, with LG Chem and Honam Petrochemicals each operating one of the company's two complexes based in the city of Daesan, and jointly holding stakes in a separate utilities company. Honam owns Lotte Daesan Petrochemical and took control of No. 2 Complex at Daesan, which includes a 600,000 tonnes per year cracker. LG Chem owns LG Daesan Petrochemical and has control of No. 1 Complex, which includes a 450,000 tonnes per year cracker, an EO/EG plant, a PP plant, a low-density PE unit, a linear low-density polyethylene (LLDPE) facility, a high-density PE unit and a styrene plant.¹²
- 22.** Recent M&A transactions in Japan show that the Japanese chemical firms are taking advantage of M&A to acquire key technologies and production of mainly specialist chemicals in order to strengthen their portfolios by entering into promising new areas. In 2001, Kuraray acquired polyvinyl butyral (PVB) production in Germany from the acquisition of Clariant's business. The company is focusing on developing core materials businesses such as vinyl-acetate materials, isoprene chemicals and man-made leathers to create and expand new business. Mitsui Chemical and other Japanese firms are targeting M&A to boost specialty businesses. In 2008, Mitsui Chemical acquired SDC Technologies in the United States, which manufactures and sells high-performance coating materials for plastics and non-ferrous material.¹³ In 2008, Mitsubishi Rayon acquired Lucite International. Between 2010 and 2011, Asahi Kasei and Mitsubishi Chemical created a joint venture, to be implemented from 1 April 2011, for unified cracker operations at Mizushima. Mitsui Chemical and Japanese refiner Idemitsu Kosan integrated ethylene production at Chiba. Mitsui Chemical and Teijin merged PET operations. Although cultural issues have made it difficult to implement M&A in Japan in the past, a changing corporate culture in the past ten years has gradually led to more reasonable M&A arrangements.¹⁴
- 23.** The 1990s were the decade of megamergers. For example, in 1997, the merger between Sandoz and Ciba created Novartis. With a market value of US\$80 billion, the merger was the world's largest at the time. It had a lasting effect, particularly on the European chemical industry. Several megamergers are listed in table 1.2.

¹¹ "LG Chem and Honam take over Hyundai", in *European Chemical News* (Wageningen), 3–9 Feb. 2003, p. 7.

¹² "Hyundai Petrochemical splits", in *European Chemical News* (Wageningen), 15–21 Nov. 2004, p. 6.

¹³ R. Westervelt: "Japan: Sustaining recovery in chemicals", in *Chemical Week* (London and New York, NY), 12–19 May 2008, pp. 20–24.

¹⁴ M. Hariharan: "Japanese chemical industry reinvents itself to counter pressures from the Middle East and China", in *ICIS Chemical Business* (Sutton, Surrey), 18–24 Oct. 2010, pp. 35–36.

Table 1.2. Megamergers in the pharmaceutical industry, 1989–2009

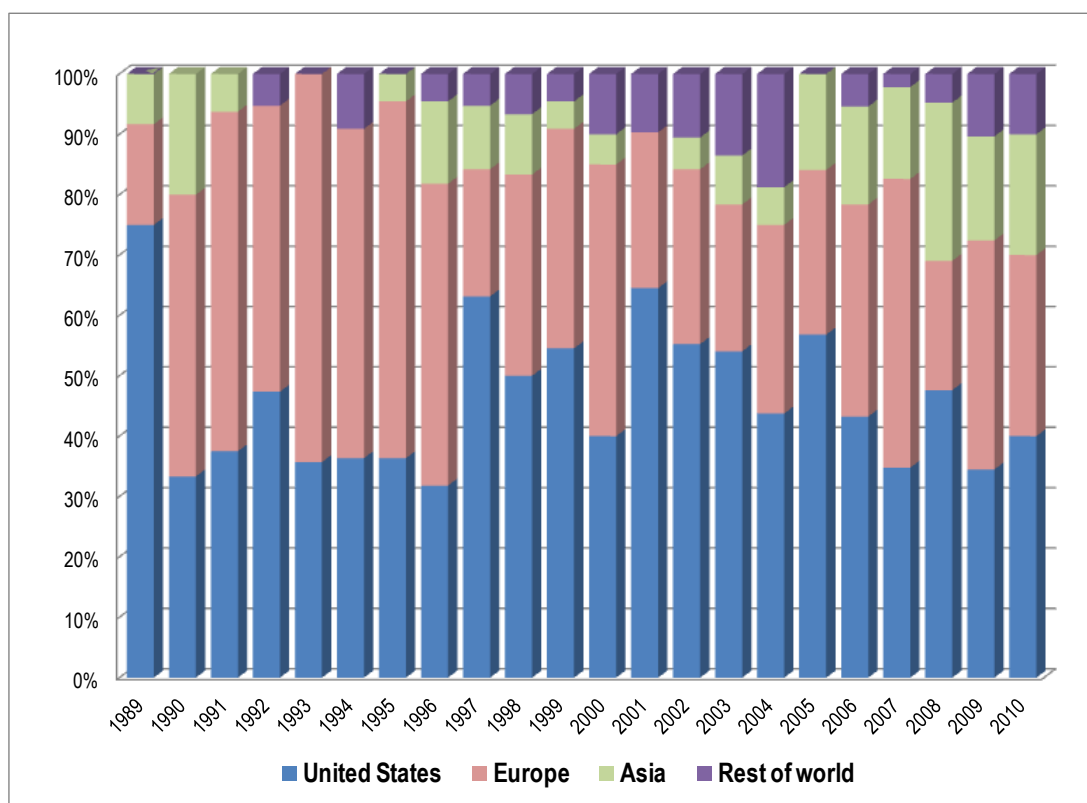
Year	Merging firms	Transaction volume (US\$ billion)
1989	Beecham – SmithKline	7.9
1994	Roche – Syntex	5.3
1995	Glaxo – Wellcome	14.2
1995	Upjohn – Pharmacia	13.0
1997	Sandoz – Ciba (Novartis)	30.1
1997	Roche – Boehringer Mannheim	11.0
1998	Sanofi – Synthelabo	11.1
1999	Astra – Zeneca	37.2
1999	Hoechst – Rhone – Poulenc (Aventis)	21.5
1999	Pharmacia Upjohn – Monsanto	27.0
2000	Glaxo – SmithKline Beecham	75.8
2000	Warner – Lambert – Pfizer	111.8
2004	Aventis – Sanofi – Synthelabo	71.3
2006	Schering (92.4%) – Bayer	19.3
2007	Pharmacia Corporation – Pfizer	59.8
2009	Pfizer – Wyeth	68.0
2009	Genentech (44.1%) – Roche	42.6

Sources: S. Schmidt and E. Rühl: "Prior strategy processes as a key to understanding mega-mergers: The Novartis case", in *European Management Journal* (Amsterdam, Elsevier), Vol. 20, No. 3, 2002, pp. 223–234, and A.R. Sorkin and D. Wilson: "Pfizer agrees to pay \$68 billion for rival drug maker Wyeth", in *The New York Times* (New York, NY), 26 Jan. 2009.

24. In the chemical industry, M&A activities show more and more cross-border or cross-continent acquisitions. However, in the pharmaceutical industry, many M&A transactions are still done on two continents, namely the United States and Europe. And, there are fewer cross-border acquisitions (figure 1.7).
25. Production of pharmaceuticals in Africa is limited. Domestic production accounts for 10 per cent of demand in Africa, on average, and it is supplied by relatively few companies: 15 in Kenya, 20 in Zimbabwe, nine in Uganda and four each in Cameroon, Côte d'Ivoire and Senegal. In South Africa and Nigeria, subsidiaries of foreign companies are engaged in manufacturing pharmaceuticals for regional markets; however, generally the African pharmaceutical industry is only linked to foreign companies to a limited extent. Thus, building a national pharmaceutical industry is a high priority in most African countries. Even though the size of the pharmaceutical industry is small in Africa, the chemical industry has not been exempt from restructuring. Since the early 1990s, liberalization and privatization have shaped Uganda's pharmaceutical industry. Manufacturing of pharmaceuticals in Uganda only emerged in the private sector in the 1990s. Prior to this, there were three state-owned production units, which were sold to private investors. The pharmaceutical industry grew dramatically during the 1990s, at almost four times the average rate for total industrial production, but it has remained

relatively small. The highest growth occurred with the privatization of the state-owned pharmaceutical companies.¹⁵

Figure 1.7. Number of M&A transactions in the pharmaceutical industry, by region, 1989–2010



Source: Young & Partners, LLC (New York, NY).

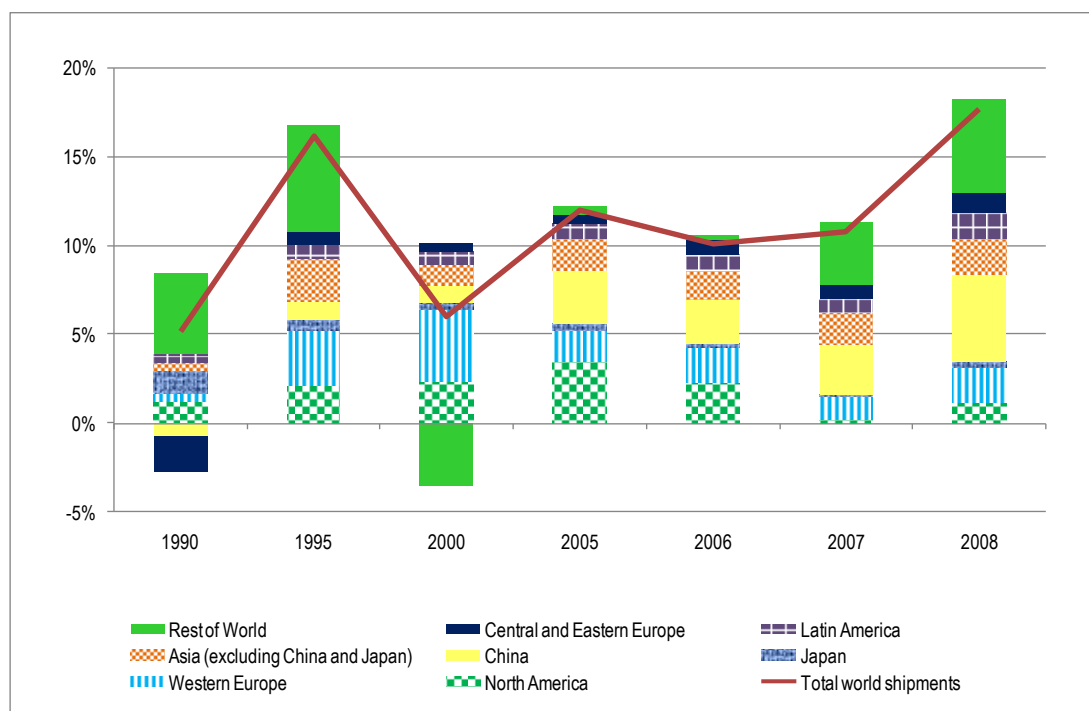
1.3. Emerging chemical and pharmaceutical producing countries

26. Figure 1.8 shows world chemical sales (in terms of volume and price) growth by region. Barclays Capital estimates that in 2000 and 2008, on average, developed economies contributed about one-third of total chemical volume growth, while developing economies such as China, Asia excluding Japan, Latin America and Eastern Europe drove about half of chemical demand growth. Barclays Capital also estimates that over 50 per cent of global chemical volume growth will come from Asia in the next decade.¹⁶ In this section, we discuss China and India – these countries are leading chemical producers in emerging economies.

¹⁵ S.J. Haakonsson: “‘Learning by importing’ in global value chains: Upgrading and South–South strategies in the Ugandan pharmaceutical industry”, in *Development Southern Africa* (Midrand, South Africa, Development Bank of Southern Africa), Vol. 26, No. 3, Sep. 2009, pp. 500 and 504.

¹⁶ S. Vasnetsov: “Sailing through the storm”, in *ICIS Chemical Business* (Sutton, Surrey), 22–28 Mar. 2010, pp. 18–20.

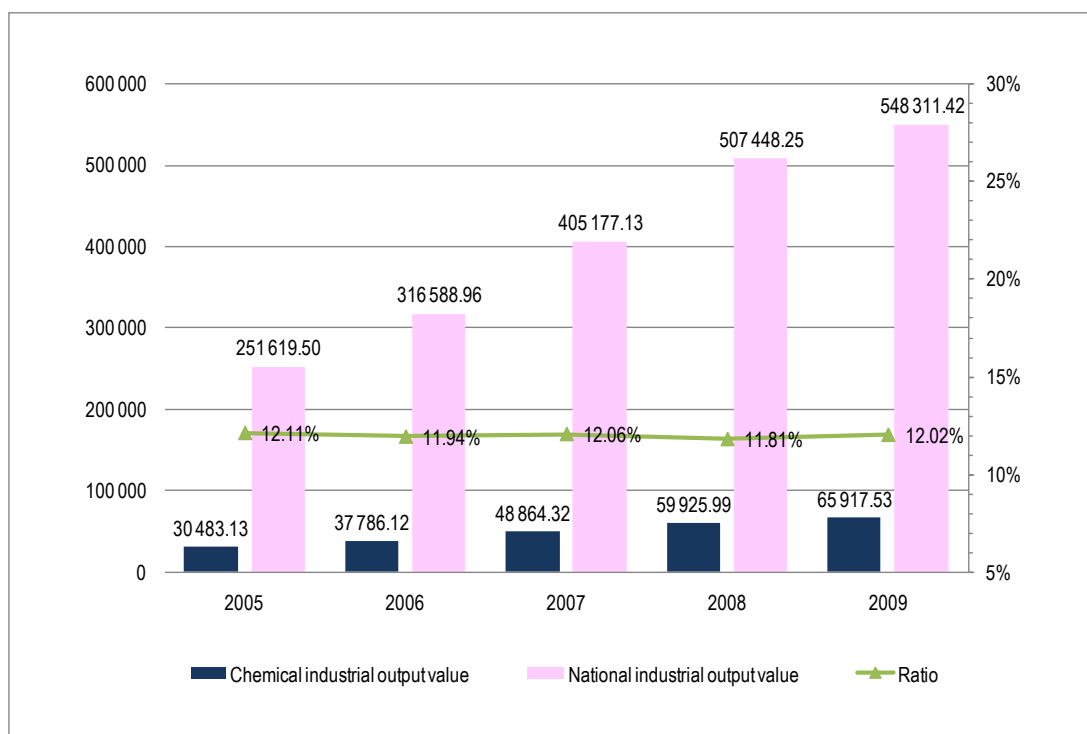
Figure 1.8. World chemical sales (volume and price) growth by region, 1990–2008



Source: Barclays Capital Estimates.

- 27.** In China, the chemical industry holds third position in the national economy, after the textile and machinery industries, and contributes almost 10 per cent of China's current GDP. China's chemical industry has maintained consistently increasing growth over the years. In 2004, it recorded a 30 per cent increase in production of petrochemicals. This achievement made it the fastest growing industry in China. As a pillar industry of the national economy, the chemical industry is highly dependent on resources, it is capital and technology intensive, able to obtain remarkable economic benefits, strongly associated with upstream and downstream activities and, most importantly, plays a significant role in driving economic growth. China's chemical industry accounts for around 12 per cent of national industrial output (figure 1.9). China is the world's second largest producer and consumer of petrochemical products after the United States. The petrochemical industry in China shows a constant increase as a result of the boom in the automobile, textile and building materials industries in China. Figure 1.10 shows output value in 2009 in the chemical, pharmaceutical, plastic and rubber sectors. The total value creation in the chemical industry was 65,917,000 million yuan (about US\$10,199 billion).

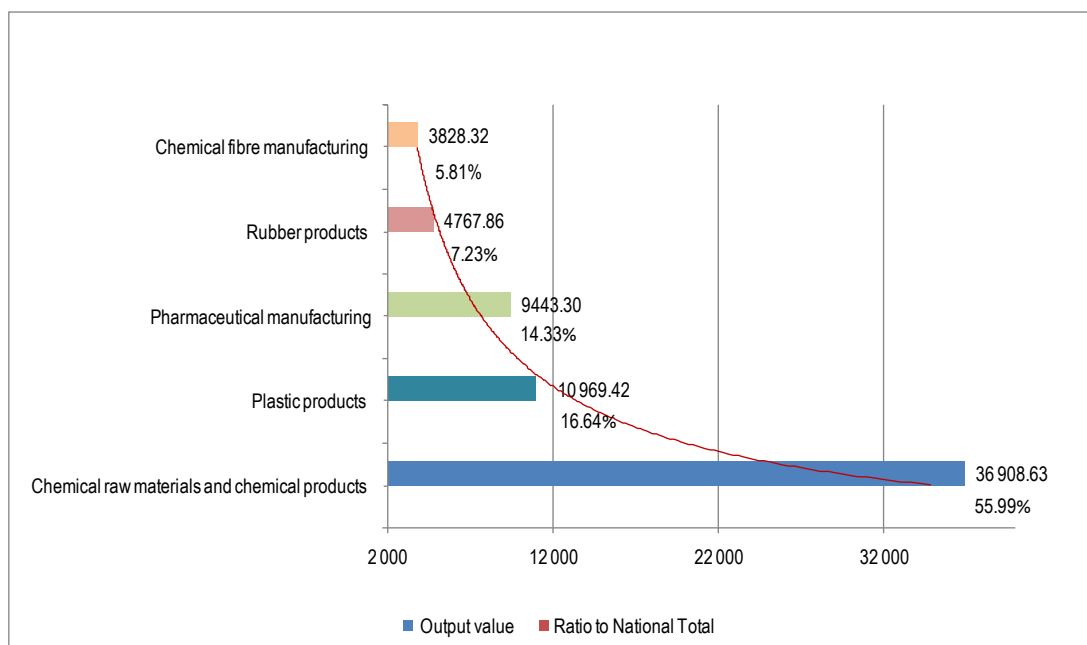
Figure 1.9. Chemical industrial output value and its ratio to GDP in China, 2005–09 (unit: 100 million yuan)



Note: Above data include only the enterprises with annual revenue from principal business over 5 million yuan.

Source: National Bureau of Statistics of China: *China Statistical Yearbook*, 2006–10.

Figure 1.10. Output value of the chemical industry in China, 2009 (unit: 100 million yuan)



Note: Above data include only the enterprises with annual revenue from principal business over 5 million yuan.

Source: National Bureau of Statistics of China: *China Statistical Yearbook*, 2010.

- 28.** China's M&A has three characteristics. First, domestic M&A transactions dominate. They accounted for 52 per cent in 2005 and 71 per cent in 2007. Second, financial restructuring is a primary aim in M&A. The primary process of enterprise restructuring is to change the portfolio, financial and organizational structures of firms. Restructuring in China's

chemical industry is used primarily to attract investment in firms. Third, large state-owned enterprises play an important role, because acquisition takes place on a large scale in the chemical industry. Normally, a transaction costs between US\$20 million and US\$50 million; therefore, state-owned companies can have a financial advantage. State-owned enterprises such as China National Petroleum Corporation, China National Offshore Oil Corporation, China Petroleum & Chemical Corporation, and Sinochem Corporation are major players in M&A in the chemical industry.¹⁷

- 29.** In India, the chemical industry also plays an important part in the country's economy. Its size is estimated at around US\$35 billion, which is about 3 per cent of the country's GDP. In terms of volume, it is 12th largest in the world and third largest in Asia. In India, a wave of M&A is now re-emerging after the slowdown during the global economic crisis. M&A transactions peaked in 2007–08 and 2008–09; and subsequently declined for a short time as a result of the global economic crisis. However, transactions picked up again in 2010. The major M&A transactions in October 2010 alone included Fortis Healthcare's acquisition of Quality HealthCare for US\$195 million, followed by Venkateshwara Hatcheries' takeover of Blackburn Rovers for US\$68.09 million. The top five M&A transactions accounted for 78 per cent of the total value. A sector-wide analysis shows that the pharmaceutical, health-care and biotechnology sectors attracted the most transactions, as five were struck in these areas, amounting to US\$250 million. This was followed by banking and financial services (US\$68.39 million) and the information technology sector (US\$56.22 million).¹⁸
- 30.** In India, the pharmaceutical industry has occupied a number of niches in foreign markets, even as the home market grows rapidly. The most successful are now serious competitors and collaborators with the largest international pharmaceutical firms. Apart from Ranbaxy, acquired by Dai-Ichi Sanyo of Japan in 2007, and another market leader, Matrix Pharmaceuticals, the Indian pharmaceutical industry has shown considerable independence and entrepreneurialism. It is marked by the desire of Indian firms to acquire companies operating in profitable niches around the world rather than to be acquired themselves.
- 31.** A key thrust for most of the medium-sized and large firms is to capture a share of the worldwide market for generic drugs, which is estimated to be worth more than US\$100 billion. The Indian pharmaceutical industry has been self-sustaining; therefore, it covers the entire gamut of products and services, from basic chemicals and basic new drug research, through intermediate products, to formulations and drug delivery solutions. It is particularly vibrant because of its large and still very underpenetrated domestic market. A number of original drug discoveries have emerged. About a dozen of the top companies are now armed with sufficiently lengthy experience of the quality, efficiency, speed-to-market and litigious aptitudes necessary for success in the world of international drug licensing. The industry has also spawned its own contract research outsourcing industry, focused on the research necessary for clinical trials. This is one of the areas of rapid growth. Clinical trials outsourcers have their own global presence, each serving producers with increasing levels of precision, reliability and efficiency. The industry will expand from US\$400 million in turnover during 2007–08 to US\$3 billion in 2015.
- 32.** Despite growth and consolidation, the Indian pharmaceutical industry remains fragmented, with many of its firms undercapitalized. There are thousands of small manufacturers

¹⁷ ILO: *Restructuring and social dialogue in the chemical industry in China*, Sectoral Activities Working Paper (Geneva, forthcoming).

¹⁸ National Safety Council of India (NSCI): *Restructuring and social dialogue in the chemical industry in India*, Sectoral Activities Working Paper (Geneva, ILO, forthcoming).

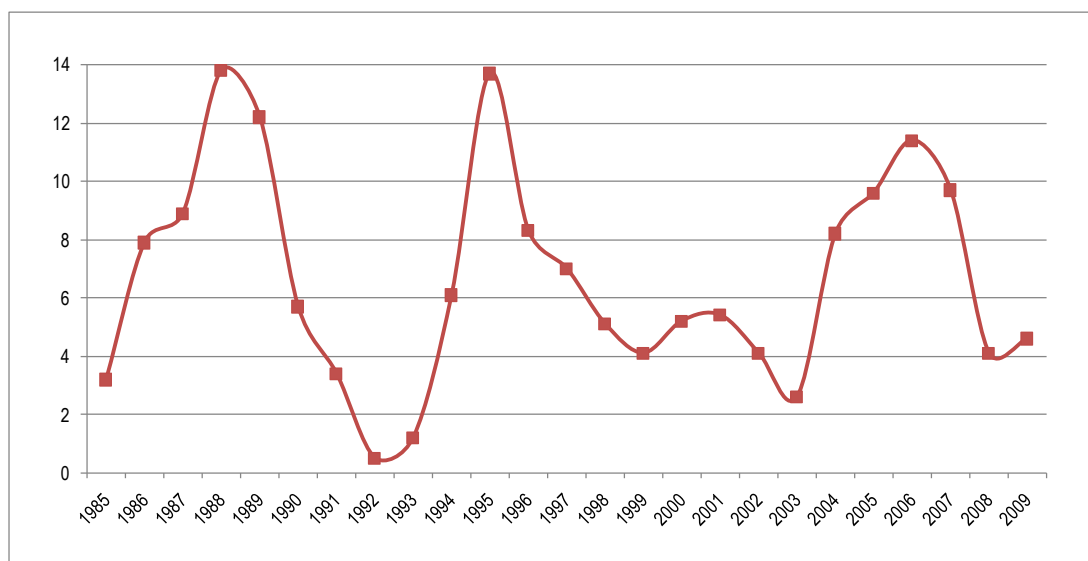
operating in most parts of the country, all of them attracted by the industry's still perennially high margins. Backed by a large and underserved domestic market, and with massive growth potential in generics exports and research outsourcing, the Indian pharmaceutical industry is primed for substantial expansion in the coming years.¹⁹

¹⁹ "India: Pharmaceutical industry is primed for growth", in *Oxford Analytica* (Oxford), 24 Apr. 2009.

2. Factors promoting restructuring in the chemical industry

33. This chapter examines factors influencing restructuring in the chemical industry. M&A play a number of important roles in the chemical industry. Most importantly, M&A help to quickly boost values. A study by AlixPartners, a chemical consulting firm, showed a merger of three European petrochemical firms that resulted in combining market share from 33 per cent to 50 per cent in the monomer and polymer businesses.¹
34. The chemical industry has a strong link with macroeconomic trends. In the chemical industry, there was a unique period of spectacular growth and seemingly endless technology opportunities between 1945 and 1970. After 1970, growth slowed, and two oil shocks and increasingly stringent environmental regulations had a tremendous impact on the industry. From a long-term perspective, the chemical industry normalized, and ups and downs followed each other periodically. Profitability of the chemical industry follows a cyclical trend, which can be seen in figure 2.1. Since the mid-1970s, the profitability of the chemical industry has had three peaks. The first peak-to-peak period lasted for about nine years, between 1980 and 1989. The second peak-to-peak period lasted for about seven years, between 1993 and 2000. The third peak-to-peak period lasted for about eight years, between 2000 and 2009, which was shortly before the global economic crisis hit the chemical industry.

Figure 2.1. Chemical firms' performance, 1985–2009



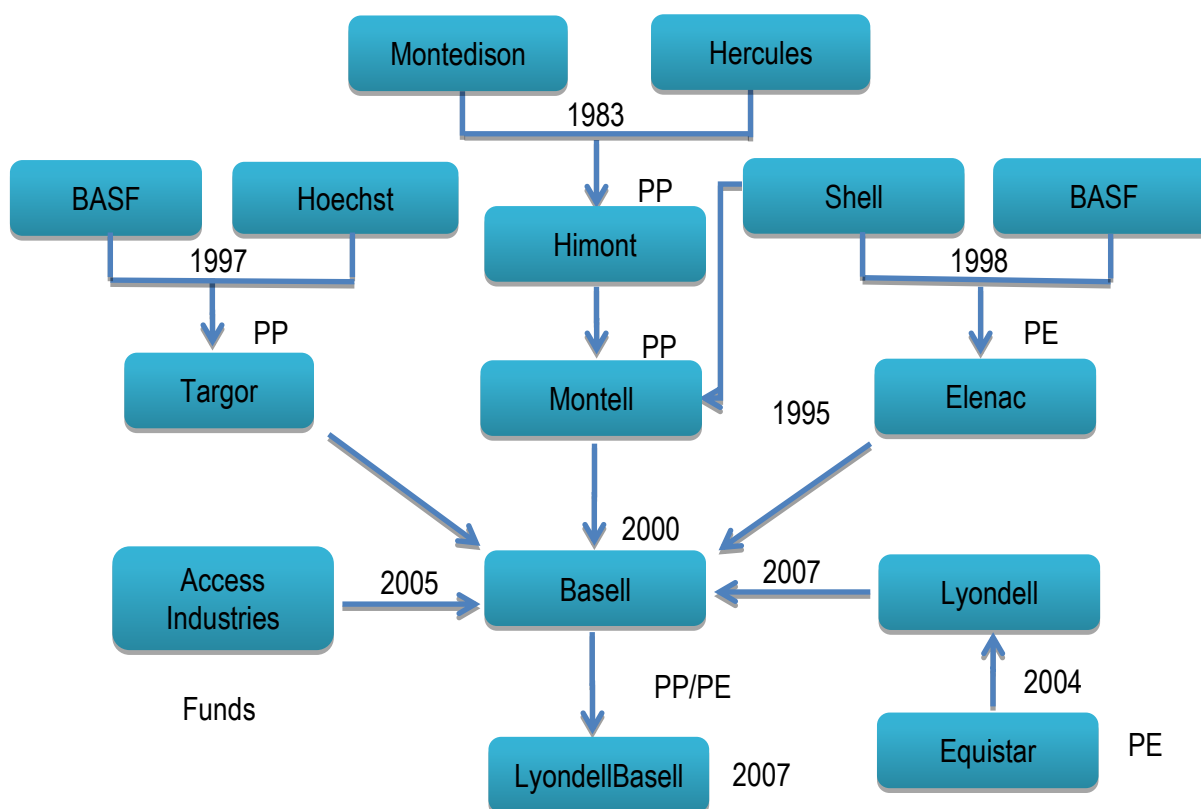
Source: *Petroleum Economist*.

35. Figure 2.2 shows the restructuring that has taken place in the PE and PP sectors in the past two decades. More M&A transactions are foreseen in these sectors. In 2009, the global consumption of polymers reached an estimated 176 million metric tonnes (mt), with PE accounting for 38 per cent of the total. Global demand for PE reached nearly 67 million mt and is forecast to grow more than 5 per cent per year. Polymer demand overall has been strong, particularly in China and the Middle East. SABIC's global polymer business

¹ D. Hutchinson: *Restructuring: A survival guide for European petrochemicals?* (Michigan, MI, AlixPartners LLP, 2005).

increased in volume by 8 per cent in 2009, to 8.7 million mt per year. SABIC added capacity in 2009 at its Sharq and Yansab ventures in Saudi Arabia and at its joint venture with Sinopec in China. Slow growth in demand in the rest of the world has resulted in low operating rates at the plants in North America and Europe. By 2011, excessive capacity is expected to grow nearly 7 million mt in a global market of 14 million mt. This is expected to push operating rates below 70 per cent; operating rates are not expected to recover until after 2015. In Europe, producers need to focus on efficiency, customer relationships and specialized products. Higher-cost capacity needs to be rationalized. In light of this, BASF decided to spin off its styrenic business in January 2011. The spin-off includes its business in styrene monomers, polystyrene (PS), acrylonitrile-butadiene-styrene (ABS), styrene butadiene copolymers (SBC) and other styrene-based copolymers. This is to sustain and improve its global business in an environment of volatile demand, high pressure on margins and intensive competitiveness.²

Figure 2.2. Corporate changes in the polyethylene (PE) and polypropylene (PP) sectors, 1983–2007



Source: Nexant Inc. (San Francisco, CA).

2.1. External environmental changes

36. The continued surge in prices of energy and feedstock is a concern for the petrochemical industry. The prices of crude oil and natural gas are important factors governing profits. Crude oil prices have been volatile in recent years. For example, in June 2008, the price of West Texas Intermediate (WTI) crude oil hit an all-time high of US\$145/bbl. In early 2011, in the middle of the uprisings in countries in the Middle East and Northern Africa,

² L. Bewley et al.: “Plastics: Recovery replenishes outlook”, in *Chemical Week* (London and New York, NY), 18 Oct. 2010, pp. 33–38.

crude oil prices exceeded US\$100/bbl.³ Royal Dutch Shell has warned that in 2011 the world is entering a year of volatile transitions and intensified economic cycles. Price volatility is likely to be a long-term trend. The oil industry is concerned that the recession interrupted the oil and commodity price boom, but it may return. Emerging countries are going through materially intensive development and a tighter market will continue to put pressure on prices and generate volatility.⁴ Some of the other major external environmental changes for the chemical industry are discussed below.

2.1.1. Loss of pricing power

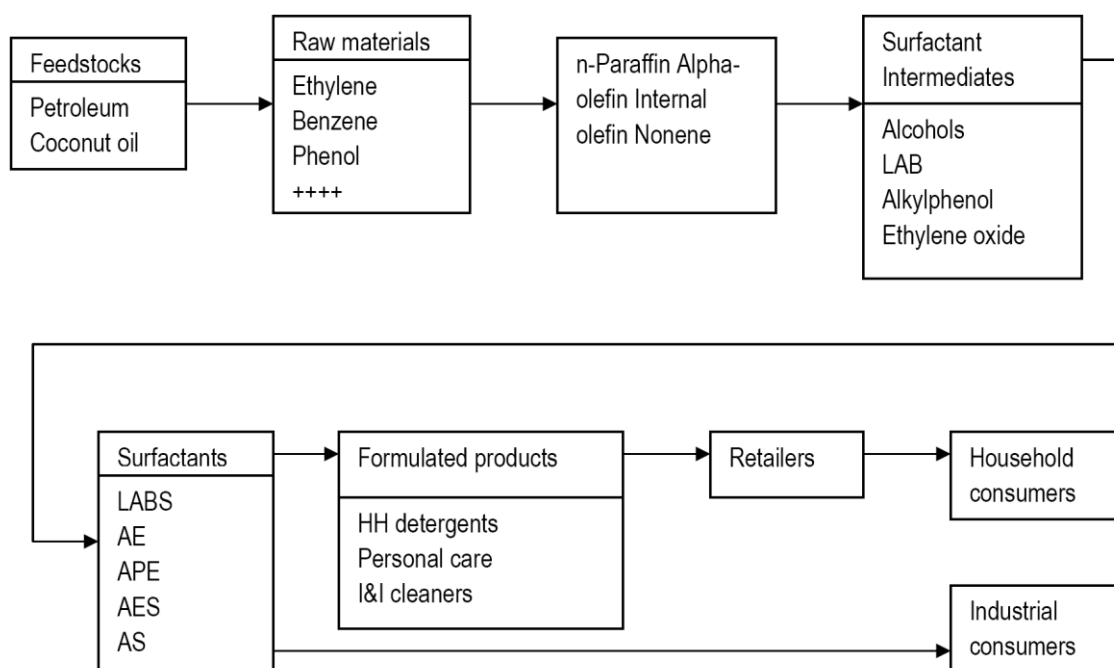
- 37.** Chemical companies are losing their profits to “price leakage”, meaning the difference between the price listed on an invoice and the actual amount a chemical producer retains. Price leakage can occur as a result of negotiated discounts, freight costs, transportation costs and extended payment terms. Large bulk chemical companies are using information technology data-mining tools to examine price information for tactical and strategic purposes. Chemical companies have been overhauling pricing procedures by reducing contract lengths, particularly in the bulk petrochemical markets. For example, since the early 2000s phenol producers have been pushing for a switch from quarterly to monthly contracts, because of the volatility of feedstock prices. Subsequently, benzene and styrene in Europe switched to monthly prices. Chemical firms are trying to get more flexibility in contract terms.⁵
- 38.** Another pressure on pricing power comes from downstream. A notable change in the supply and demand of chemicals is the growing negotiating power of chemical retailers compared to chemical manufacturers. The increasing presence of chemical retailers is an important factor in the restructuring of chemical suppliers. Surfactant suppliers have been hard hit by a shift in power in the product value chain from surfactants to detergents. Figure 2.3 shows the potential for value to be added and costs to be passed on at each step along the value chain. However, in the past decade, retail chains have grown so large and influential that they now dictate terms to the detergent producers and can successfully reject cost increases. Surfactant producers are caught in the middle when raw material price increases cannot be passed on to the mega-retailers and they are increasingly forced to absorb the cost increases that develop as products move along the chain.

³ *Energy Weekly*, Roubini Global Economics (New York, NY), 9 June 2011.

⁴ “Shell warns world energy demand will outpace supply”, *PennEnergy Research*, 16 Feb. 2011.

⁵ “Dow Europe looks for PE hikes of €60/tonne”, in *European Chemical News* (Wageningen), 11–17 July 2005, p. 15.

Figure 2.3. Surfactant value chain structure



Source: Colin A. Houston & Associates.

2.1.2. Chemical-related legislation

39. Targeting the development of affordable health care for the developing world would be excellent public relations for major pharmaceutical companies, and could bring economic and developmental benefits. Pharmaceutical companies have long limited their interaction with developing markets, because of weak patent protection, opaque health-care systems and the low profit such ventures would yield. In India, for example, the 1970 Patent Act removed product patents for pharmaceuticals, food and agrochemicals, allowing patents only for production processes. The statutory term was shortened to seven years for pharmaceutical patents and automatic licensing was put in place. This started an era of reverse engineering, where firms developed new products by changing production processes. From 1970 on, Indian pharmaceutical firms slowly started dominating the domestic market, reducing the market share of the Europe- and US-based pharmaceutical firms. It is said that India's domestic firms have around 70 per cent of the market share compared to 10 per cent in 1970. The Patent Act allowed Indian firms to adopt duplicative imitation and creative imitation as strategies for technical capacity development. The law, in part, promoted the development of the pharmaceutical industry in India. The Act, in turn, boosted the industry.⁶
40. Similarly, the chemical business is concerned about the long-term economic implications of the European Union authorization system for industrial and consumer chemicals, REACH (Registration, Evaluation, Authorisation and Restriction of Chemicals). The stated

⁶ S. Athreye, D. Kale and S.V. Ramani: *Experimentation with strategy and the evolution of dynamic capability in the Indian pharmaceutical sector*, UNU-MERIT Working Paper No. 2008-041 (Maastricht, UNU-MERIT, 2008).

objective of REACH is to ensure a high level of protection of human health and the environment from the risks that can be posed by chemicals through better and earlier identification of the intrinsic properties of chemical substances. It requires manufacturers and importers to identify and manage the risks linked to the substances they manufacture or import, and to have submitted a registration dossier for each substance to that effect to the European Chemicals Agency.

41. However, chemical control overlaps with many other areas of governance, such as cosmetics, pharmaceuticals, wastes, products, pollution, food and radiation; and in fields such as health care and environmental management, risks from multiple stressors are addressed, and need to be linked with chemical risks. The transposition of REACH and the harmonization of its implementation remains a challenge to the chemical industry. Legislative and institutional structures and functions are in flux, and the European Chemical Industry Council (CEFIC) estimates that the average cost of putting a dossier together for substances over 1,000 tonnes per year is around €2–3 million (US\$3–4 million), and there are examples where costs have spiked to more than €10 million, when additional work is needed. This includes the total cost of tests, administration, safety reports and management of the Substance Information Exchange Forum (SIEF).⁷ REACH is a contemporary representation of chemical control that will be revised in 2012. While REACH attracts the most attention, other countries have also been establishing or strengthening their own programmes for the regulation of chemicals, including Canada, China, Japan, Switzerland, Turkey and the United States.

2.1.3. Increasing presence of financial firms

42. The weakening financial position of chemical firms in the early 1990s led to the growing presence of financial investors in M&A activity in the industry. The takeover of chemical businesses by finance groups has become a common phenomenon. The share of private equity firms in overall M&A activity in the chemical industry increased from around 5 per cent in 1997 to about 29 per cent of deals up to September 2004.⁸ This trend continued before the global economic crisis, and private equity firms have made a comeback after the crisis as financing has become more available. In the first quarter of 2010, private equity buyers completed 12 transactions of more than US\$25 million, representing 26 per cent of total deals. In 2009, private equity buyers completed only four deals, comprising 14 per cent of total deals. Private equity can also wind up with a majority stake through the bankruptcy process. In 2010, a consortium of Apollo Management and Access Industries gained control of LyondellBasell through the United States bankruptcy process.⁹ In 2010, Apollo Management announced that it would merge Momentive Performance Materials and Hexion to create one of the world's largest specialty chemicals and materials firms, expanding the business from the United States and Europe to Asia and Latin America.¹⁰ The traditional model is that private equity companies either strip the costs out of their investments or bundle them with similar or complementary businesses before selling them

⁷ “News Focus: New era of REACH begins”, in *ICIS Chemical Business* (Sutton, Surrey), 6–12 Dec. 2010, p. 9.

⁸ E. BurrIDGE: “M&A takes centre stage”, in *ICIS Chemical Business* (Sutton, Surrey), 29 Nov.–5 Dec. 2004, pp. 2–3.

⁹ J. Chang: “Chemical M&A to roar ahead in 2011”, in *ICIS Chemical Business* (Sutton, Surrey), 6–12 Dec. 2010, pp. 26–30.

¹⁰ R. Coons: “Apollo to merge Momentive and Hexion”, in *Chemical Week* (London and New York, NY), 20 Sep. 2010, p. 6.

on. The average life of an investment up to the point of sale is three-and-a-half to five years. However, private equity companies do more than just acquire chemical firms; they get involved in the firms' management in order to boost the profits of their investment.

2.2. Why chemical firms restructure

43. Chemical firms restructure in order to strengthen their competitive advantage. For example, BASF promotes portfolio management to ensure long-term sustainability and competitiveness. Since 2006, BASF's recent acquisitions have included the interests of former Engelhard and Degussa in 2006, Ciba in 2009, and Cognis in 2010. A number of structural measures, such as splitting operating/functional units, legal entity consolidations, reallocation of resources, and divestures owing to anti-trust obligations, have been involved in the integration of these acquisitions. In 2011, the company intends to carve out its styrenics business into a joint venture established with INEOS. When it is involved in M&A transactions, BASF takes into consideration the following factors: optimizing processes, avoiding redundancies, improving cost structures, developing new markets, inventing new ideas and knowledge, concentrating the workforce on/in future businesses.¹¹ UBE Chemical Europe stated that it considered improving its effectiveness in the international market and its standards of quality and service improvement were deemed to be key.¹² Solvay Ibérica stated that in order to implement the group's global strategies based on innovation and geographic growth, the company focused on the promotion of green chemistry and energy and resource savings measures.¹³ The following sections provide some examples of how chemical firms foster competitive advantages.

2.2.1. Maximizing value

44. Schmidt and Rühli (2002) examined how the merger of Sandoz and Ciba (creating Novartis) boosted the value of the two merging companies. As shown in table 2.1, when the merger was announced in 1995, both Sandoz and Ciba were already successful in the pharmaceutical, agricultural, chemical, and nutrition industries.

Table 2.1. Pre-merger profiles of Sandoz and Ciba, 1995

	Sandoz	Ciba
Revenue (Swiss francs)	15 billion	20.5 billion
Profit (Swiss francs)	2 billion	2 billion
R&D budget (Swiss francs)	1.5 billion	2 billion
Workforce	50 000	84 000
Divisional revenue breakdown	Pharma (50%)	Health care (39%)
	Nutrition (26%)	Agriculture (23%)
	Agriculture and seeds (16%)	Industry (38%)
	Construction chemicals (8%)	

Source: S. Schmidt and E. Rühli: "Prior strategy processes as a key to understanding mega-mergers: The Novartis case", in *European Management Journal* (Amsterdam, Elsevier), Vol. 20, No. 3, 2002, pp. 223–234.

¹¹ Information provided to the ILO by BASF SE.

¹² Information provided to the ILO by UBE Chemical Europe SA.

¹³ Information provided to the ILO by Solvay Ibérica SL.

45. The Novartis case was a merger of equals through an exchange of equity, so that no takeover premiums had to be paid. Novartis rapidly became the world's number one in the pharmaceuticals and agriculture sectors. At the same time, important parts of the former businesses of both firms were separated through spin-offs, such as specialty chemicals at Ciba or the construction chemicals of Master Builder Technology (MBT) at Sandoz. At Ciba and Sandoz alike, health care was the most important business unit in terms of both strategy and sales. It was also given top priority within Novartis. Health care includes the pharmaceuticals, consumer health, generics and Ciba Vision divisions. Each of the combined units reached leading market positions, as shown in table 2.2. The Ciba and Sandoz merger is still relevant today.

Table 2.2. Positions of health-care divisions before and after the Ciba–Sandoz merger

	Before		After
	Ciba	Sandoz	Novartis
Pharmaceuticals	Worldwide: No. 10	Worldwide: No.11	Worldwide: No. 2
Consumer health	Europe: >No. 5	Europe: >No.10	Europe: No. 5
	USA: >No. 5	USA: >No.10	USA: No. 7
Generics	Worldwide: Retail: No. 2	Worldwide: Industrial (biochemistry): No. 2	Worldwide: No. 1
Ciba Vision	Worldwide: Eye care: No. 2; Ophthalmic: No. 5	None	Worldwide: Eye care: No. 2; Ophthalmic: No. 5

Source: S. Schmidt and E. Rühl: "Prior strategy processes as a key to understanding mega-mergers: The Novartis case", in *European Management Journal* (Amsterdam, Elsevier), Vol. 20, No. 3, 2002, pp. 223–234.

46. Table 2.3 shows a comparison of Pfizer and Wyeth; the former acquired the latter in 2009. Similar to the Ciba–Sandoz merger, this table shows how Pfizer has created value out of this acquisition. Before the merger, 25 per cent of Pfizer's revenue came from Lipitor, but the drug is due to lose patent protection in November 2011. The company needed a diversified portfolio of new drugs and had been unable to create enough of them on its own. Wyeth was in a similar situation. After the merger, the new company had 17 different prescription drugs on the market in 2009, each of which brought in around US\$1 billion or more.¹⁴

¹⁴ "Pfizer CEO: Wyeth takeover will be different", in *Bloomberg Businessweek* (New York, NY), 26 Jan. 2009.

Table 2.3. Corporate data of two pharmaceutical companies, Pfizer and Wyeth

	Pfizer	Wyeth
Employees	About 83 000	About 47 000
Estimated 2008 revenue	US\$49 billion	US\$23.5 billion
Market value	US\$117 billion	US\$58 billion
Key products and sales (US\$ billion)	Lipitor US\$13.0 (cholesterol)	Effexor US\$4.0 (depression)
	Lyrica US\$2.6 (pain)	Enbrel US\$3.5 (arthritis)
	Novasc US\$2.3 (blood pressure)	Prevnar US\$2.2 (vaccine)
	Viagra US\$2.0 (impotence)	Infant nutritionals US\$1.6
	Xalatan US\$1.8 (glaucoma)	Zosyn US\$1.3 (antibiotic)
	Detrol US\$1.2 (bladder control)	Premarin US\$1.1 (menopause)

Source: "Pfizer agrees to pay US\$68 billion for rival drug maker Wyeth", in *The New York Times* (New York, NY), 26 Jan. 2009.

2.2.2. Synergies

47. Tait et al. (2002) examined how chemical firms choose their business partners in light of technical innovation to strengthen synergies between their products. In a series of takeovers and mergers in the 1970s, multinational agrochemical firms were looking for a new research and development (R&D) trajectory that would enable them to avoid becoming mere producers of commodity chemicals. Biotechnology was deemed to provide the solution to this problem. The agrochemical industry had become relatively concentrated in the late 1990s. Turnover of each of the world's top nine agrochemical firms exceeded US\$2 billion. The top ten companies represented more than 75 per cent of the world market. During the late 1990s, mergers reduced these ten to seven: AgroEvo and Rhône Poulenc merged to form Aventis Crop Science; BASF acquired American Cyanamid; and the agrochemical divisions of Novartis and Zeneca merged to form Syngenta. The subsequent process separating agrochemical from pharmaceutical divisions, begun by Syngenta, has spread to most multinational chemical firms. In the biotechnology arena, public and private finance combined to create a sustainable example of technology push that continues today.
48. Life science increased its significance throughout the 1990s. In practice, there were synergies between agro-biotechnology and pharmaceutical innovation, and life science emerged from those synergies, which became the prime movers of chemical firms. However, synergies between pharmaceutical and agricultural areas of biotechnology became less important. Discovery-level synergy works well where pharmaceutical and agro-biotechnology sectors are interested in sources of chemical novelty, but not in the gene area. Functional genomics can help both sides to invent novel and profitable chemicals, but the major commercial opportunities in the creation of genetically modified crops have no parallel in pharmaceuticals. Chemical firms do not provide the link between the agrochemical and pharmaceutical divisions of companies. Managers of the agricultural arms of biotechnology companies see alignment with other agribusinesses, fighting for agricultural investment. The result of this change in the relationships between agro-biotechnology and pharmaceutical sectors of companies can be seen in the changed pattern of mergers and de-mergers among life science companies. This can be seen in the splitting off from their pharmaceutical divisions of the agrochemical and seeds divisions of Novartis and Zeneca to form Syngenta. In the merger of Zeneca with Astra in 1999, Zeneca had argued for a life sciences model that included agrochemicals, but there was no apparent model for the agrochemicals unit in the merged company. Novartis described 1999 as the year in which it took further steps to focus its business portfolio, moving from

a life science company to a pure health-care company. The demise of pharmaceutical and agrochemical links, and the focusing of attention on the synergy between chemicals and biotechnology, is leading to new patterns of alliance among life science companies.¹⁵

2.2.3. Moving into growing markets

49. The production of chemicals is moving closer to the major consumers. Chemical companies have been implementing restructuring programmes aimed at tipping the companies towards the growth markets in China and other emerging economies. For example, in 1980, nylon accounted for more than 10 per cent of global fibre production, but by 2000, nylon's share had fallen to 7.4 per cent, and by 2009 to only 5.4 per cent. At half the cost of nylon, polyester now dominates the market for synthetic fibres. Demand for fibres has expanded so rapidly over the same period that nylon has lost no ground in absolute terms. From 3 million tonnes in 1980, global production of nylon fibre grew to 3.7 million tonnes in 2009, and it may continue growing at just under 2 per cent per year to 4.4 million tonnes in 2020. Nylon's displacement by polyester is unlikely to proceed much further. However, the geographic distribution of both demand and production has changed significantly, and the trend may continue. Nylon filament yarn production in North America has fallen at an average rate of 5.2 per cent per year since 2005, and 2.5 per cent for Europe. By contrast, China has been taking up the slack. In 2009, the country produced 1.4 million tonnes of nylon filament yarn. Downstream demand growth for nylon is gradually becoming concentrated in China. Nylon demand in China is expected to grow in line with the country's GDP – probably more than 10 per cent per year over the next two or three years.¹⁶

2.2.4. Cost-efficiency in research and development

50. The pharmaceutical industry is characterized by large amounts of R&D. It is also an industry that depends on that research to be productive and generate revenue to finance future research. There is a positive correlation between firms' knowledge diversification and performance. Today, drug development has become an interactive process, where the timing, type and impact of marketing is balanced and managed through certain organizational mechanisms throughout the R&D process. One significant reason for M&A is to reduce the burden of expenditure, in particular R&D. Addressing the 2002 GlaxoWellcome and SmithKline Beecham merger to form GlaxoSmithKline (GSK), Heracleous and Murray (2001) stated that an increasing percentage of sales following the M&A had been spent on R&D, which had risen from around US\$20 billion annually in the early 1990s to around US\$35 billion in 1999. AstraZeneca spent 19.8 per cent of its 1998 sales on R&D; Hoffmann-LaRoche, 19.1 per cent; and Eli Lilly, 18.8 per cent.¹⁷
51. The global economic crisis has led drug firms to improve productivity and offset the impact of generic competition; the major drug companies are making drastic cuts to their R&D operations. For example, in early 2010 GSK announced that it would carve

¹⁵ J. Tait et al.: "The life science industry sector: Evolution of agro-biotechnology in Europe", in *Science and Public Policy* (Guildford, Surrey, Beech Tree Publishing), Vol. 29, No. 4, Aug. 2002, pp. 253–258.

¹⁶ J. Lin: "Nylon shifts toward Asia", in *ICIS Chemical Business* (Sutton, Surrey), 30 Aug.–5 Sep. 2010, pp. 32–33.

¹⁷ L. Heracleous and J. Murray: "The urge to merge in the pharmaceutical industry", in *European Management Journal* (Amsterdam, Elsevier), Vol. 19, No. 4, Aug. 2001, pp. 430–437.

US\$800 million out of its cost structure by 2012; half of that amount will come from R&D. AstraZeneca has slashed over 23,000 positions since 2007. The company has also dropped 20 compounds from development and formed a portfolio investment board that will make decisions about funding individual R&D projects. Pfizer will spend far less on research in coming years. In 2009, the R&D budget was nearly flat at US\$10.6 billion, compared with 2008, and the company will spend US\$9.1 billion to US\$9.6 billion in 2010. By 2012, it is forecast that R&D spending will be US\$8 billion.¹⁸

52. Too great a reduction in investment in R&D may harm the long-term prospects of the chemical industry. The Dutch chemical company DSM has survived for more than a century by transforming itself from a coal-mining company to a fertilizer producer to a diversified bulk chemicals company, and again to a company focused on fine chemicals and high-performance materials. The history of DSM shows how the in-house R&D unit has played a crucial role in developing the company's businesses, both by helping diversification and improving existing processes and products. While this is not the only company unit responsible for the success or failure of innovation processes, it is the source of potentially profitable innovations. In the long term, it is clear that an integrated part of R&D is concern about its productiveness and its relation to business. The main challenge a company faces in organizing R&D has not changed; companies need to keep their research focused on areas that are related to the markets in which they operate and the technologies they use. At the same time, they must find ways to accommodate an organization that formulates visions and generates ideas that might be removed from current interests, that might be long term and that might fail, but at the same time hold promise of profit and success.¹⁹

¹⁸ L. Jarvis: "More R&D cuts from big pharma", in *C&EN* (Washington, DC, American Chemical Society), 4 Feb. 2010.

¹⁹ A. van Rooij: "How R&D helped transform DSM", in *Research-Technology Management* (Arlington, VA, Industrial Research Institute Inc.), Vol. 51, No. 1, Jan.–Feb. 2008, pp. 43–48.

3. The impact of restructuring on employment and conditions of work

53. In the first two chapters we examined the evolution of restructuring in the chemical industry. Our focus now turns to the impact of restructuring on workers in the industry, with ILO constituents illustrating how restructuring has affected their working conditions. For example, the Chemical, Petroleum, Rubber and Plastic Industries Employers' Association of Turkey (KIPLAS) reported that restructuring had led to significant improvements in working conditions and financial incentives at work for employees and chemical companies alike. It had also observed a shift from collective incentives to individual incentives on workers' remuneration. KIPLAS pointed out that Turkish chemical firms and their employees made a priority of flexibility at work and job security for workers.¹ Similarly, Boehringer Ingelheim Austria reported that the company had introduced shift work in plants, as well as additional meals services for the new three-shift systems.² These subjects are examined in this chapter.

3.1. Employment

3.1.1. *Global employment trends in the chemical industry*

54. According to the United Nations Industrial Development Organization (UNIDO) Industrial Statistics database, it is estimated that more than 11.5 million people are currently employed in the global chemical industry, including the pharmaceutical and the rubber and plastic products sectors. As mentioned in the Introduction, the ILO estimates that there are up to 20 million people working in the global chemical and pharmaceutical industries and rubber and tyre industries. Table 3.1 shows global employment in the chemical and pharmaceutical industries for 2000–06. Global chemical employment displays the following trends.

55. First, global chemical employment is showing a gradual and constant decline over time. In 2000, more than 13 million people were employed in the global chemical industry; however, between 2000 and 2006, the global chemical industry lost more than 1.5 million jobs.

56. Second, the share of chemical employment within overall manufacturing industry employment is decreasing over time. In the early 2000s, the share of chemical employment within overall manufacturing industry employment accounted for slightly over 10 per cent; however, in 2006 the share declined to around 7 per cent.

57. Third, chemical employment in the basic chemicals and the other chemicals sectors declined, while employment in the rubber products sector remained relatively unchanged. This indicates, among other things, that rationalization of the workforce has been carried out, particularly in the petrochemicals and the industrial chemicals sectors, although because the rubber production process is more labour-intensive than the petrochemicals sector, employment in the rubber products sector has remained stable (figure 3.1).

¹ Information provided to the ILO by KIPLAS.

² Information provided to the ILO by Boehringer Ingelheim Austria.

58. Fourth, employment in the subsectors within the chemical industry shows those that have been evolving over time. The specific numbers of jobs created and lost can be seen in table 3.1; and figures 3.2(a) and 3.2(b) show a comparison of global chemical employment by subsector in 2000 and 2006. Jobs were created in seven subsectors – basic chemicals, except fertilizers; fertilizers and nitrogen compounds; plastics in primary forms and synthetic rubber; pharmaceuticals and medicinal chemicals; soap, cleaning and cosmetic preparations; other rubber products; and plastic products. Jobs were lost in two sectors – pesticides and other agrochemical products; and other chemical products not elsewhere classified. Employment remained unchanged in the three remaining sectors – paints, varnishes, printing ink and mastics; man-made fibres; and rubber tyres and tubes (figures 3.2(a) and 3.2(b)).

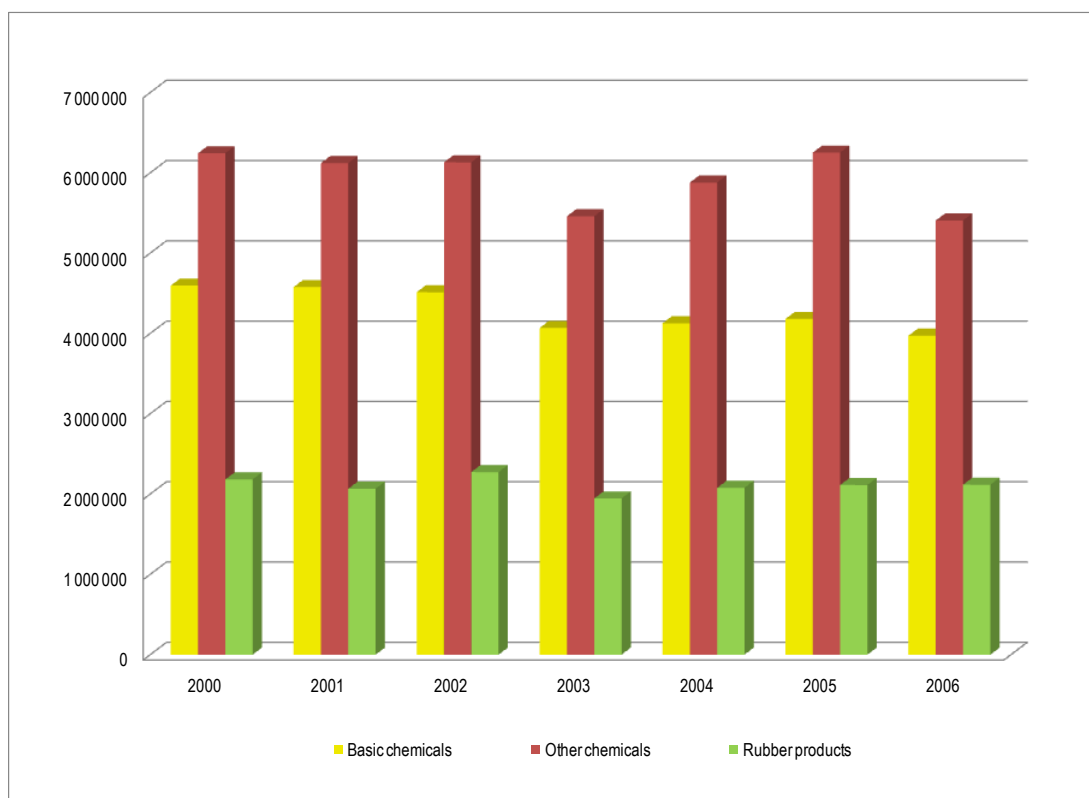
Table 3.1. Global employment in the chemical and pharmaceuticals industry, 2000–06

	2000	2001	2002	2003	2004	2005	2006
Basic chemicals	4 595 717	4 577 608	4 512 740	4 067 439	4 126 065	4 180 410	3 971 679
Basic chemicals, except fertilizers	1 833 897	1 740 174	1 740 174	1 557 738	1 724 716	1 745 871	1 573 796
Fertilizers and nitrogen compounds	1 005 026	968 124	956 129	962 646	914 996	944 588	868 448
Plastics in primary forms; synthetic rubber	664 149	653 576	612 161	552 713	620 562	629 979	575 858
Other chemicals	6 244 390	6 121 304	6 130 417	5 458 780	5 878 578	6 252 026	5 406 303
Pesticides and other agro-chemical products	319 622	263 712	339 401	243 921	235 769	266 355	211 436
Paints, varnishes, printing ink and mastics	722 166	715 268	726 393	619 306	668 082	661 526	568 331
Pharmaceuticals, medicinal chemicals, etc.	2 626 640	2 589 459	2 764 649	2 536 367	2 652 063	2 748 413	2 381 740
Soap, cleaning and cosmetic preparations	863 462	1 604 352	1 634 941	1 190 713	1 318 398	872 427	745 650
Other chemical products n.e.c.	3 259 690	3 245 367	3 288 212	1 211 846	1 342 220	1 425 961	1 295 796
Man-made fibres	653 740	640 531	606 899	499 601	541 570	571 231	516 033
Rubber products	2 182 676	2 066 873	2 273 414	1 945 027	2 077 253	2 112 541	2 116 199
Rubber tyres and tubes	800 911	691 083	769 484	598 365	678 374	695 861	626 204
Other rubber products	978 498	952 017	939 921	787 300	936 498	954 908	892 413
Plastic products	5 787 488	5 684 511	5 738 083	4 717 527	5 540 417	5 777 091	5 223 171
Overall chemical industry	13 022 783	12 765 785	12 916 571	11 471 246	12 081 896	12 544 977	11 494 181
Overall manufacturing industry	119 614 074	116 806 255	117 723 785	153 551 803	169 578 219	169 946 393	159 525 445
Of which the percentage of the chemical industry	10.89%	10.93%	10.97%	7.47%	7.12%	7.38%	7.21%

Note: n.e.c. = not elsewhere classified.

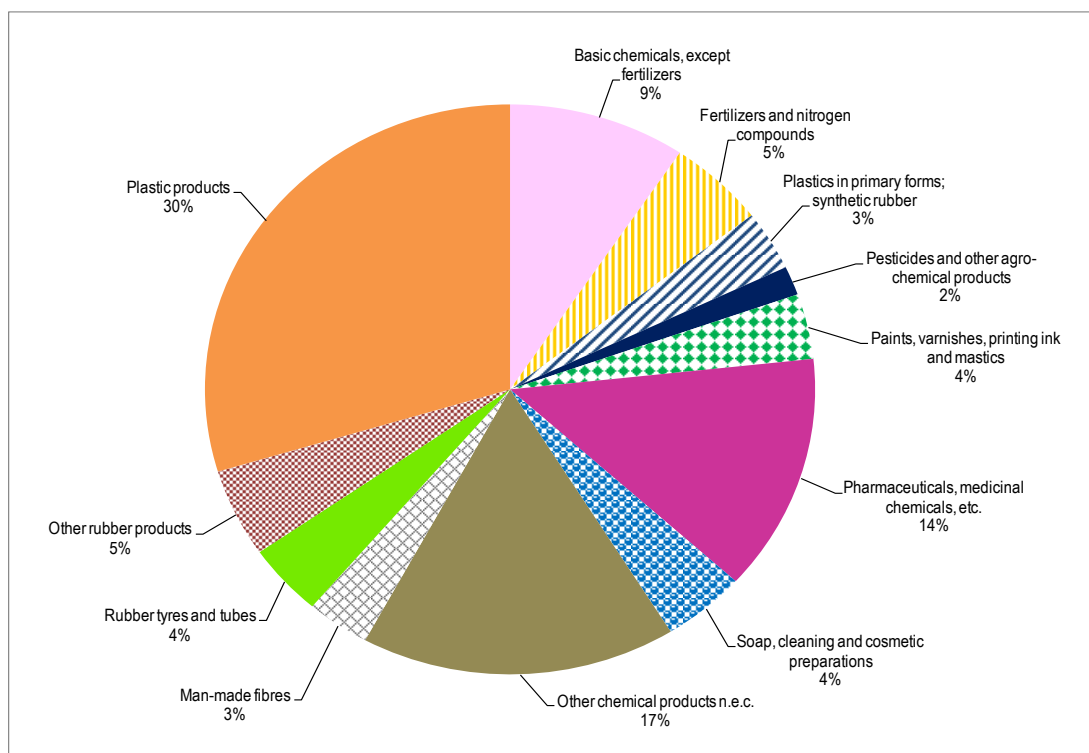
Sources: UNIDO: INDSTAT4, 2010 ISIC Rev.3, and the ILO.

Figure 3.1. Global employment in the chemical industry, 2000–06



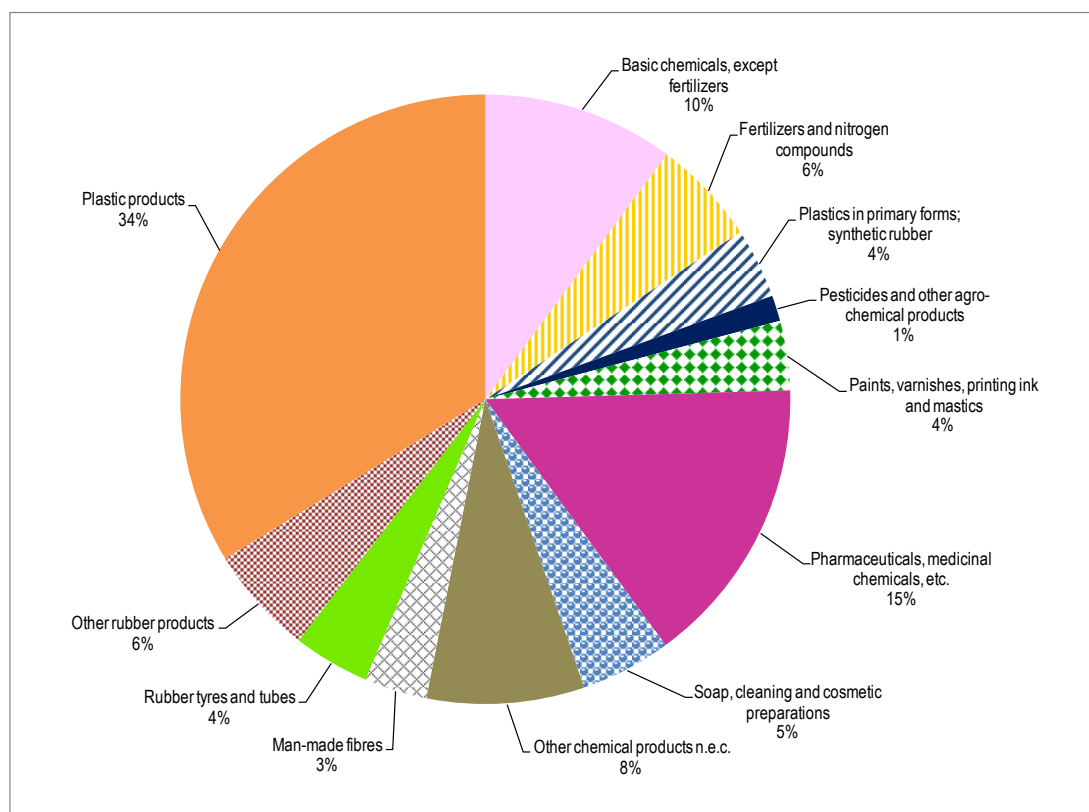
Sources: UNIDO: INDSTAT4, 2010 ISIC Rev.3, and the ILO.

Figure 3.2(a). Global chemical employment by subsector, 2000



Sources: UNIDO: INDSTAT4, 2010 ISIC Rev.3, and the ILO.

Figure 3.2(b). Global chemical employment by subsector, 2006

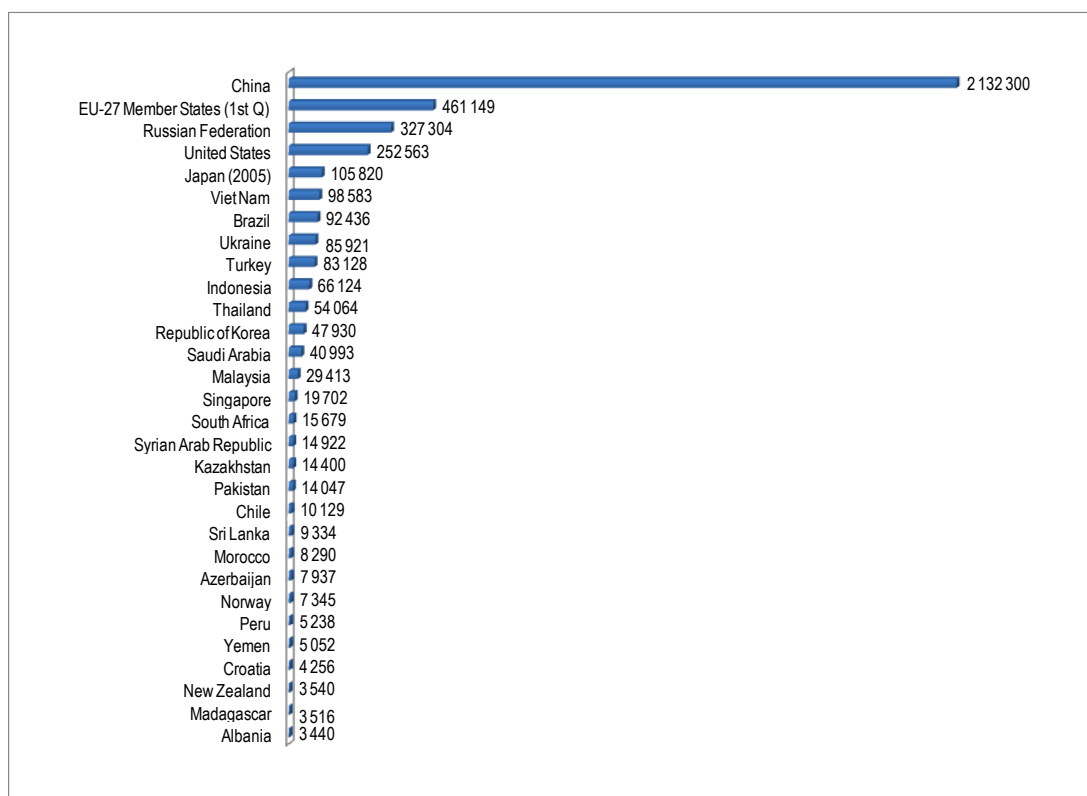


Note: n.e.c. = not elsewhere classified.

Sources: UNIDO: INDSTAT4, 2010 ISIC Rev.3, and the ILO.

- 59.** Figure 3.3 shows the top 30 countries in the world, out of 77 ILO member States, with employment in the basic chemicals sector in 2006. The most current data is available on the UNIDO Industrial Statistics database. The world's largest basic chemical employment is concentrated in China, the 27 Member States of the European Union, the Russian Federation and the United States (in order of volume of employment). In the top 30 countries in the world, over 4 million people were employed in the basic chemicals sector in 2006. Nine of the 30 countries were in Asia; these Asian countries accounted for around 65 per cent of the total top 30 countries' employment. China accounted for over half the total employment.

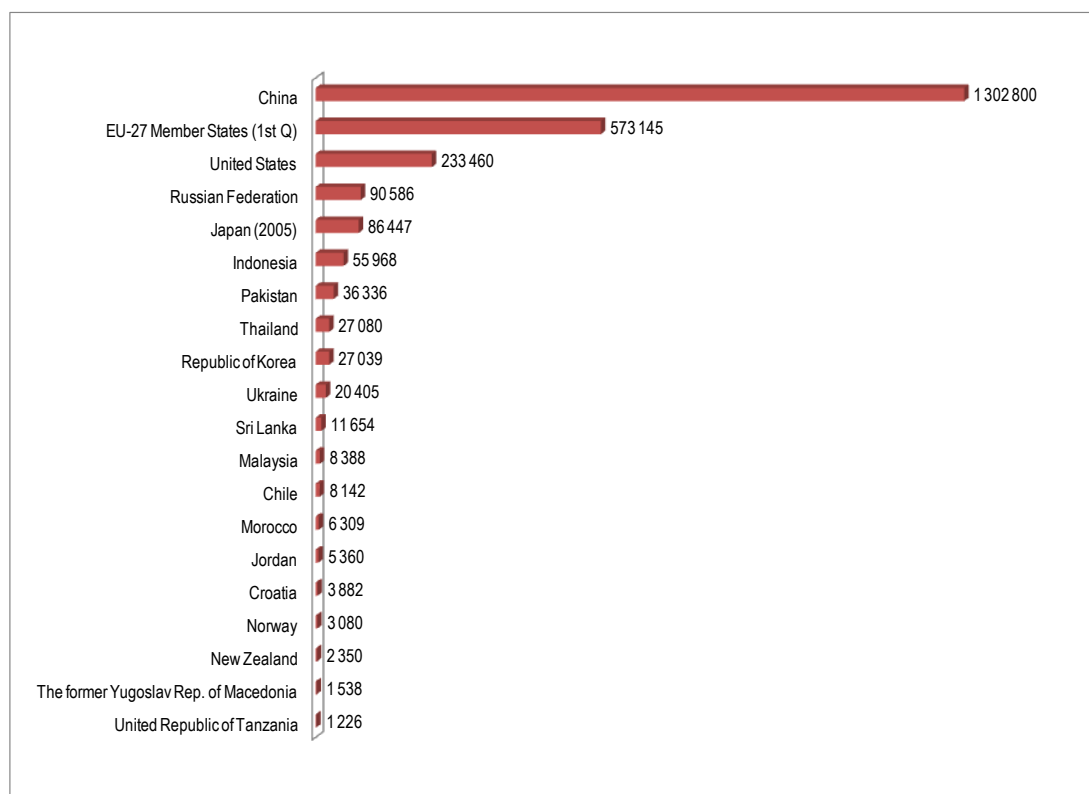
Figure 3.3. Top 30 countries in the world: Employment in basic chemicals, 2006



Source: UNIDO: INDSTAT4, 2010 ISIC Rev.3.

- 60.** Figure 3.4 shows the top 20 countries in the world, out of 52 ILO member States, with employment in the pharmaceutical sector in 2006. The most current data is available on the UNIDO Industrial Statistics database. Similar to employment in the basic chemicals sector, the world's largest pharmaceutical employment is concentrated in China, the 27 Member States of the European Union, the United States and the Russian Federation (in order of volume of employment). Eight of the 20 countries were in Asia; these Asian countries accounted for 62 per cent of the total top 20 countries' employment. China accounted for around half the total employment (employment figures for India were not reported to the Industrial Statistics database in 2006).

Figure 3.4. Top 20 countries in the world: Employment in pharmaceuticals, 2006



Source: UNIDO: INDSTAT4, 2010 ISIC Rev.3.

3.1.2. Employment in Europe

61. It is estimated that the European chemical industry, including the pharmaceutical and the rubber and plastic products sectors, currently employs more than 3 million people. Tables 3.2 and 3.3 show the evolution in national employment in selected European countries in the chemical and chemical products sector and the rubber and plastic products sector, between 2000 and 2010, respectively. There are three major trends in European chemical industry employment.
62. First, between 2000 and 2008 the chemical and chemical products sector in the 27 Member States of the European Union lost nearly 140,000 positions; however, the rubber and plastic products sector lost only 1,600 positions over the same period. It is estimated that the chemical and chemical products sector in these European countries currently employs around 2 million people, and the rubber and plastic products sector employs around 1.3 million people. Job losses in the rubber and plastic products sector were limited because job losses in Western European countries were offset by new jobs created in the Central and Eastern European countries. Total employment loss in ten selected Western European countries, including Denmark, Finland, France, Germany, Ireland, Italy, Netherlands, Norway, Sweden and United Kingdom, was reported to be over 116,000 jobs. However, new jobs created in the Central and Eastern European countries, including the Czech Republic, Estonia, Hungary, Poland, Slovakia and Slovenia, offset most of the employment losses that occurred in the Western European countries. The rubber and plastic products sector in the Central and Eastern European countries created nearly 100,000 positions, of which the largest number of jobs was created in the Czech Republic and Poland. These two countries created nearly 60,000 new jobs.
63. Second, recent job creation in the chemical industry occurred in the Central and Eastern European countries. The global economic crisis has affected employment in Western

European countries, while the chemical industry in the Central and Eastern European countries was less affected or has even been growing during the crisis. In one year, between 2007 and 2008, more than 16,000 jobs were lost in the Western European countries, including Greece, Ireland, Italy, Luxemburg, Norway, Sweden and United Kingdom, of which one-third were lost in the United Kingdom alone. By contrast, over the same period, around 39,000 new jobs were created in some Western European countries and the Central and Eastern European countries, including Austria, Belgium, Czech Republic, Denmark, Estonia, Finland, France, Portugal, Slovenia and Spain, although a large volume of the new jobs created were concentrated in the Central and Eastern European countries.

- 64.** A similar trend can be observed in the rubber and plastic products sector, where more than 12,000 jobs disappeared in 2007 and 2008, over half of which were in the United Kingdom. By contrast, more than 22,000 jobs were created in the Central and Eastern European countries, the majority of which were in Poland.
- 65.** It should be noted that chemical workers in small and medium-sized firms have been most affected by the global economic crisis. In the European Union, the available data suggests that the number of workers employed at small and medium-sized enterprises with fewer than 250 employees in the manufacture of chemicals and chemical products declined from 19,000 in 2006 to 18,607 in 2007, and to 10,500 in 2008. ¹ The actual figures may be even greater.

¹ European Commission: Eurostat.

Table 3.2. Employment in the chemical and chemical product sector in selected European countries, 2000–10

	2000	2001	2002	2003	2004	2005	2006	2007	2008	2009	2010 (first quarter)	Change in employment	
												Between 2007 and 2008	Between 2000 and 2008 or latest year data is available
EU-27 Member States	n.a.	n.a.	n.a.	n.a.	n.a.	1 655 964 ^(b)	1 672 505 ^(b)	1 707 455 ^(b)	1 559 529 ^(b)	1 747 624 ^(b)	1 761 746 ^(b)	n.a.	n.a.
Austria	57 205 ^(a)	57 101 ^(a)	56 525 ^(a)	56 435 ^(a)	55 209 ^(a)	55 022 ^(a)	56 288 ^(a)	58 171 ^(a)	59 614 ^(a)	31 237 ^(b)	32 188 ^(b)	1 443	2 409
Belgium	103 507 ^(a)	105 210 ^(a)	103 104 ^(a)	101 922 ^(a)	101 166 ^(a)	101 166 ^(a)	100 719 ^(a)	100 532 ^(a)	100 681 ^(a)	n.a.	n.a.	149	-2 826
Czech Republic	43 032 ^(a)	43 074 ^(a)	41 536 ^(a)	41 908 ^(a)	41 119 ^(a)	42 660 ^(a)	41 049 ^(a)	39 899 ^(a)	49 966 ^(b)	50 310 ^(b)	51 053 ^(b)	10 067	6 934
Denmark	47 087 ^(a)	49 493 ^(a)	48 577 ^(a)	50 419 ^(a)	49 440 ^(a)	48 901 ^(a)	48 050 ^(a)	50 551 ^(a)	50 976 ^(a)	n.a.	n.a.	425	3 889
Estonia	5 700 ^(a)	6 600 ^(a)	4 000 ^(a)	4 800 ^(a)	7 000 ^(a)	7 000 ^(a)	8 100 ^(a)	8 300 ^(a)	10 200 ^(a)	n.a.	n.a.	1 900	4 500
Finland	40 900 ^(a)	40 600 ^(a)	40 300 ^(a)	38 500 ^(a)	38 100 ^(a)	37 000 ^(a)	36 300 ^(a)	36 500 ^(a)	36 700 ^(a)	17 126 ^(b)	17 073 ^(b)	200	-4 200
France	388 036 ^(a)	386 700 ^(a)	385 046 ^(a)	383 955 ^(a)	380 180 ^(a)	378 517 ^(a)	369 482 ^(a)	363 407 ^(a)	282 246 ^(b)	290 384 ^(b)	310 853 ^(b)	n.a.	-24 629
Germany	943 000 ^(a)	948 000 ^(a)	923 000 ^(a)	912 000 ^(a)	881 000 ^(a)	861 000 ^(a)	856 000 ^(a)	868 000 ^(a)	565 754 ^(b)	567 287 ^(b)	561 978 ^(b)	n.a.	-75 000
Greece	38 416 ^(a)	46 458 ^(a)	47 887 ^(a)	42 204 ^(a)	49 832 ^(a)	46 314 ^(a)	47 012 ^(a)	47 199 ^(a)	45 523 ^(a)	27 101 ^(b)	28 367 ^(b)	-1 676	7 107
Hungary	97 455 ^(a)	89 623 ^(a)	92 845 ^(a)	87 885 ^(a)	87 799 ^(a)	87 990 ^(a)	87 793 ^(a)	86 326 ^(a)	n.a.	n.a.	n.a.	n.a.	-11 129
Ireland	36 703 ^(a)	37 868 ^(a)	38 404 ^(a)	37 768 ^(a)	37 878 ^(a)	37 709 ^(a)	38 322 ^(a)	38 312 ^(a)	36 872 ^(a)	n.a.	n.a.	-1 440	169
Italy	430 900 ^(a)	428 300 ^(a)	433 300 ^(a)	425 100 ^(a)	418 800 ^(a)	418 900 ^(a)	414 100 ^(a)	415 000 ^(a)	408 700 ^(a)	n.a.	n.a.	-6 300	-22 200
Lithuania	n.a.	n.a.	n.a.	n.a.	n.a.	n.a.	n.a.	n.a.	6 830 ^(b)	7 270 ^(b)	n.a.	n.a.	n.a.
Luxembourg	5 600 ^(a)	5 500 ^(a)	5 200 ^(a)	6 000 ^(a)	5 900 ^(a)	5 700 ^(a)	5 400 ^(a)	5 100 ^(a)	5 100 ^(a)	n.a.	n.a.	0	-500
Malta	n.a.	n.a.	n.a.	n.a.	n.a.	n.a.	n.a.	n.a.	610 ^(b)	938 ^(b)	1 212 ^(b)	n.a.	n.a.
Netherlands	114 574 ^(a)	115 228 ^(a)	115 184 ^(a)	112 378 ^(a)	109 940 ^(a)	108 043 ^(a)	107 478 ^(a)	107 165 ^(a)	107 113 ^(a)	64 464 ^(b)	68 912 ^(b)	-52	-7 461
Norway	22 400 ^(a)	21 200 ^(a)	20 500 ^(a)	20 800 ^(a)	20 700 ^(a)	21 500 ^(a)	22 100 ^(a)	22 000 ^(a)	15 124 ^(b)	12 458 ^(b)	11 814 ^(b)	n.a.	-400
Poland	285 166 ^(a)	270 500 ^(a)	244 900 ^(a)	229 100 ^(a)	252 400 ^(a)	257 000 ^(a)	270 900 ^(a)	287 300 ^(a)	312 800 ^(a)	125 419 ^(b)	134 042 ^(b)	25 500	27 634

	2000	2001	2002	2003	2004	2005	2006	2007	2008	2009	2010 (first quarter)	Change in employment	
												Between 2007 and 2008	Between 2000 and 2008 or latest year data is available
Portugal	23 173 ^(a)	22 128 ^(a)	23 058 ^(a)	22 567 ^(a)	21 960 ^(a)	21 780 ^(a)	21 166 ^(a)	n.a.	28 078 ^(b)	26 631 ^(b)	21 374 ^(b)	n.a.	-2 007
Romania	n.a.	n.a.	n.a.	n.a.	n.a.	n.a.	n.a.	n.a.	48 212 ^(b)	46 383 ^(b)	49 020 ^(b)	n.a.	n.a.
Slovakia	42 385 ^(a)	42 054 ^(a)	41 894 ^(a)	41 829 ^(a)	38 774 ^(a)	37 151 ^(a)	38 532 ^(a)	40 788 ^(a)	44 698 ^(a)	14 521 ^(b)	11 439 ^(b)	3 910	2 313
Slovenia	13 843 ^(a)	13 788 ^(a)	13 750 ^(a)	13 965 ^(a)	13 919 ^(a)	13 763 ^(a)	13 630 ^(a)	13 585 ^(a)	13 550 ^(a)	n.a.	n.a.	-35	-293
Spain	270 300 ^(a)	276 500 ^(a)	285 700 ^(a)	292 400 ^(a)	295 400 ^(a)	297 700 ^(a)	294 200 ^(a)	297 700 ^(a)	300 200 ^(a)	171 907 ^(b)	176 490 ^(b)	2 500	29 900
Sweden	41 600 ^(a)	42 500 ^(a)	43 400 ^(a)	41 500 ^(a)	38 700 ^(a)	38 000 ^(a)	37 900 ^(a)	37 600 ^(a)	35 900 ^(a)	27 599 ^(b)	24 744 ^(b)	-1 700	-5 700
Switzerland	n.a.	n.a.	n.a.	n.a.	n.a.	n.a.	n.a.	n.a.	13 465 ^(b)	12 844 ^(b)	n.a.	n.a.	n.a.
United Kingdom	237 075 ^(a)	232 325 ^(a)	232 775 ^(a)	223 600 ^(a)	208 100 ^(a)	197 600 ^(a)	192 025 ^(a)	184 850 ^(a)	179 725 ^(a)	222 649 ^(b)	213 434 ^(b)	-5 125	-57 350

Notes: Data before 2007 (inclusive) refer to the NACE Rev.1 classification. Data after 2009 (inclusive) refer to the NACE Rev.2 classification. n.a. = not available.

Sources: ^(a) OECD: STAN Structural Analysis Database. ^(b) European Commission: Eurostat.

Table 3.3. Employment in the rubber and plastics products sector in selected European countries, 2000–10

	2000	2001	2002	2003	2004	2005	2006	2007	2008	2009	2010 (first quarter)	Change in employment	
												Between 2007 and 2008	Between 2000 and 2008 or the data available latest year
EU-27 Member States	n.a.	n.a.	n.a.	n.a.	n.a.	1 365 710 ^(b)	1 371 390 ^(b)	1 415 647 ^(b)	1 242 243 ^(b)	1 296 383 ^(b)	1 307 055 ^(b)	n.a.	n.a.
Austria	n.a.	24 107 ^(b)	24 200 ^(b)	22 587 ^(b)	19 200 ^(b)	20 187 ^(b)	23 950 ^(b)	26 800 ^(b)	26 349 ^(b)	22 288 ^(b)	26 238 ^(b)	n.a.	n.a.
Belgium	25 245 ^(a)	27 092 ^(a)	26 215 ^(a)	25 367 ^(a)	25 457 ^(a)	25 568 ^(a)	24 827 ^(a)	25 305 ^(a)	25 391 ^(a)	n.a.	n.a.	86	146
Czech Republic	53 543 ^(a)	59 339 ^(a)	60 198 ^(a)	63 058 ^(a)	66 771 ^(a)	71 471 ^(a)	80 481 ^(a)	86 545 ^(a)	86 030 ^(a)	76 316 ^(b)	69 990 ^(b)	-515	32 487
Denmark	21 363 ^(a)	21 472 ^(a)	20 884 ^(a)	21 067 ^(a)	20 353 ^(a)	19 687 ^(a)	19 550 ^(a)	n.a.	n.a.	n.a.	n.a.	n.a.	-1 813
Estonia	2 300 ^(a)	1 900 ^(a)	1 200 ^(a)	2 400 ^(a)	3 600 ^(a)	2 900 ^(a)	4 700 ^(a)	5 400 ^(a)	5 600 ^(a)	3 584 ^(b)	3 798 ^(b)	200	3 300
Finland	18 600 ^(a)	18 000 ^(a)	18 000 ^(a)	16 600 ^(a)	16 500 ^(a)	16 400 ^(a)	15 900 ^(a)	15 800 ^(a)	15 900 ^(a)	14 822 ^(b)	13 033 ^(b)	100	-2 700
France	207 877 ^(a)	214 035 ^(a)	212 900 ^(a)	211 126 ^(a)	212 620 ^(a)	209 066 ^(a)	203 503 ^(a)	199 436 ^(a)	n.a.	200 100 ^(b)	214 221 ^(b)	n.a.	-8 441
Germany	413 000 ^(a)	418 000 ^(a)	406 000 ^(a)	397 000 ^(a)	399 000 ^(a)	390 000 ^(a)	386 000 ^(a)	394 000 ^(a)	n.a.	328 133 ^(b)	332 650 ^(b)	n.a.	-19 000
Greece	12 916 ^(a)	17 629 ^(a)	17 534 ^(a)	16 120 ^(a)	18 219 ^(a)	14 614 ^(a)	15 950 ^(a)	13 859 ^(a)	15 064 ^(a)	13 928 ^(b)	13 087 ^(b)	1 205	2 148
Hungary	40 799 ^(a)	37 660 ^(a)	41 949 ^(a)	36 780 ^(a)	36 981 ^(a)	36 195 ^(a)	40 150 ^(a)	41 168 ^(a)	48 845 ^(b)	43 308 ^(b)	43 595 ^(b)	n.a.	369
Ireland	11 693 ^(a)	10 607 ^(a)	10 383 ^(a)	10 846 ^(a)	11 002 ^(a)	11 170 ^(a)	10 913 ^(a)	10 911 ^(a)	10 501 ^(a)	n.a.	n.a.	-410	-1 192
Italy	200 300 ^(a)	200 200 ^(a)	202 200 ^(a)	200 300 ^(a)	195 600 ^(a)	191 000 ^(a)	184 900 ^(a)	184 800 ^(a)	181 900 ^(a)	n.a.	n.a.	-2 900	-18 400
Lithuania	n.a.	2 971 ^(b)	5 692 ^(b)	5 833 ^(b)	8 425 ^(b)	10 535 ^(b)	10 661 ^(b)	9 834 ^(b)	8 355 ^(b)	8 520 ^(b)	7 313 ^(b)	n.a.	n.a.
Luxembourg	4 100 ^(a)	4 000 ^(a)	3 800 ^(a)	4 500 ^(a)	4 400 ^(a)	4 300 ^(a)	4 300 ^(a)	4 300 ^(a)	4 300 ^(a)	2 547 ^(b)	2 618 ^(b)	0	200
Malta	n.a.	n.a.	1 798 ^(b)	1 857 ^(b)	1 403 ^(b)	1 686 ^(b)	1 568 ^(b)	1 600 ^(b)	1 458 ^(b)	1 477 ^(b)	1 286 ^(b)	n.a.	n.a.
Netherlands	36 070 ^(a)	36 632 ^(a)	35 654 ^(a)	34 430 ^(a)	34 105 ^(a)	33 748 ^(a)	33 472 ^(a)	33 868 ^(a)	34 228 ^(a)	30 277 ^(b)	29 505 ^(b)	360	-1 842
Norway	6 000 ^(a)	5 500 ^(a)	5 000 ^(a)	5 000 ^(a)	4 700 ^(a)	4 700 ^(a)	4 700 ^(a)	5 000 ^(a)	4 966 ^(b)	4 800 ^(b)	n.a.	n.a.	-1 000
Poland	121 073 ^(a)	122 900 ^(a)	106 600 ^(a)	105 800 ^(a)	121 800 ^(a)	129 100 ^(a)	141 400 ^(a)	153 200 ^(a)	167 500 ^(a)	154 110 ^(b)	152 072 ^(b)	14 300	46 427

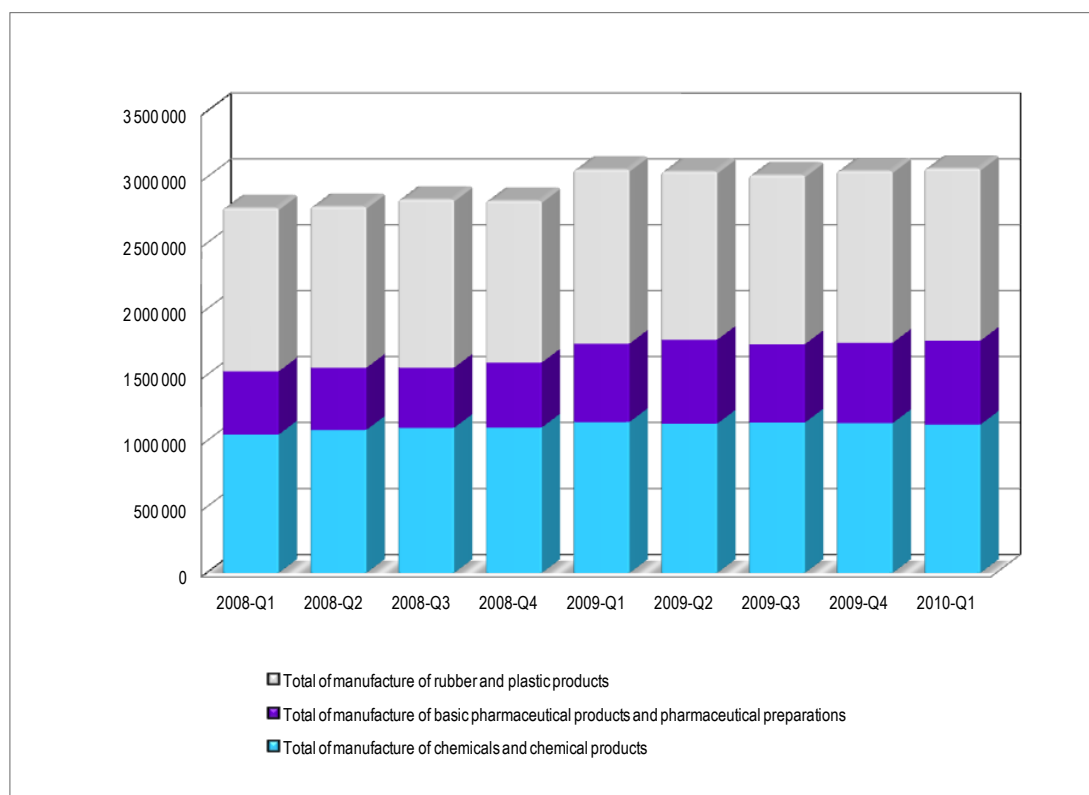
	2000	2001	2002	2003	2004	2005	2006	2007	2008	2009	2010 (first quarter)	Change in employment	
												Between 2007 and 2008	Between 2000 and 2008 or the data available latest year
Portugal	24 548 ^(a)	25 111 ^(a)	26 268 ^(a)	26 332 ^(a)	26 385 ^(a)	26 302 ^(a)	27 109 ^(a)	n.a.	23 825 ^(b)	24 364 ^(b)	24 516 ^(b)	n.a.	2 561
Romania	n.a.	n.a.	n.a.	n.a.	46 040 ^(b)	48 527 ^(b)	51 976 ^(b)	51 420 ^(b)	56 188 ^(b)	53 774 ^(b)	50 195 ^(b)	n.a.	n.a.
Slovakia	16 596 ^(a)	16 302 ^(a)	17 915 ^(a)	20 786 ^(a)	20 744 ^(a)	20 730 ^(a)	22 336 ^(a)	25 078 ^(a)	28 514 ^(a)	31 925 ^(b)	34 911 ^(b)	3 436	11 918
Slovenia	11 648 ^(a)	11 935 ^(a)	12 230 ^(a)	12 571 ^(a)	12 848 ^(a)	13 101 ^(a)	13 368 ^(a)	13 452 ^(a)	13 709 ^(a)	n.a.	n.a.	257	2 061
Spain	115 800 ^(a)	119 500 ^(a)	124 600 ^(a)	126 500 ^(a)	126 800 ^(a)	126 800 ^(a)	124 500 ^(a)	125 700 ^(a)	128 200 ^(a)	100 514 ^(b)	96 706 ^(b)	2 500	12 400
Sweden	26 900 ^(a)	26 800 ^(a)	26 100 ^(a)	26 400 ^(a)	23 900 ^(a)	23 100 ^(a)	23 400 ^(a)	23 300 ^(a)	22 300 ^(a)	21 249 ^(b)	20 249 ^(b)	-1 000	-4 600
Switzerland	n.a.	5 464 ^(b)	4 160 ^(b)	4 570 ^(b)	4 957 ^(b)	5 441 ^(b)	4 829 ^(b)	4 576 ^(b)	5 138 ^(b)	4 400 ^(b)	n.a.	562	n.a.
United Kingdom	235 150 ^(a)	228 050 ^(a)	221 050 ^(a)	213 425 ^(a)	210 275 ^(a)	200 525 ^(a)	195 075 ^(a)	185 800 ^(a)	178 475 ^(a)	164 007 ^(b)	169 889 ^(b)	-7 325	-56 675

Notes: Data before 2007 (inclusive) refer to the NACE Rev.1 classification. Data after 2009 (inclusive) refer to the NACE Rev.2 classification. n.a. = not available.

Sources: ^(a) OECD: STAN Structural Analysis Database. ^(b) European Commission: Eurostat.

66. Third, the European chemical industry seems to be recovering from the global economic crisis. Employment figures, including the chemical and chemical products and the rubber and plastic products sectors in the 27 Member States of the European Union, have increased by around 100,000 positions, from 3,021,674 in 2005, to 3,123,102 in 2007. However, the global economic crisis has had an impact on recent employment, with a decrease to 2,801,772 in 2008. Employment increased to 3,044,007 in 2009, reaching nearly 3.1 million in the first quarter of 2010.
67. Figure 3.5 shows the evolution in employment in the chemical industry in the 27 Member States of the European Union between 2008 and the first quarter of 2010. The European chemical industry added around 37,000 new jobs every quarter. Employment in the 27 Member States of the European Union was reported at around 2.77 million in the first quarter of 2008. It increased to slightly over 3 million in the first quarter of 2010. An increase in employment occurred across all sectors. The chemical and chemical products sector increased by around 75,000 – an increase from 1.05 million in the first quarter of 2008 to 1.12 million in the first quarter of 2010. The basic pharmaceutical products and pharmaceutical preparations sector increased by around 158,000 – an increase from 479,000 in the first quarter of 2008 to 637,000 in the first quarter of 2010. The rubber and plastic products sector increased by around 67,000 – an increase from 1.24 million in the first quarter of 2008 to 1.31 million in the first quarter of 2010.

Figure 3.5. Employment in the chemical industry in 27 EU Member States, 2008–10



Source: European Commission.

3.1.3. Employment in Latin America

68. Table 3.4 shows employment in the chemicals and chemical products sector in nine selected countries in Latin America for 2000–08. Employment in the industry grew continuously in all the countries during the period. Between 2000 and 2006, the chemical

industry in those countries created nearly 350,000 new jobs. The chemical industry in Latin America is experiencing its longest period of sustained growth in more than a generation. Many chemical firms in the region have benefited from rich crude oil and feedstock. Brazil, for example, is self-sufficient in crude oil and has a highly integrated upstream production business in oil and gas and petrochemicals, which improves availability of petrochemical feedstock and thereby increases competitive advantage.

Table 3.4. Employment in the manufacturing of chemicals and chemical products sector in selected countries in Latin America, 2000–08

	2000	2001	2002	2003	2004	2005	2006	2007	2008
Argentina	87 340	92 523	83 000	98 206	95 245	87 985	96 994	n.a.	n.a.
Brazil	n.a.	n.a.	506 000	619 000	685 000	619 000	678 000	788 350	n.a.
Colombia	38 887	41 611	39 909	39 726	40 736	55 947	n.a.	n.a.	n.a.
Costa Rica	9 500	8 332	n.a.	10 846	11 081	15 660	11 999	12 100	12 740
Dominican Republic	n.a.	n.a.	n.a.	n.a.	21 935	19 222	22 614	23 612	n.a.
Ecuador	n.a.	n.a.	10 039	14 986	18 424	23 183	15 255	n.a.	n.a.
El Salvador	12 525	14 028	16 068	12 980	15 642	14 726	11 701	13 065	n.a.
Mexico	250 959	253 035	242 557	215 096	252 420	248 720	226 753	239 052	267 493
Peru	17 390	31 131	31 034	15 070	28 011	18 190	36 465	34 100	28 248

n.a. = not available.

Source: ILO: Laborsta.

3.1.4. Employment in the United States

69. The US chemical industry may be the industry most severely affected by the global economic crisis among the countries for which reliable data is available. More than 66,000 jobs were lost in the US chemical industry between 2008 and 2009, or around 5.1 per cent of the total workforce in the US chemical industry. The plastic products manufacturing sector was the most severely affected, with a loss of 74,000 jobs, or 19 per cent of overall employment in the sector. The rubber products sector lost the second largest number of jobs, around 24,000, or a decline of nearly 30 per cent in overall employment in the sector. The resins, synthetic rubber and fibres, and filaments sector lost around 21,000 jobs, or around 30 per cent of overall employment in the sector. These sectors are major suppliers to the automobile manufacturing industry and the construction industry, which were directly affected by the global economic crisis. Prior to the crisis, these sectors had been experiencing steady growth in employment. In fact, the resins, synthetic rubber and fibres, and filaments sector was one of the fastest growing sectors in the chemical industry in recent years, followed by the pharmaceuticals and medicines sector, accounting for nearly 40 per cent of overall employment in the US chemical industry (table 3.5 and figure 3.6).

70. Employment in the US chemical industry improved in 2010. First, small firms started to increase numbers of staff. This was possibly because small firms may have had additional motivation to recruit given that the Small Business Jobs Act of 2010 will provide them with tax breaks, better access to credit, and other incentives. Second, the number of green-chemistry-based jobs also began to increase. Stimulus funding is supporting the development of many green-chemistry-based businesses, creating new jobs in the process. For example, Dow Chemical received US\$20 million in Department of Energy funding to develop its Powerhouse Solar Shingle. In total, the company aimed to create more than 1,200 new jobs by 2014 to support production of green roofing material. Third, the number

of production workers was cut severely as a result of the global economic crisis, and some firms have started to hire workers to fill those posts. In 2010, Air Products hired around 40 per cent more workers than in 2009. Their new hires included plant operators, technicians, plant supervisors, and chemical engineers with plant-process-efficiency expertise.¹

Table 3.5. Employment in the chemicals industry in the United States, 2003–09

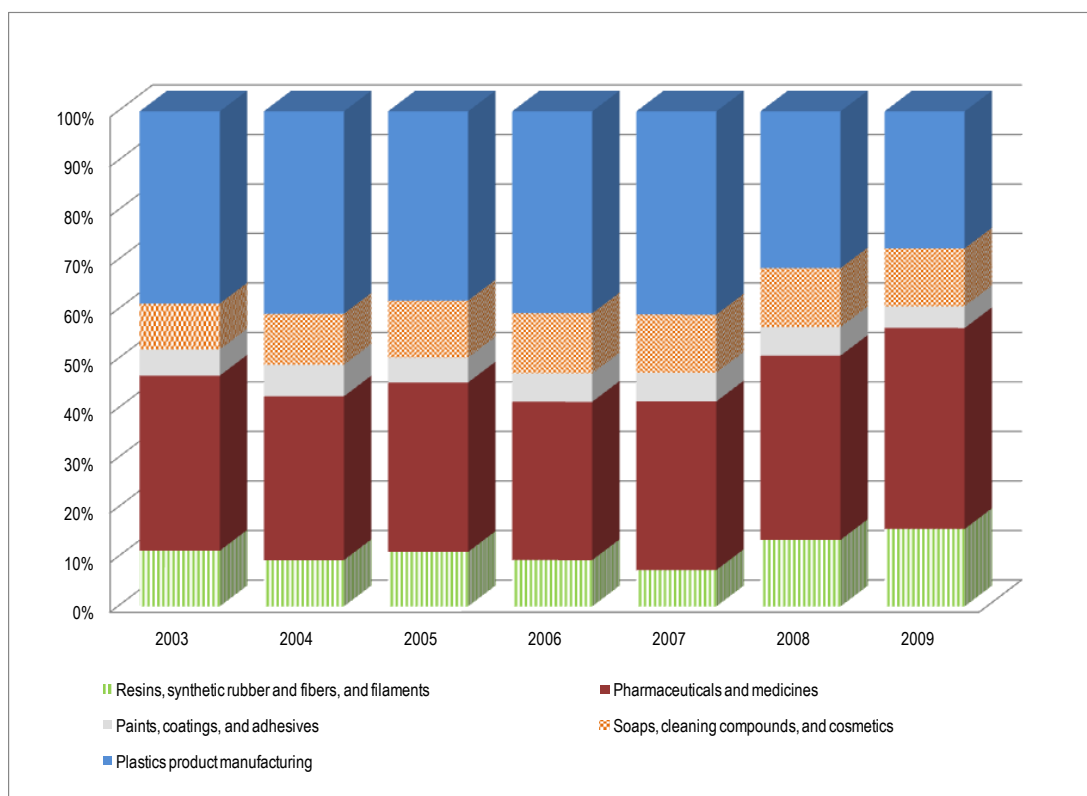
	2003	2004	2005	2006	2007	2008	2009
Chemicals	1 302 000	1 216 000	1 208 000	1 237 000	1 229 000	1 293 000	1 227 000
Resins, synthetic rubber and fibers, and filaments	153 000	121 000	135 000	122 000	101 000	165 000	178 000
Agriculture chemical manufacturing	n.a.	n.a.	n.a.	n.a.	35 000	28 000	30 000
Pharmaceuticals and medicines	481 000	428 000	420 000	417 000	468 000	457 000	462 000
Paints, coatings and adhesives	72 000	83 000	62 000	75 000	80 000	71 000	50 000
Soaps, cleaning compounds and cosmetics	126 000	133 000	141 000	158 000	161 000	146 000	133 000
Industrial and miscellaneous chemicals	n.a.	n.a.	n.a.	n.a.	383 000	425 000	375 000
Plastics and rubber products	705 000	714 000	652 000	715 000	725 000	550 000	448 000
Plastics product manufacturing	528 000	529 000	469 000	532 000	564 000	389 000	315 000
Tire manufacturing	85 000	86 000	84 000	102 000	84 000	70 000	65 000
Rubber products, except tire manufacturing	92 000	100 000	99 000	81 000	77 000	92 000	68 000

n.a. = not available.

Source: United States Bureau of Labor Statistics: Household data: Annual averages.

¹ S. Ainsworth: “Cautiously optimistic”, in *C&EN* (Washington, DC, American Chemical Society), 1 Nov. 2010, pp. 38–42.

Figure 3.6. Employment in the chemical industry in the United States, by sector, 2003–09



Source: United States Bureau of Labor Statistics: Household data: Annual average.

71. Table 3.6 shows employment estimates by occupation in the basic chemical manufacturing sector in the United States for 2003, 2006 and 2009. Although employment declined between 2003 and 2009 for all categories, except for health-care practitioner and technical occupations, and protective services, which increased slightly, the number of employees in business and financial operations occupations and in production occupations remained relatively unchanged, while the numbers for installation, maintenance and repair occupations and for transportation and material-moving occupations declined, with a more marked decline in computer and mathematical sciences occupations, architecture and engineering occupations, and office and administrative support occupations. In terms of the percentage of total employment, in the short term between 2006 and 2009, management occupations, business and financial operations occupations, life, physical and social sciences occupations, health-care practitioner and technical occupations, and protective service occupations all increased. The remaining occupations declined slightly. The most severely affected occupations included production occupations, transportation and material-moving occupations, and business and financial operations occupations. In the long term, between 2003 and 2009, business and financial operations occupations, life, physical and social science occupations, health-care practitioner and technical occupations, protective service occupations, and production occupations gained proportionately, while management occupations, construction and extraction occupations, and installation, maintenance and repair occupations lost.

Table 3.6. Employment estimates by occupation in the basic chemical manufacturing sector in the United States, 2003, 2006 and 2009

Occupation	2003		2006		2009	
	Persons	% of total	Persons	% of total	Persons	% of total
Management	11 860	7.17	9 090	6.21	9 880	6.61
Business and financial operations	5 810	3.51	4 170	2.85	5 560	3.72
Computer and mathematical science	2 290	1.38	2 040	1.39	1 800	1.20
Architecture and engineering	12 580	7.61	8 530	5.82	11 200	7.49
Life, physical, and social science	13 050	7.89	11 600	7.92	12 120	8.11
Legal	210	0.13	100	0.07	50	0.03
Arts, design, entertainment, sports and media	160	0.10	150	0.10	120	0.08
Health-care practitioner and technical	620	0.37	370	0.25	770	0.52
Protective service	440	0.27	350	0.24	550	0.37
Building and grounds cleaning and maintenance	640	0.39	630	0.43	500	0.33
Sales and related	3 500	2.12	3 070	2.10	3 130	2.09
Office and administrative support	15 920	9.63	12 910	8.81	13 120	8.78
Construction and extraction	3 330	2.01	2 920	1.99	1 910	1.28
Installation, maintenance and repair	18 180	10.99	16 050	10.96	15 260	10.21
Production	63 400	38.33	62 670	42.78	62 720	41.96
Transportation and material moving	13 370	8.08	11 850	8.09	10 730	7.18

Note: May of each year.

Source: United States Bureau of Labor Statistics: Occupational Employment Statistics, 2004–10.

3.1.5. Employment in China

72. Employment in the chemical industry in China has shown impressive growth in recent years (table 3.7). Between 2005 and 2008, the Chinese chemical industry created 333,609 new positions. As a result, the total number of positions in the Chinese chemical industry reached 4,553,904 people at the end of 2008. The global economic crisis has had a relatively limited impact on chemical employment in China, with the Chinese chemical industry experiencing only around 5,000 job losses in 2008.

73. What is unique to the Chinese chemical industry is that nearly half the jobs, or around 2.2 million positions, are concentrated in the manufacturing of chemical raw materials and chemical products sector. This is a result of the rapid development of the petrochemical industry in the country in recent years. This sector alone created 92,438 jobs between 2005 and 2008. The second largest number of jobs created was in the pharmaceutical sector (manufacture of medicines), where nearly 1 million people were employed at the end of 2008. Between 2005 and 2008, the pharmaceutical sector created 67,076 jobs. The growth of the consumer durable goods sector in China led to job creation in the plastic and rubber sectors: between 2005 and 2008, 1 million new jobs were created in the manufacturing of plastics sector, and 70,299 in the manufacturing of rubber sector.

74. The Chinese chemical industry is also familiar with restructuring; in recent years, there has been a flow of jobs moving from state-owned enterprises to new types of ownership, such as private enterprises and joint ventures with foreign interests. These new types of enterprises in the chemical industry have generated more jobs than the state-owned

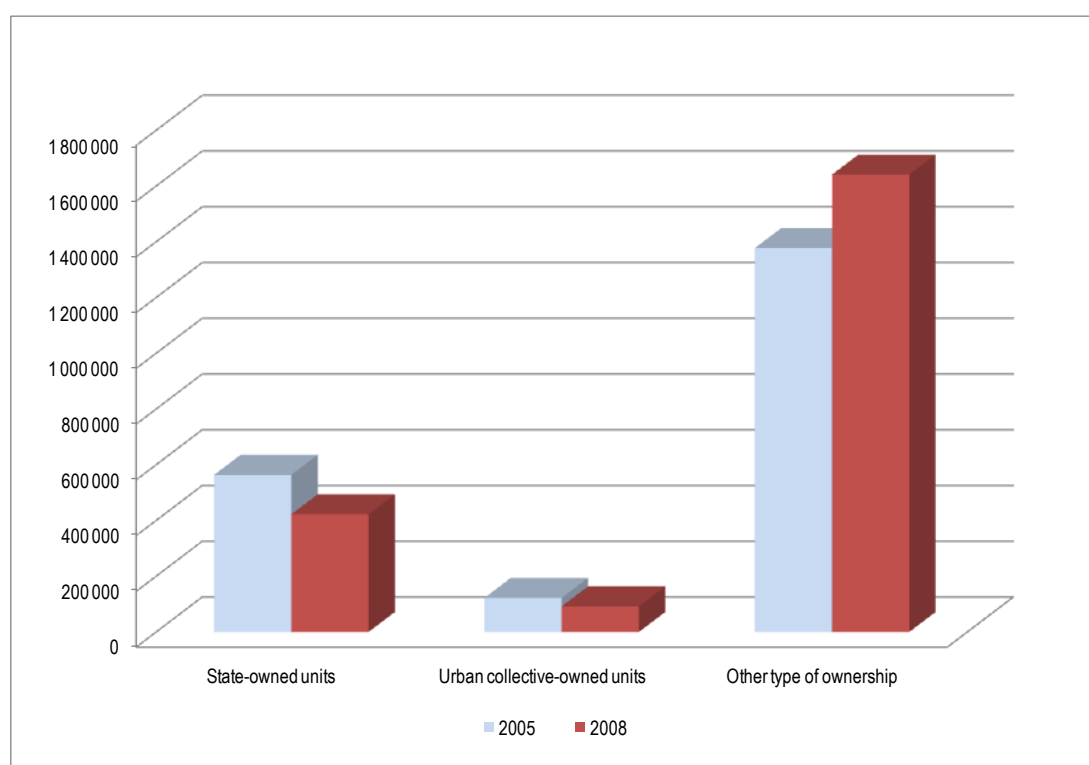
enterprises, and this trend appears to be continuing. For example, compared to employment figures by type of enterprise ownership in 2005 and 2008, state-owned enterprises and urban collective-owned enterprises together lost 171,451 jobs, while other types of enterprises gained 263,889 jobs, considerably exceeding the number of jobs lost in state-owned and urban collective-owned enterprises (figure 3.7).

Table 3.7. Employment in the chemical industry in China, 2005–08

	2005	2006	2007	2008
Manufacture of chemical raw material and chemical products	2 062 680	2 130 000	2 159 162	2 155 118
Manufacture of medicines	892 789	927 000	925 652	959 865
Manufacture of chemical fibre	202 381	213 000	222 331	211 078
Manufacture of rubber	368 109	401 000	431 887	438 408
Manufacture of plastic	694 336	777 000	819 606	789 435
Total	4 220 295	4 448 000	4 558 638	4 553 904

Source: National Bureau of Statistics of China: *China Statistical Yearbook*, 2005, 2006, 2007 and 2008.

Figure 3.7. Employment in the chemical industry in China, by type of corporate ownership, 2005 and 2008



Source: National Bureau of Statistics of China: *China Statistical Yearbook*, 2005 and 2008.

3.1.6. Employment in India

75. Before the global economic crisis, many chemical-producing countries experienced challenging years, because the chemical industry in these countries suffered from lower profit margins between the late 1990s and the early 2000s. The chemical industry in these countries was compelled to take serious rationalization measures, including retrenchment of the workforce; reduction of production volumes; and even more serious cost-cutting

measures that included selling part or all of business interests. India is one such example. Between 2002 and 2003, the chemical industry in India cut 176,059 jobs; however, when profit margins improved, the chemical industry turned swiftly to recruit more people to meet rapidly increasing market demands. Since 2003, India's chemical industry has been recruiting more and more people into the sector. Between 2005 and 2006, India's chemical industry hired an additional 302,438 people, and between 2007 and 2008 it hired a further 107,654, even during the global economic crisis. As a result, it was estimated that India's chemical industry employed nearly 2.2 million people by 2008, including those in the manufacturing of rubber and plastic products sector (table 3.8). The actual employment figure may even be larger, because a considerable number of workers are employed in the informal sector in India. There are two types of firms operating: organized-sector firms and informal-sector firms. In India, it is estimated that there may be nearly 24 million informal workers in the pharmaceutical industry.²

Table 3.8. Employment in the chemical industry in India, 2001–09

		2001–02	2002–03	2004–05	2005–06	2006–07	2007–08	2008–09
Manufacture of chemicals and chemical products	Workers ^(a)	509 812	497 586	536 050	560 863	593 264	611 022	420 646
	Employees ^(b)	761 244	n.a.	n.a.	n.a.	n.a.	n.a.	n.a.
	Total persons engaged ^(c)	755 113	740 441	784 907	825 435	877 082	892 944	581 053
	(a) + (c)	1 264 925	1 238 027	1 320 957	1 386 298	1 470 346	1 503 966	1 001 699
Manufacture of rubber and plastic products	Workers ^(a)	201 185	210 534	228 747	243 160	343 001	275 871	331 837
	Employees ^(b)	269 292	n.a.	n.a.	n.a.	n.a.	n.a.	n.a.
	Total persons engaged ^(c)	261 691	103 181	304 476	317 414	148 487	360 285	430 981
	(a) + (c)	462 876	313 715	533 223	560 574	491 488	636 156	762 818
Manufacture of pharmaceuticals, medicinal chemical and botanical products	Workers ^(a)	n.a.	n.a.	n.a.	n.a.	n.a.	n.a.	237 966
	Total persons engaged ^(c)	n.a.	n.a.	n.a.	n.a.	n.a.	n.a.	379 083
	(a) + (c)	n.a.	n.a.	n.a.	n.a.	n.a.	n.a.	617 049
Total		1 727 801	1 551 742	1 854 180	1 946 872	1 961 834	2 140 122	2 381 566

^(a) Workers are defined to include all persons employed directly or through any agency, whether for wages or not, and engaged in any manufacturing process or in cleaning any part of the machinery or premises used in the manufacturing process, or in any other kind of work incidental to, or connected with, the manufacturing process or the subject of the manufacturing process. Labour engaged in the repair and maintenance or the production of fixed assets for the factory's own use, or employed for generating electricity, or producing coal, gas, etc. are included.

^(b) Employees include all workers defined above and persons receiving wages and holding clerical or supervisory or managerial positions engaged in administrative offices, store-keeping sections and welfare sections, sales departments as well as those engaged in the purchase of raw materials, etc. or the purchase of fixed assets for the factory, as well as watch and ward staff.

^(c) Total persons engaged include the employees as defined above and all working proprietors and their family members who are actively engaged in the work of the factory even without any pay, and the unpaid members of the cooperative societies who worked in or for the factory in any direct and productive capacity. The number of workers or employees is an average number obtained by dividing man-days worked by the number of days the factory had worked during the reference year.

n.a. = data not available.

Source: Government of India, Ministry of Statistics and Programme Implementation: *Annual survey of industries (ASI)*, 2001–09.

² S. Athreye, D. Kale and S.V. Ramani: *Experimentation with strategy and the evolution of dynamic capability in the Indian pharmaceutical sector*, UNU-MERIT Working Paper No. 2008-041 (Maastricht, UNU-MERIT, 2008).

3.1.7. Employment in Japan

- 76.** The Japanese chemical industry, including the pharmaceutical sector, employed nearly 1.1 million people at its peak in 1993. From 1993 to 2006, the Japanese chemical industry gradually lost a number of jobs. In 2009, it employed approximately 950,000 people. Between 1990 and 2009, the chemical industry lost nearly 80,000 jobs on an accumulated basis. Most of the massive job cuts occurred between 1994 and 2005, the period which coincided with what is known as the “Lost Decade” in Japan. This was a time of no economic growth following the collapse of the Japanese asset price bubbles in the Japanese economy. Employment in the Japanese chemical industry reached a low point in 2006, but then entered a growth period, which continued even through the global economic crisis. Major trends in the Japanese chemical industry can be summarized in the following three points (table 3.9 and figure 3.8).
- 77.** First, most job losses were concentrated in small enterprises. Table 3.9 shows that nearly 80,000 jobs were lost between 1990 and 2009, with around 51,000 jobs, or 64 per cent, occurring in enterprises with fewer than 29 employees. In contrast, medium-sized and large enterprises, with more than 500 employees, gained approximately 113,000 jobs during the same period.
- 78.** Second, similar to employment in the Indian and Chinese chemical industries, employment in the Japanese chemical industry was less affected by the global economic crisis, because many jobs were cut prior to the crisis. Table 3.9 shows that the Japanese chemical industry added more than 65,000 jobs between 2008 and 2009.
- 79.** Third, between 1990 and 2009, the share of employment in small chemical enterprises with fewer than five employees constantly accounted for around 50 per cent of total chemical employment. This ratio was not affected even during the Lost Decade, which indicates that Japan’s chemical industry has a pyramid-shaped supply chain and it relies on many small enterprises for industrial production.

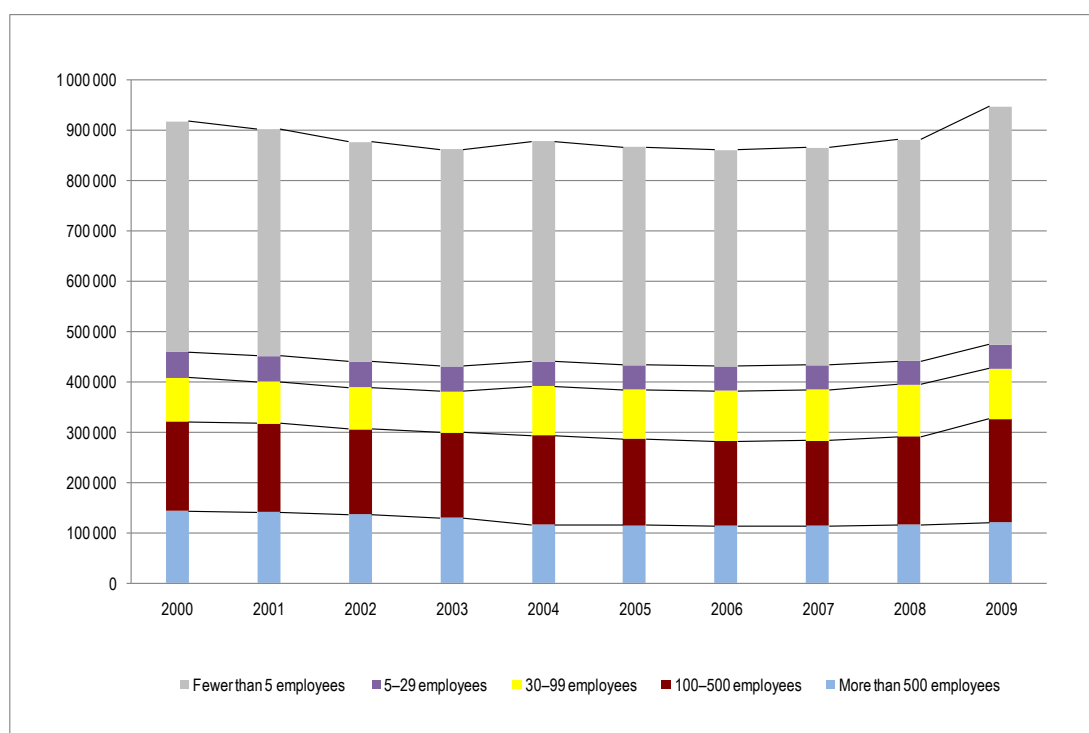
Table 3.9. Employment in the chemical industry in Japan, 1990–2009

Year	More than 500 employees	100–500 employees	30–99 employees	5–29 employees	Fewer than 5 employees	Total	Change
1990	185 930	174 048	93 345	59 879	513 201	1 026 403	
1991	190 694	177 508	92 867	60 352	521 420	1 042 841	16 438
1992	193 734	178 308	94 031	62 164	528 236	1 056 473	13 632
1993	193 180	191 675	96 919	56 209	537 983	1 075 966	19 493
1994	188 483	187 909	101 906	57 362	535 659	1 071 319	-4 647
1995	183 466	187 270	97 843	58 165	526 744	1 053 488	-17 831
1996	180 646	179 393	99 580	58 473	518 093	1 036 185	-17 303
1997	174 463	179 450	97 513	58 542	509 967	1 019 935	-16 250
1998	169 436	174 635	97 891	56 710	498 670	997 342	-22 593
1999	147 816	174 793	95 594	49 707	467 910	935 820	-61 522
2000	143 304	177 293	88 114	50 385	459 096	918 192	-17 628
2001	140 283	176 942	82 597	51 664	451 485	902 971	-15 221
2002	135 676	170 599	82 216	50 539	439 032	878 062	-24 909
2003	128 995	169 909	82 179	50 154	431 236	862 473	-15 589
2004	116 322	177 195	97 519	48 445	439 479	878 960	16 487

Year	More than 500 employees	100–500 employees	30–99 employees	5–29 employees	Fewer than 5 employees	Total	Change
2005	114 927	171 107	98 069	49 426	433 529	867 058	-11 902
2006	113 835	168 215	99 664	49 330	431 044	862 088	-4 970
2007	113 627	169 942	100 605	49 178	433 353	866 705	4 617
2008	115 685	176 134	101 927	47 458	441 203	882 407	15 702
2009	119 904	206 702	99 871	47 582	474 060	948 119	65 712
Total employment change between 1990 and 2009							-78 284

Source: Government of Japan, Ministry of Health, Labour and Welfare: Monthly labour surveys.

Figure 3.8. Employment in the chemical industry in Japan, by company size, 2000–09



Source: Government of Japan, Ministry of Health, Labour and Welfare: Monthly labour surveys.

3.1.8. Women workers in the chemical industry

80. Table 3.10 on the female employment ratio in the chemical industry presents data gathered from about 23 ILO member States. Although data is scarce on the number of women workers employed globally, the limited figures available suggest that the number of women employed in the chemical industry is low. Chemical companies have endeavoured to increase female participation in their workforce. At BASF, there was an increase from 17.4 per cent female employees in 2005 to 19.3 per cent in 2010.³ At Univar, about 40 per cent of total employees in 2010 were women.⁴ Atanor reported that the number of women

³ Information provided to the ILO by BASF SE.

⁴ D. Prangenber: “Chemical sector becoming more appealing to women”, in *ICIS Chemical Business* (Sutton, Surrey), 18 May 2010, p. 31.

working as technicians and analysts at headquarters had increased in recent years.⁵ Borealis reported that whenever manpower reduction measures took place, they were carried out in a gender-neutral way.⁶ UBE Chemical Europe stated that there was no gender discrimination in their employees' career development paths.⁷ Solvay Ibérica stated that the company took affirmative action to employ more women workers.⁸

- 81.** Current limited female participation in the chemical industry means that it will be many years before women break the glass ceiling in this industry. Table 3.11 shows that 13.4 per cent of the 396 directors at United States chemical companies in 2009 were women. Although this result was a slight improvement on the previous year (13.2 per cent in 2008), the percentage of female executive officers was as low as 9.6 per cent in the chemical industry, compared with 13.5 per cent of female executive officers at Fortune 500 firms.⁹ One major pharmaceutical firm in Germany allowed working mothers to have flexible, reduced work hours in order to pursue their careers. However, it was difficult for women to work in higher management positions because of a lack of firmly established work-life balance initiatives to meet their various needs.¹⁰

Table 3.10. Female employment share in the basic chemical industry, selected countries, 2000–07
(percentage)

	2000	2001	2002	2003	2004	2005	2006	2007
Albania	14.97	28.93	46.48	22.07	42.05	33.83	28.66	n.a.
Azerbaijan	39.03	36.06	37.52	36.67	37.77	38.11	36.24	36.36
Botswana	34.72	22.12	39.43	27.03	25.29	26.44	30.94	n.a.
Bulgaria	31.17	28.46	28.00	28.91	29.66	30.06	30.53	30.54
Chile	n.a.	8.14	9.35	8.85	8.67	8.71	9.84	n.a.
Croatia	18.98	18.60	18.31	17.62	17.88	18.08	17.76	18.09
Ecuador	n.a.	n.a.	14.09	15.01	13.11	15.39	n.a.	n.a.
Ethiopia	10.18	9.16	8.43	8.92	10.76	12.11	12.29	13.54
India	0.78	0.56	0.50	0.69	0.82	0.77	n.a.	n.a.
Indonesia	11.28	12.80	13.52	12.01	12.59	11.98	13.39	n.a.
Iran, Islamic Republic of	3.56	5.02	4.91	4.99	6.18	5.74	n.a.	n.a.
Kazakhstan	36.06	37.30	33.16	35.09	38.24	36.30	37.50	37.24
Jordan	2.22	16.38	20.25	2.43	3.03	2.80	2.54	2.25
Kyrgyzstan	10.23	7.14	22.54	24.40	24.76	29.01	28.41	24.35

⁵ Information provided to the ILO by Atanor SCA.

⁶ Information provided to the ILO by Borealis AG.

⁷ Information provided to the ILO by UBE Chemical Europe SA.

⁸ Information provided to the ILO by Solvay Ibérica SL.

⁹ A.H. Tullo: "Women in industry", in *C&EN* (Washington, DC, American Chemical Society), 9 Aug. 2010, pp. 16–17.

¹⁰ S. Plass: "Wage gaps for women frustrating Germany", in *The New York Times* (New York, NY), 3 Sep. 2008.

	2000	2001	2002	2003	2004	2005	2006	2007
Lithuania	n.a.	n.a.	n.a.	28.91	28.93	28.80	28.63	28.19
Madagascar	n.a.	11.15	11.15	11.17	11.17	11.16	11.18	n.a.
Malaysia	19.04	19.75	17.73	18.55	18.06	18.72	17.53	n.a.
Morocco	6.32	5.17	13.33	5.23	4.46	5.42	5.46	5.56
Oman	1.13	0.66	0.79	1.11	4.53	2.40	n.a.	n.a.
Qatar	1.22	0.89	1.32	0.83	2.64	2.94	3.14	n.a.
Viet Nam	n.a.	44.15	41.96	41.25	39.95	39.39	39.48	38.60
Thailand	34.66	n.a.	32.05	n.a.	n.a.	n.a.	34.22	n.a.
Tanzania, United Republic of	n.a.	n.a.	n.a.	42.24	22.85	23.01	22.95	23.05

n.a. = not available.

Source: UNIDO: INDSTAT4, 2010 ISIC Rev.3.

Table 3.11. Women in management in the oil and gas and chemical industries in the United States, 2009

Company	Board of directors				Women in management				Function
	Women		Total		CEO	CFO	Executive officers		
	Inside ^(a)	Outside	Women	Board			Women	Total	
Air Products & Chemicals	0	2	2	11	0	0	1	9	Senior VP, human resources and communications
Albemarle	0	2	2	10	0	0	0	14	
Arch Chemicals	0	1	1	7	0	0	2	9	Senior VP, strategic development and chief legal counsel; controller
Ashland	0	2	2	11	0	0	2	12	VP, human resources and communications; VP, chief information and administrative services officer
Cabot	0	1	1	13	0	0	0	5	
Cambrex	0	2	2	9	0	0	0	5	
Celanese	0	1	1	9	0	0	2	9	Executive VP; senior VP, human resources
CF Industries	0	0	0	8	0	0	1	9	VP, human resources
Chemtura	0	0	0	8	0	0	2	8	Senior VP, general counsel and secretary; VP and treasurer
Cytec Industries	0	2	2	11	0	0	1	7	VP, human resources
Dow Chemical	0	3	3	12	0	0	1	14	Senior VP, basic chemicals
DuPont	1	2	3	12	1	0	1	8	CEO
Eastman Chemical	0	1	1	12	0	0	1	10	Senior VP, chief legal officer and corporate secretary
ExxonMobil	0	2	2	10	0	0	0	19	
Ferro	0	2	2	12	0	1	2	6	VP and chief financial officer; VP, human resources
FMC	0	1	1	11	0	0	1	8	VP, general counsel and secretary
H.B. Fuller	0	1	1	7	0	0	1	10	VP, human resources
Georgia Gulf	0	0	0	8	0	0	0	9	
Goodyear	0	3	3	12	0	0	2	20	VP, government relations; VP, business development

Company	Board of directors				Women in management				Function
	Women		Total		CEO	CFO	Executive officers		
	Inside ^(a)	Outside	Women	Board			Women	Total	
W.R. Grace	0	1	1	9	0	0	1	8	VP, chief human resource officer
Honeywell	0	1	1	10	0	0	1	9	Senior VP and general counsel
Huntsman Corp.	0	1	1	10	0	0	1	20	VP and chief information officer
Innophos	0	2	2	7	0	0	1	13	VP, human resources
Koppers	0	2	2	8	0	0	2	12	VP, safety and environmental affairs; treasurer
Kronos Worldwide	0	0	0	7	0	0	1	11	VP and tax director
Lubrizol	0	1	1	10	0	0	1	16	Corporate secretary and counsel
Monsanto	0	2	2	11	0	0	4	15	Senior VP, chief of staff and community relations; VP, investor relations; VP, vegetable business; VP, finance, seeds and traits
Mosaic	0	1	1	13	0	0	2	10	VP, public affairs; VP, human resources
Nalco	0	1	1	8	0	0	1	8	Chief marketing officer and group VP, commercial operations for water and process services Americas
NewMarket	0	1	1	7	0	0	0	8	
Occidental Petroleum	0	1	1	13	0	0	0	10	
Omnova	0	0	0	8	0	0	0	6	
PPG Industries	0	2	2	10	0	0	1	9	Senior VP, glass and fibre glass
Praxair	0	2	2	10	0	0	0	9	
Rockwood Specialties	0	1	1	7	0	0	0	3	VP, strategy and corporate development
Sigma-Aldrich	0	1	1	11	0	0	1	14	
Solutia	0	0	0	8	0	0	0	7	
Stepan	0	0	0	7	0	0	0	8	
Sterling Chemicals	0	0	0	7	0	0	1	6	VP and controller

Company	Board of directors				Women in management				Function
	Women		Total		CEO	CFO	Executive officers		
	Inside ^(a)	Outside	Women	Board			Women	Total	
Sunoco	1	2	3	8	1	0	2	11	CEO; senior VP, refining
Tronox	0	0	0	7	0	0	0	4	
Westlake Chemical	0	1	1	7	0	0	0	10	
59	2	51	53	396	2	1	40	418	

^(a) = a director who is also a company executive. CEO = Chief Executive Officer. CFO = Chief Financial Officer. VP = Vice-President.

Source: A.H. Tullo: "Women in industry", in *C&EN* (Washington, DC, American Chemical Society), 9 Aug. 2010, p. 17.

3.1.9. Shortages of skilled workers

82. In the world chemical industry, there are still shortages of two types of workers: scientists and skilled craft workers. A training consultancy firm for the chemical industry reported that chemical firms were appealing to a younger workforce by offering an attractive recruitment package. This included: a corporate culture that emphasized social responsibility and diversity; a way to make a difference in the world; recognition for a job well done; the ability to learn and grow through professional development and advancement; flexible working hours that could involve staggered work schedules or telecommuting; and an environment in which young people could have fun with new and innovative projects. Retaining talented workers and attracting younger workers are major challenges. Chemical firms have been making people-oriented aspects a priority in their corporate strategy. Competitive salary and benefits packages are important. Some chemical firms additionally offer longer vacation times, improved mentoring programmes, greater benefits packages and increased job training. In addition, the key to retaining top talent is to create a work environment in which people can be productive, enjoy their jobs, and want to continue. Many chemical firms are also retraining their managers and senior staff so that they are better able to see the talent that exists in young people, who are much more globally minded and broader thinking, and already have much technical expertise.
83. There has been some growth in the number of chemistry graduates in certain countries in recent years. For example, in the United States, according to surveys by the American Chemical Society's Committee on Professional Training, the number of bachelor's degree and PhD holders is gradually increasing; however, the number of master's degrees defied that trend. A record 2,543 new PhDs were awarded by United States universities in 2009, a rise of 7.7 per cent from 2007–08. The number of master's degrees fell by 3.2 per cent to 1,986, which is essentially the same as the number of master's graduates reported more than a decade ago.¹
84. The chemical industry in emerging economies is also facing a serious shortage of scientific staff, due to the increasing demand for R&D. In India, four principle pharmaceutical firms – Ranbaxy Laboratories Ltd, Dr Reddy's Laboratories, Nicholas Piramal India Ltd, and Lupin Laboratories Ltd – have increased R&D investment since 2000 and established laboratories dedicated to developing new medicines. Table 3.12 shows R&D intensity as a percentage of R&D investment to turnover, from 2000 to 2006, for these companies. Ranbaxy was the largest investor in R&D, reaching US\$144.40 million in 2006, while Dr Reddy's Laboratories increased R&D intensity steadily and sharply from 2000 to 2006, reaching 17.12 per cent in 2004. The number of scientists working in these firms grew accordingly in the past decade. These firms were heavily recruiting scientists and engineers to create a critical mass of innovative R&D-experienced scientists. As a result, the percentage of staff working in R&D has grown consistently (table 3.13).

¹ D.J. Hanson: "Gains continue for chemistry grads: Strong growth in bachelor's degrees spills into doctorates", in *C&EN* (Washington, DC, American Chemical Society), 23 Aug. 2010, pp. 44–47.

Table 3.12. Research and development (R&D) intensity as a percentage of R&D investment to turnover in the major pharmaceutical firms in India, 2000–06

Firm	No. of R&D labs	2000	2001	2002	2003	2004	2005	2006
Ranbaxy Laboratories Ltd	3	4.2	3.8	5.2	6.1	9.35	17.41	13.28
Dr Reddy's Laboratories	5	4.22	6.29	7.7	10.0	17.12	10.85	9.0
Nicholas Piramal India Ltd	2	1.8	2.16	1.63	3.9	8.29	6.04	5.1
Lupin Laboratories Ltd	1	n.a.	2.41	3.5	4.0	7.2	6.7	7.2

n.a. = not available.

Source: D. Kale: "International migration, knowledge diffusion and innovation capacities in the Indian pharmaceutical industry", in *New Technology, Work and Employment* (Hoboken, NJ, John Wiley & Sons Inc.), Vol. 24, No. 3, Nov. 2009, pp. 260–276.

Table 3.13. Ratio of R&D scientists to total employees numbers in the major pharmaceutical firms in India, 2000–06

Firm	2000	2001	2002	2003	2004	2005	2006
Ranbaxy Laboratories Ltd	8.85	9.02	11.11	13.52	9.75	10.36	9.69
Dr Reddy's Laboratories	n.a.	9.09	12.39	n.a.	n.a.	n.a.	10.45
Nicholas Piramal India Ltd	2.66	3.38	4.53	4.33	4.60	5.04	5.20
Lupin Laboratories Ltd	n.a.	n.a.	5.45	6.11	5.40	n.a.	6.66

n.a. = not available.

Source: D. Kale: "International migration, knowledge diffusion and innovation capacities in the Indian pharmaceutical industry", in *New Technology, Work and Employment* (Hoboken, NJ, John Wiley & Sons Inc.), Vol. 24, No. 3, Nov. 2009, pp. 260–276.

85. India attempted to solve the shortage of a skilled workforce by “reverse brain drain”, inviting skilled workers from developed economies. In India, scientists are particularly scarce in the chemical and pharmaceutical industries. Therefore, the mobility of foreign-educated experts or scientists is crucial to the development of the industries. Talented immigrants who have studied and worked in Europe and the United States are increasingly reversing the brain drain, transforming developing countries into global leaders. Indian scientists continue to migrate from India to the United States, principally for educational opportunities, obtaining advanced skills in the United States, and they migrate at an earlier age.²

86. Another mismatch is caused through the chemical industry being unable to relocate unemployed scientists into new jobs within the chemical industry. M&A have resulted in thousands of young chemists losing their jobs. Instead of seeking alternative jobs within the industry, some of these workers have moved out of the chemical industry to repurpose their education, skills and experience, or to return to university and move into new fields that are sometimes on the periphery of, or outside, the chemical industry. Some of them have shifted to new jobs in regulatory, clinical or quality functions, or have moved into teaching at universities.³

² W.S. Harvey: “British and Indian scientists moving to the United States”, in *Work and Occupations* (Thousand Oaks, CA, SAGE Publications), Vol. 38, No. 1, Feb. 2011, pp. 68–100.

³ S.J. Ainsworth: “Leaping to new opportunities: In an unfavorable pharma job market, many chemists are migrating to new careers”, in *C&EN* (Washington, DC, American Chemical Society), 27 Sep. 2010, pp. 75–78.

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- 87.** Chemical firms in advanced economies are also recruiting talented workers outside their own countries. For example, German specialty group Henkel has been accepting a significantly increasing number of scientific applicants from an international background, resulting in a non-German recruitment level of around 50 per cent in new hiring.⁴ Too many pharmaceutical firms are chasing too few skilled workers, and the gaps have widened in recent years. Firms have transformed R&D management practices by making considerable tangible and non-tangible investments in the development of scientists and by aligning individual careers with the firm's organizational goals. The loss of these skilled workers could potentially worsen the shortage of scientists in the industry in the future.
- 88.** Another immediate problem is to retain skilled craft workers such as pipefitters, boilermakers, ironworkers, carpenters and others skilled at keeping plants running. In addition, these craft workers are highly mobile, because many of their skills are applicable not only to the chemical industry but also to several other industries, which means that competition for these workers is fierce. There is a lack of craft workers worldwide, largely due to shifts in demographics, education and training values in the general population. For example, there has been a gradual shift in the education systems in the United States and some European countries, as many have de-emphasized such craft skills. There is also a lack of professional technical schools. Because public vocational training programmes have declined in the United States, chemical companies have had to spend more resources and time than they once did to train their workers for craft jobs.
- 89.** Chemical firms are now taking a proactive approach to tackling the shortage of talented workers. Like many other countries, the United States is vulnerable as it turns away from craft and vocational training to more service-oriented professions. Talent management, including craft worker talent, is a main concern for the National Petrochemical and Refiners Association Maintenance Committee, which has begun to hold annual labour outlook meetings to encourage discussion and seek solutions. Chemical firms are also training new craft workers under their own initiatives. One of their major initiatives is the Gulf Coast Workforce Development initiative. The shortage of carpenters, electricians, pipefitters and other craft workers who keep plants running is a particular problem in the United States Gulf Coast region, where reconstruction efforts are ongoing following hurricanes Katrina and Rita in 2005. Many chemical firms signed up for the Gulf Coast Workforce Development initiative, which aimed to recruit and train up to 20,000 new construction workers by the end of 2009 to help in the region's recovery effort. The programme offered free training courses to build skills and prepare for careers in construction. While the programme was just the tip of the iceberg when it came to the number of craft workers needed in the Gulf region, it is expected to help greatly in attracting new talent. This is a collective action by all stakeholders in the chemical industry, with member companies contributing US\$5 million to the initiative by 2011. Other contributors include construction trade groups, trade unions, academic institutions, and government.⁵
- 90.** Past experience suggests that the chemical industry needs to prepare for the long-term future. In addition to recruitment policies, the industry must develop industry-wide support programmes to maintain the performance, flexibility and productivity of employees, particularly as demographic changes in many chemical-producing countries in the near future will affect population structure, including aging.

⁴ C. Shaw: "Recruiting the best", in *ICIS Chemical Business* (Sutton, Surrey), 8–14 Mar. 2010, pp. 30–31.

⁵ E. D'Amico: "Talent management: What's not working", in *Chemical Week* (London and New York, NY), 11–18 Apr. 2007, pp. 19–23.

3.1.10. Enhancing employability – The Global Jobs Pact

91. When restructuring is inevitable, companies have a number of tools available to minimize the social impact on workers. These tools include counselling, skills assessment, training to enhance employability, internal job search, external job search, mobility, creation of small and medium-sized enterprises, early/partial retirement, alternative work schedules, and severance packages. The following case illustrates how some of these tools are actually used.
92. In 2000, the tyre market became severely depressed because of a downward trend in demand for original equipment (i.e. sales to car and truck manufacturers for new vehicles), the number of replacement markets (i.e. sales to dealers' networks), and exports. This market trend was expected to continue, not only in the United Kingdom, but also in the world market. Michelin therefore faced the real prospect of excess production capacity in its global operations, starting in 2002. To adapt industrial capacity to market demand, it decided to close two plants in the United Kingdom in 2001, affecting 1,716 employees. To assist those employees, Michelin UK created a "Jobshop", the main function of which was to help employees in their job search and to acquire new vocational skills, as well as to provide advice on options such as transfers, early retirement, self-employment and management of personal finances. The Jobshop conducted individual interviews with all affected employees. Individual training was provided in effective job search, for instance in writing an appropriate curriculum vitae, filing job application documents, answering job advertisements, and practising job-search techniques (among others, telephone calls and interviews). The Jobshop maintained permanent contact with national employment agencies. Two representatives of the agencies were on the factory site five days a week, directly connected to their database. The Jobshop also contacted other companies for possible placements. In addition to this assistance, Michelin UK provided redundancy premiums that were five times the basic national norm, and helped in small and medium-sized enterprise creation, with special loans at attractive rates. The results, measured in April 2003, showed that of the 1,716 employees affected, 66 per cent had found alternative jobs, 12 per cent had retired, 11 per cent had accepted an internal transfer, 6 per cent had chosen self-employment, 2 per cent had taken full-time education or training, and 0.4 per cent had claimed state assistance. Only 2 per cent were still unemployed.⁶
93. Lessons learned from numerous measures taken in the chemical industry contributed to the Global Jobs Pact, which was adopted at the International Labour Conference in June 2009. This global policy instrument addresses the social and employment impact of the international financial and economic crisis. It promotes a productive recovery centred on investments, employment and social protection. The fundamental objective of the Global Jobs Pact is to provide an internationally agreed basis for policy-making designed to reduce the time lag between economic recovery and a recovery with decent work opportunities. It calls for urgent worldwide action at the national, regional and global levels.⁷ In fact, the chemical industry has taken timely action to tackle the effects of the global economic crisis, proving that the Global Jobs Pact is an appropriate tool. In the three months prior to the adoption of the Global Jobs Pact in June 2009, the European Mine, Chemical and Energy Workers' Federation (EMCEF) and the European Chemical Employers' Group (ECEG) agreed a joint declaration on short-time work and layoffs, calling for prior workforce consultation, training for the workers affected and public support for companies.

⁶ N. Rogovsky et al.: *Restructuring for corporate success: A socially sensitive approach* (Geneva, ILO, 2005), pp. 81–82.

⁷ <http://www.ilo.org/jobspact/lang--en/index.htm> [accessed 20 Mar. 2011].

94. The declaration called for the industry to ensure that:

- layoffs and short-time working should be introduced only after consultation with the workforce and their representatives;
- where layoffs and short-time working occur, every effort should be made to use “the opportunities of this available time” for improving employees’ skills through training and education; and
- training that takes place during layoffs and short-time work (and indeed all training) should be accredited to ensure that “intrinsic skills” are maintained so that, when the economic situation improves, the chemicals and pharmaceuticals sector does not lose vital human resources for the future.⁸

95. During the crisis, enhancing employability is at the centre of focus. In May 2009, the European chemical industry adopted the Joint Declaration on the global economic crisis, calling for governments to take additional measures to maintain or regain the competitiveness of the European chemical industry and its jobs.⁹ BASF stated that training and lifelong learning were effective to increase employability under any circumstances.¹⁰ Evonik provided internal and external training programmes to employees, focusing on the operational needs of specific qualifications and on individual needs.¹¹ Solvay Ibérica stated that training was an investment for the company to improve productivity and competitiveness for the company and employability for employees.¹² In Japan, trade unions in the pharmaceutical industry are urging the Government of Japan to revise the laws causing an effect known as the “drug lag.” According to Kagakuken, a pharmaceutical trade union in Japan, the current law causes a delay of around four years for new drugs being introduced into the Japanese market, as compared to the European and United States markets, and this subsequently prevents the industry from creating more decent jobs.¹³

3.2. Remuneration

3.2.1. Wage system

96. PEMEX stated that rationalization did not cause any changes in the wage system.¹⁴ This may be a rare case, as restructuring frequently does mean some changes to wage systems.

⁸ “European Union: Chemicals social partners agree on short-time work and layoffs”, in *European Employment Review* (Sutton, Surrey), 9 Apr. 2009.

⁹ ECEG and EMCEF: Joint Declaration on the global economic crisis, 13 May 2009, http://ec.europa.eu/employment_social/dsw/public/actRetrieveText.do?id=8769 [accessed 20 Mar. 2011].

¹⁰ Information provided to the ILO by BASF SE.

¹¹ Information provided to the ILO by Evonik Industries AG.

¹² Information provided to the ILO by Solvay Ibérica SL.

¹³ Presentation by President Masafumi Naramoto, Karoken (Japan) to the ICEM World Conference for the Chemical Industries, Istanbul, Turkey, 27–28 October 2010.

¹⁴ Information provided to the ILO by Petróleos Mexicanos.

In Japan, nine major chemical companies stated that following restructuring, wage systems based on seniority or ambiguous criteria were abolished and replaced by new systems, closely linked to workers' actual performances and companies' actual profits. In other words, wages became closely related to measurable performance and actual achievement.¹⁵

- 97.** What are the likely changes to a pay system as a result of mergers? Although it is difficult to generalize what occurs, a case study of the merger of a global pharmaceutical company partially answers this question. This study examines the process in four comparable plants in the pharmaceuticals sector in the United States, the United Kingdom, Germany and Spain. The study is a relatively short-term one, covering the two-and-a-half years following the mergers.
- 98.** First, the pharmaceutical company introduced a global grading system so that the corporate headquarters could influence job classifications in the operating units, particularly for grades above middle managers and senior professionals. Its impact varied from country to country. In the United States, the global grading system led to financial losses for some employees; about 30 professional and managerial workers lost entitlement to stock options. In contrast, there was no evidence of equivalent professional grades in Germany and the United Kingdom losing out as a consequence of regrading. The study reasoned that in Germany and the United Kingdom, the majority of employees, including professionals and some managers, are covered by collective agreements. However, there was no collective representation, nor were there any collective labour agreements at the United States plant.
- 99.** Second, performance-related pay was introduced. Wage system standardization did not occur, because of the differences in the national wage systems in this case. In other words, the merger did not affect the national wage systems. There was no attempt to harmonize pay rates across national borders. Many other aspects, such as sickness pay and holiday entitlement, were left to local management to set in line with local labour markets.¹⁶

3.2.2. Pay levels

- 100.** Figures 3.9–3.12 show the growth in real wage indexes in the major chemical-producing countries in the chemical industry, by region, between 1999 and 2008. These figures include the evolution of real wage indexes of 72 member States of the ILO, the majority of which show an increase in wages in recent years, with the exception of six member States.
- 101.** The average whole-European Union wage increases in the chemical industry had previously stood at 3.8 per cent in 2003; 3.5 per cent in 2004; 3.8 per cent in 2005; 4.8 per cent in 2006; 6.2 per cent in 2007, indicating a rising trend from 2004 and ending in 2008 at 5.5 per cent, with a steeper fall in the rate of increase in 2009 at 3.9 per cent, because of the recession. However, average wage increases in the chemical industry in many countries generally exceed national average increases. In 2008, the pay increase in the European chemical industry was higher than the national average increase for all sectors in ten countries (most notably Bulgaria and Romania), equal to the average increase in two countries, and lower in nine (most notably Slovenia and Slovakia). In 2009, the increase in wages in the chemical industry was higher than the national average increase for all sectors

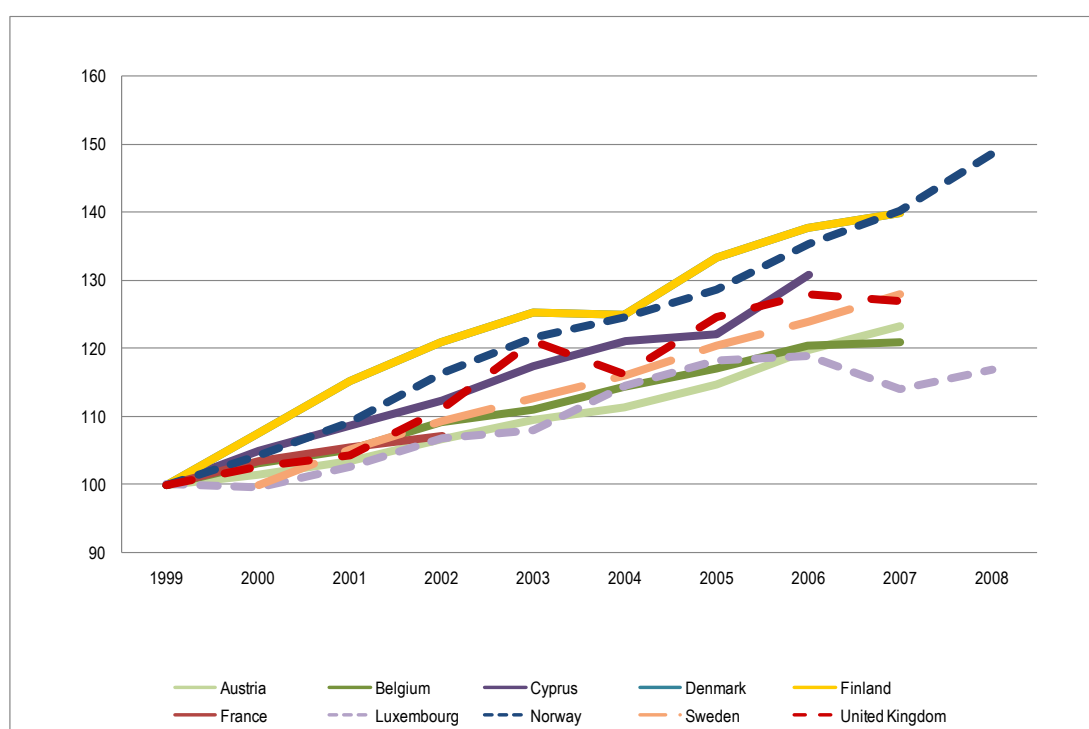
¹⁵ Information provided to the ILO by Nippon Keidanren.

¹⁶ T. Edwards et al.: "National industrial relations systems and cross-border restructuring: Evidence from a merger in the pharmaceuticals sector", in *European Journal of Industrial Relations* (Thousand Oaks, CA, SAGE Publications), Vol. 12, No. 1, Mar. 2006, pp. 69–87.

in five countries (most notably Romania), equal to the average in four countries, and lower in ten (most notably Slovakia, Belgium and Slovenia).¹⁷ However, these wages do not necessarily reflect the reality of wages in M&A.

102. A study by Conyon et al. (2004) examined 190 M&As made by 149 firms, including United Kingdom chemical firms, during 1979–1991. It found that wages could increase their share of the surplus post-merger, and that mergers showed no indication of adversely affecting wages. Wages might even increase in the short-term after M&A. On average, the impact of acquisitions was to increase average wages by 11 per cent in the acquiring firms, two years after merger; much of the observed increase was due to the positive impact that related acquisitions had on wages, which were boosted by 14 per cent. They also found that the impact of a merger was greatest when the size of the acquirer was small. Conversely, workers in large firms benefitted less from acquisition.¹⁸

Figure 3.9. Real wage indexes for the manufacture of chemicals and chemical products in selected Western European countries, 1999–2008 (1999=100)

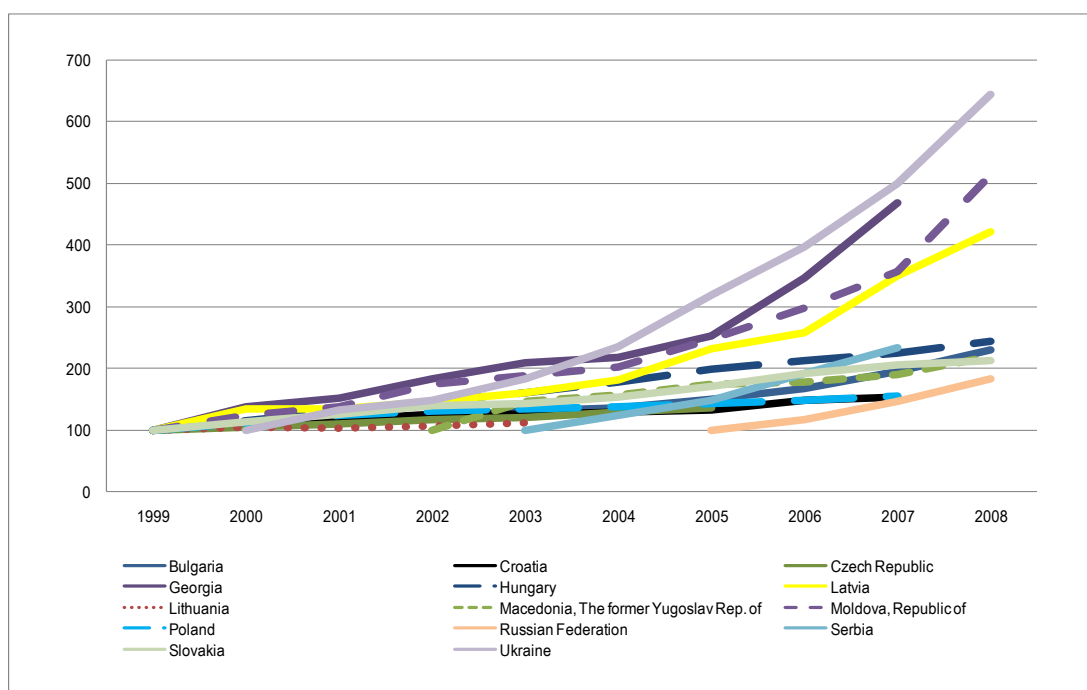


Source: ILO: Laborsta.

¹⁷ European Foundation for the Improvement of Living and Working Conditions: *Pay developments – 2009*, Document EF/10/45/EN (2010), p. 12, <http://www.eurofound.europa.eu/docs/eiro/tn1004029s/TN1004029S.pdf> [accessed 20 Mar. 2011].

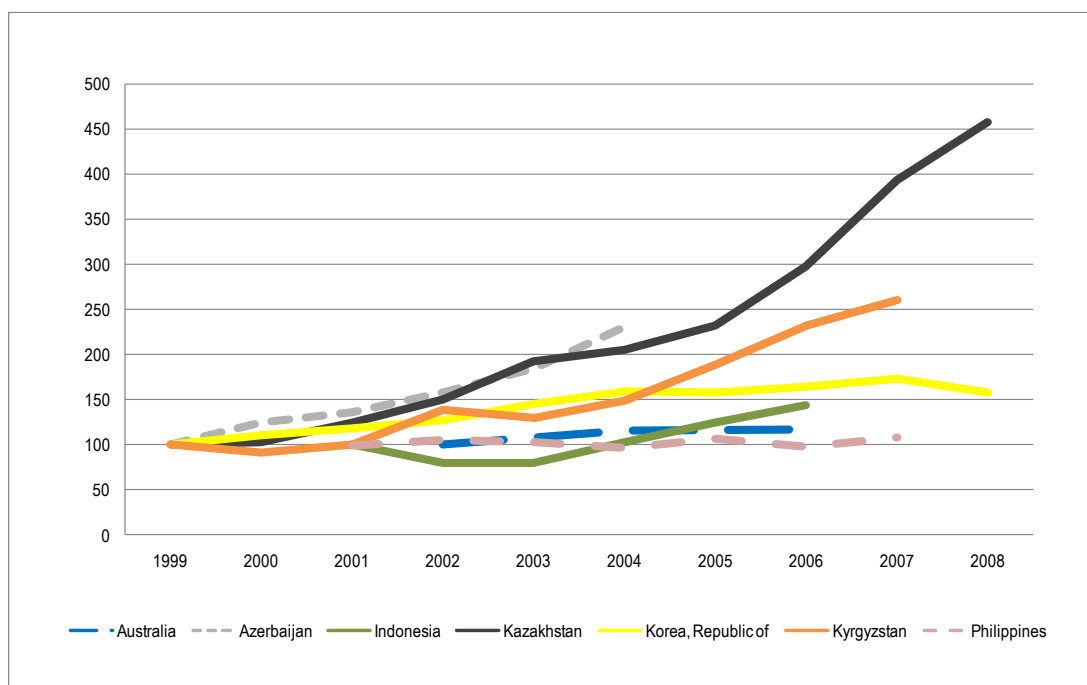
¹⁸ M.J. Conyon et al.: “Do wages rise or fall following merger?”, in *Oxford Bulletin of Economics and Statistics* (Oxford), Vol. 66, No. 5, Dec. 2004, pp. 847–862.

Figure 3.10. Real wage indexes for the manufacture of chemicals and chemical products in selected Eastern and Central European countries, 1999–2008 (1999=100)



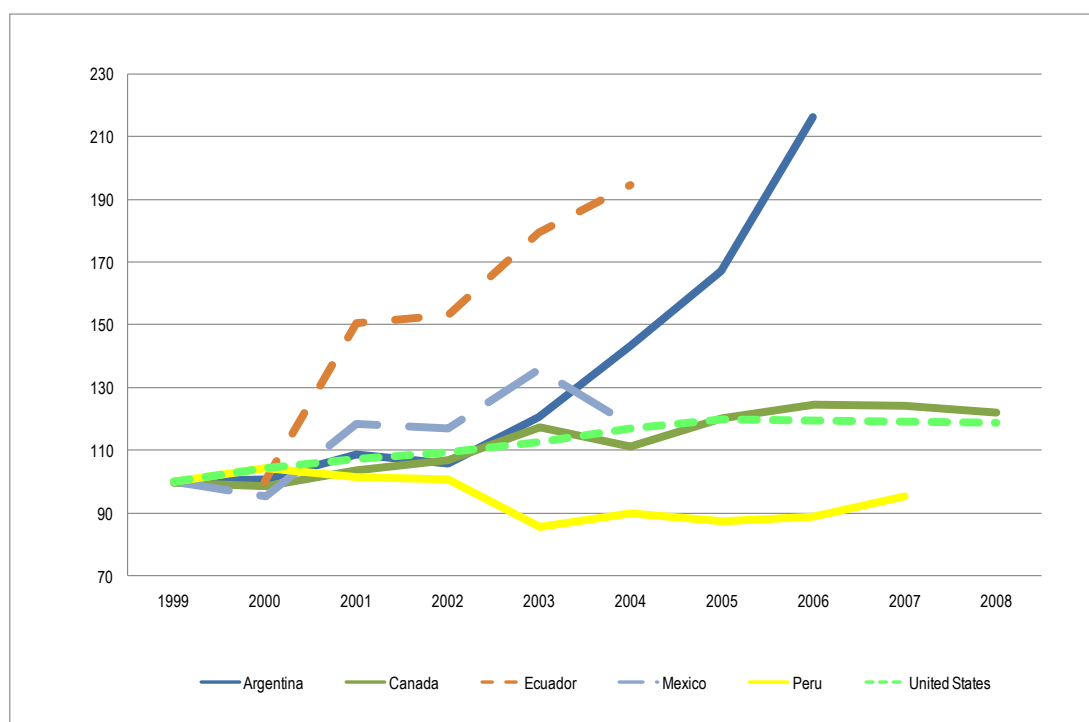
Source: ILO: Laborsta.

Figure 3.11. Real wage indexes for the manufacture of chemicals and chemical products in selected Asian countries, 1999–2008 (1999=100)



Source: ILO: Laborsta.

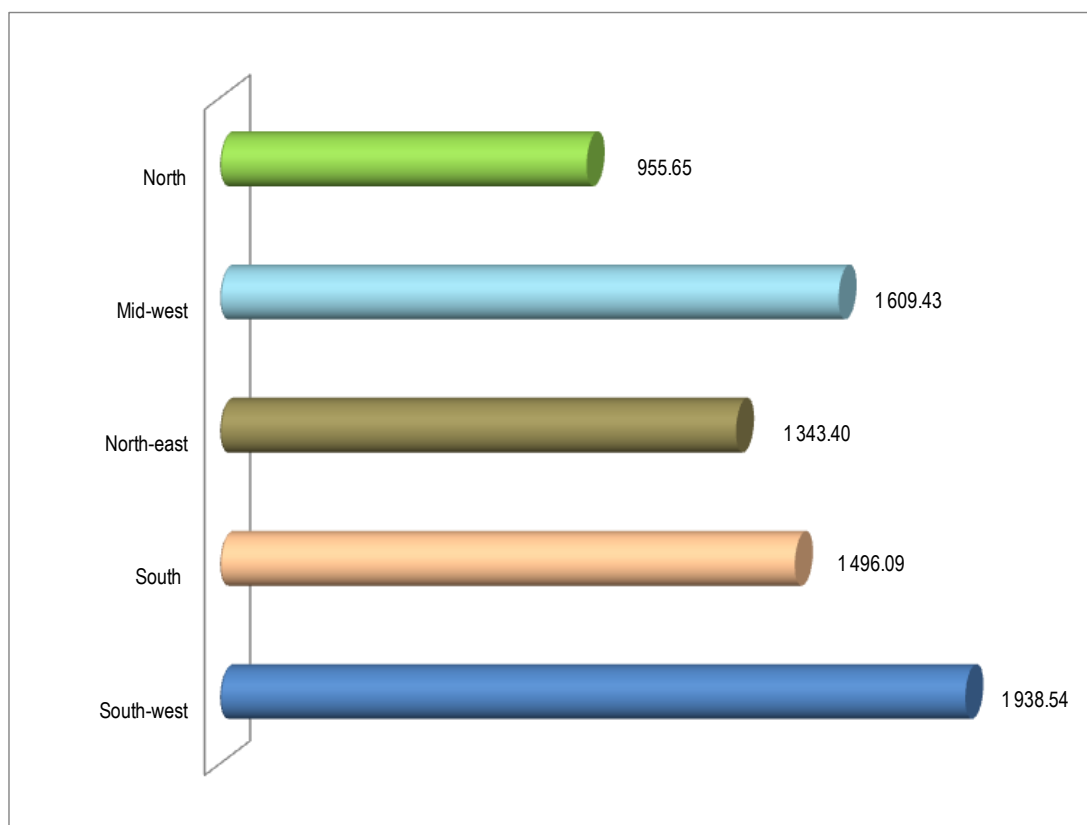
Figure 3.12. Real wage indexes for the manufacture of chemicals and chemical products in selected countries in the Americas, 1999–2008 (1999=100)



Source: ILO: Laborsta.

- 103.** Where decentralized collective bargaining is practised, there can be wide wage gaps in the chemical industry. Figure 3.13 shows average wages, by region, in the chemical industry in Brazil, where wage negotiation is decentralized. It shows that where the chemical industry is heavily concentrated, such as in the south-west region, including São Paulo, chemical wages are the highest in the country. Wages in the south-west are twice as high as in the north.

Figure 3.13. Average wage in the chemical industry in Brazil, by region
(Brazilian real (BRL), as of 31 December 2010)

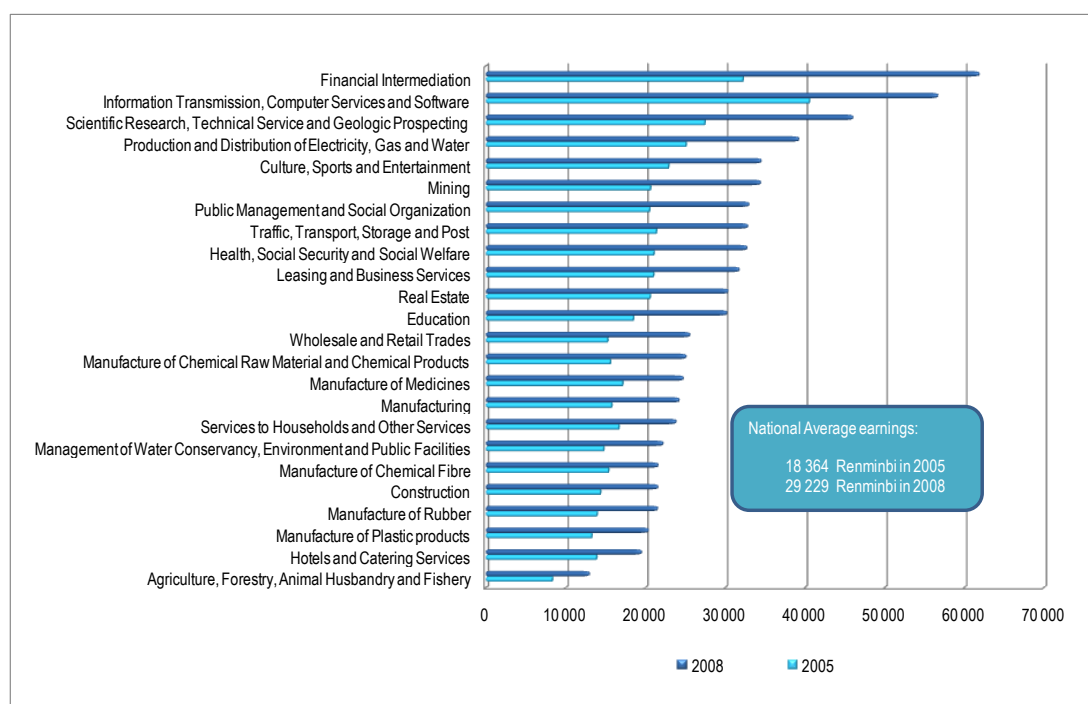


Source: Government of Brazil: Ministry of Labour and Employment.

- 104.** One reason that chemical firms are moving to some countries in Asia is because labour costs are lower than in Western Europe, Japan and the United States. In some countries, chemical workers earn much less than many people working in other industries and service sectors. For example, in China, chemical production workers earned 21,835 Chinese yuan (around US\$3,313) yearly in 2008. This amount was less than the national average of 24,721 yuan (around US\$3,750). Chinese chemical production workers earned about half the amount of financial workers. Chinese pharmaceutical workers earned 21,595 yuan (around US\$3,276), which is slightly less than chemical workers earned. Figure 3.14 shows chemical and pharmaceutical workers' earnings listed in the lower half of the figure. In India, chemical workers' wages have been on the increase in recent years, but the wage level remains relatively low. Daily basic wages for directly employed male workers in the chemical industry have increased by about 30 per cent, rising from 303 Indian rupees (INR) (around US\$7) during 1999 and 2000, to INR432 (around US\$10) during 2006 and 2007.¹⁹ Chemical industries in the rest of the world are competing with these countries, where workers' earnings are substantially less.

¹⁹ National Safety Council of India (NSCI): *Restructuring and social dialogue in the chemical industry in India*, Sectoral Activities Working Paper (Geneva, ILO, forthcoming).

Figure 3.14. Average earnings of employees by sector in China, 2005 and 2008 (yuan)

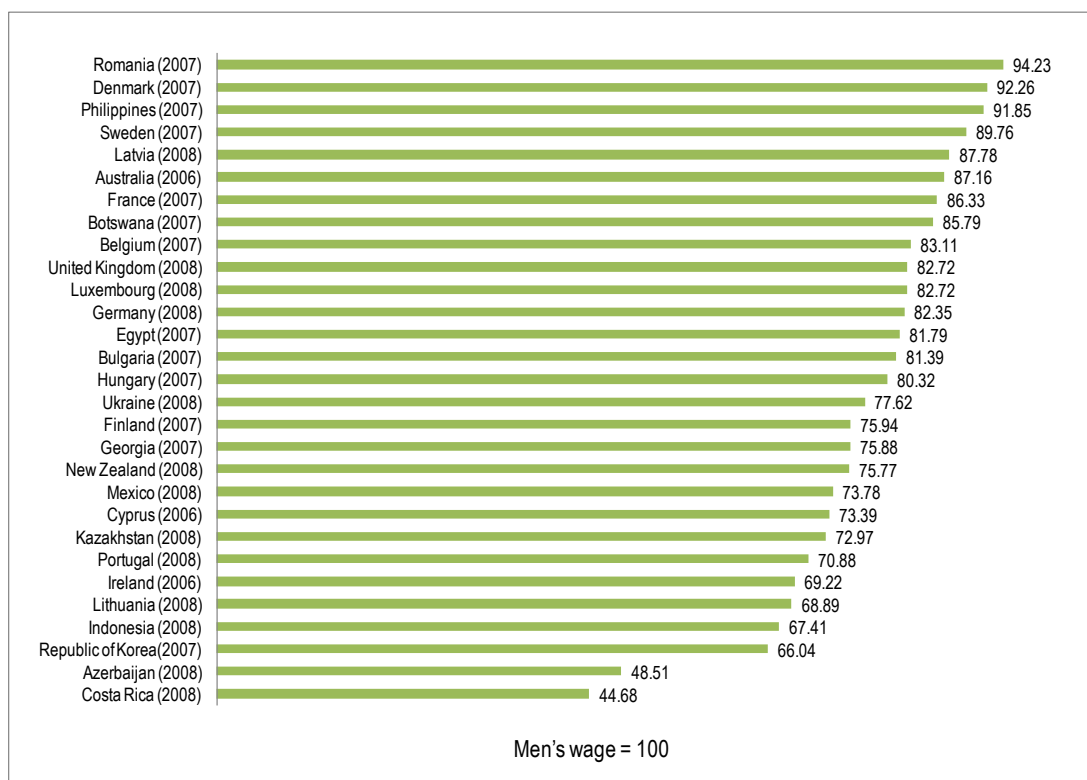


Source: National Bureau of Statistics: *China Statistical Yearbook*, 2005 and 2008.

3.2.3. Gender and remuneration

105. The question of gender equality in remuneration is one of the important human resources policy issues for the chemical industry, not only for reasons of equality, but also because parity in remuneration (equal pay for work of equal value) is a powerful incentive for greater recruitment, retention and full use of skilled women workers in the chemical and pharmaceutical industries. ILO wage data from 29 selected countries shows that gender equality in remuneration has not yet been achieved in many chemical-producing countries.
106. Figure 3.15 shows that, in the manufacture of chemicals and chemical products, gender equality in remuneration still shows a wage gap; and this is regardless of the type of economy, across both North and South. Women workers' remuneration is less than that of men by between 95 per cent and 66 per cent across the member States of the ILO.

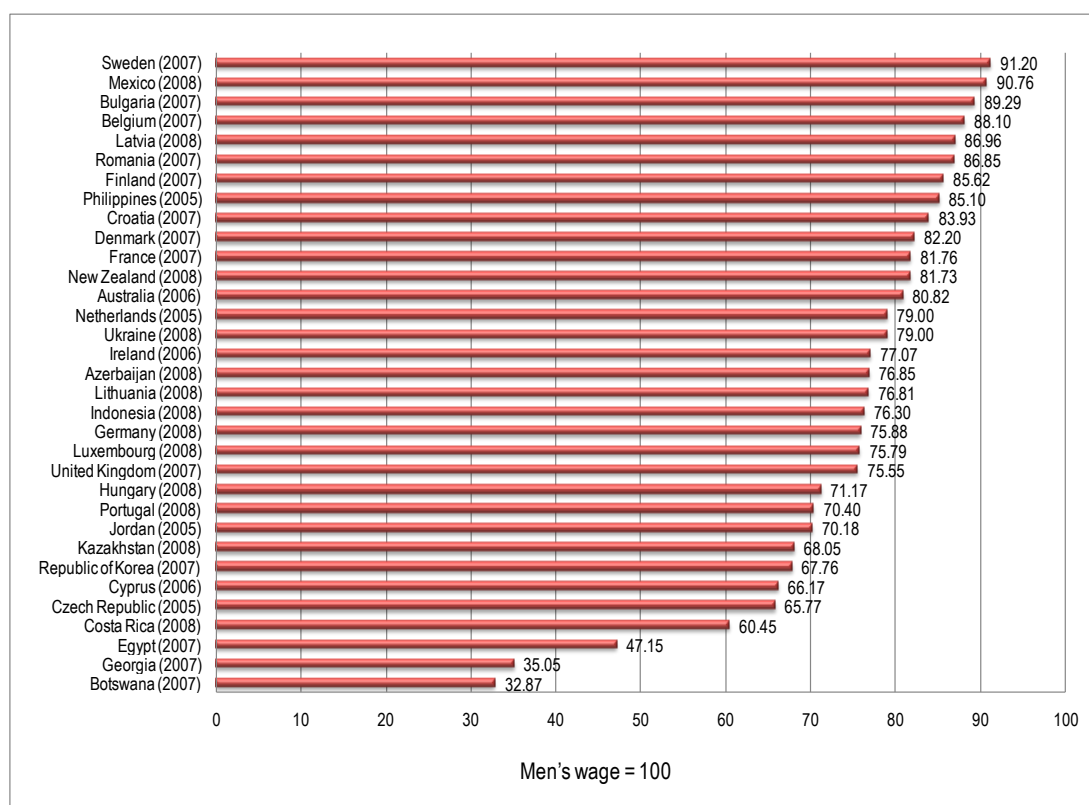
Figure 3.15. Wage gap by gender in the manufacture of chemicals and chemical products in 29 selected countries, latest available year (percentage)



Source: ILO: Laborsta.

107. Similar issues can be seen in the manufacture of rubber and plastic products. The ILO has reliable remuneration data for 33 member States in this sector. Compared to the manufacture of chemicals and chemical products, the wage gap by gender in the manufacture of rubber and plastic products shows a much wider gap across member States (figure 3.16).

Figure 3.16. Wage gap by gender in the manufacture of rubber and plastic products in 33 selected countries, latest available year (percentage)

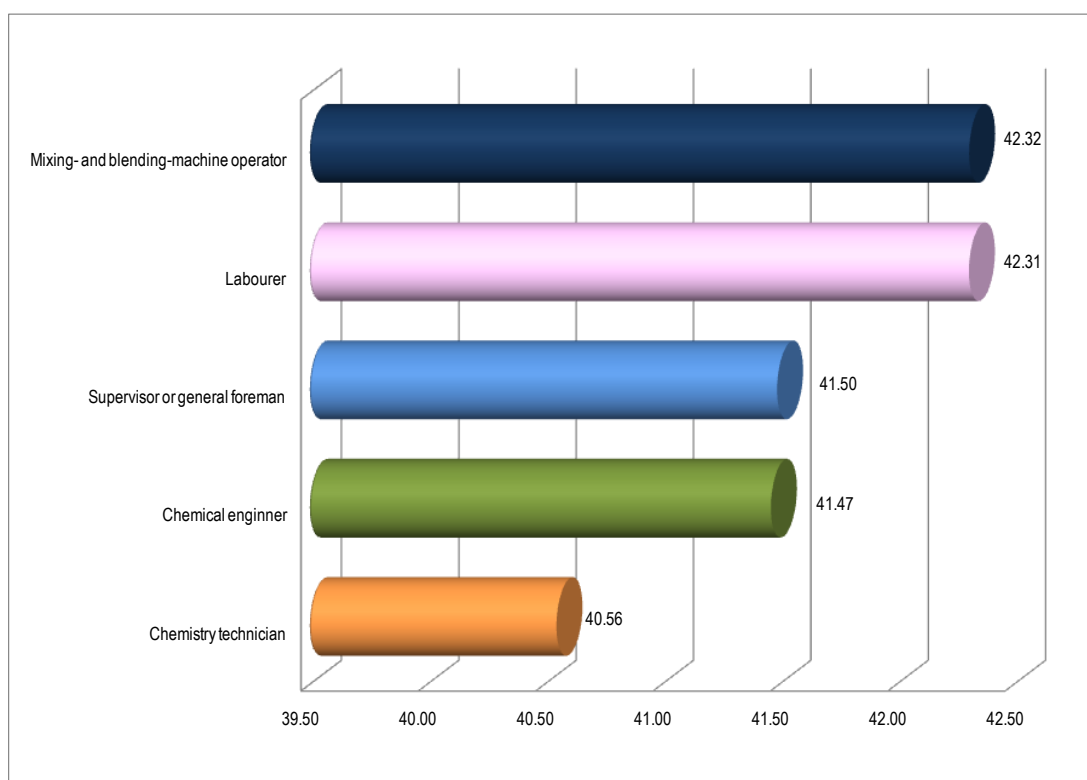


Source: ILO: Laborsta.

3.3. Working time

108. Figure 3.17, highlighting five primary occupations in 35 selected member States of the ILO, shows that chemical workers work over 40 hours a week. Production workers (identified as mixing- and blending-machine operators and labourers) work about 43 hours a week, while supervisors or general foremen and chemical engineers work about 42 hours a week, and chemistry technicians, about 41 hours a week.

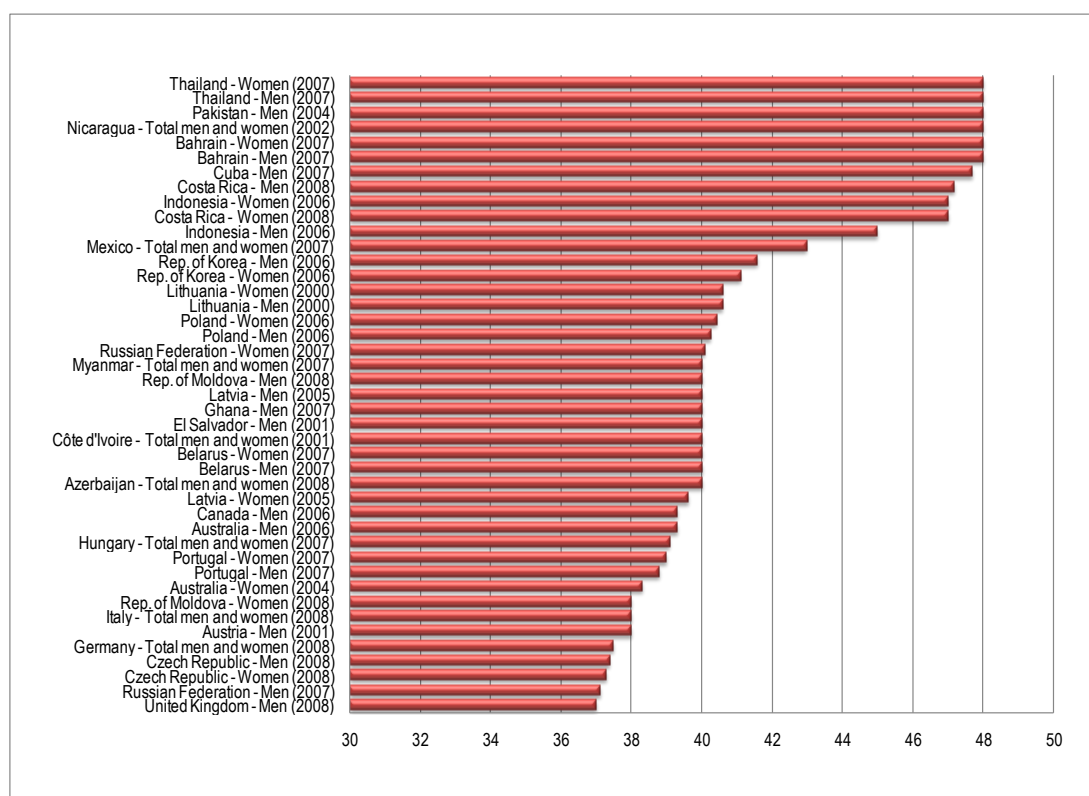
Figure 3.17. Average weekly hours of work, by occupation, in the manufacture of industrial chemicals in 35 selected countries, 2008 (estimated)



Source: ILO, Laborsta.

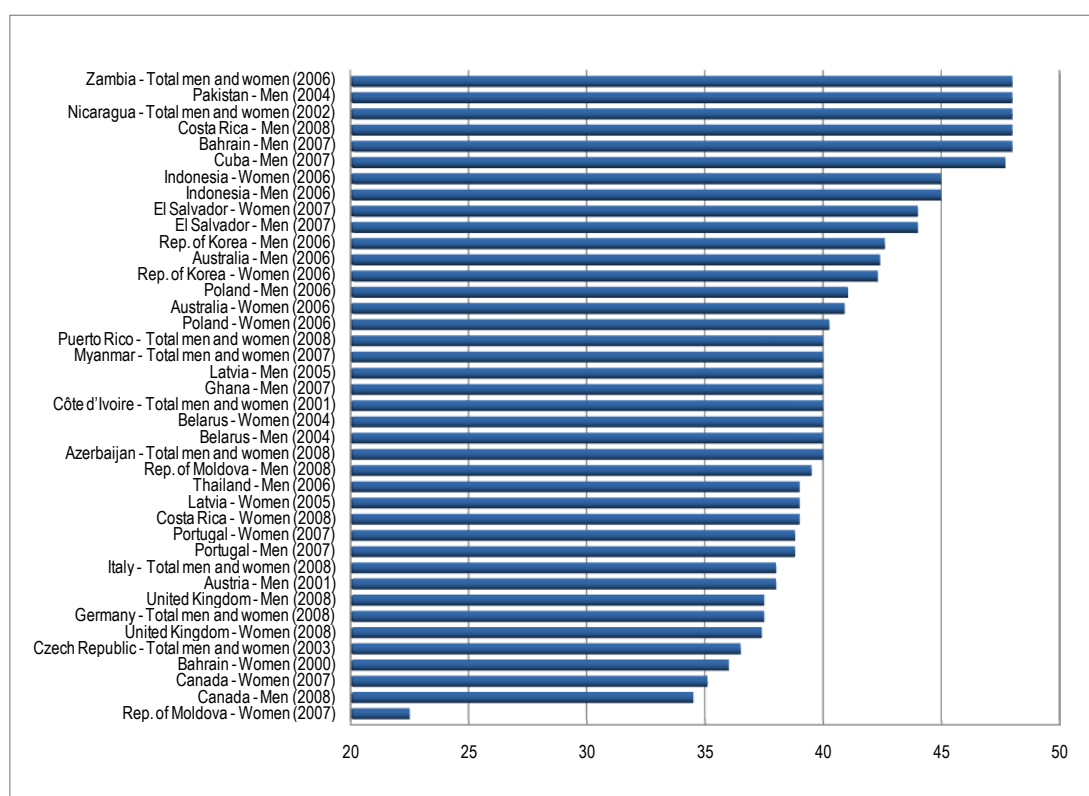
109. Figures 3.18–3.22 show the breakdown of average weekly hours of work in the manufacture of industrial chemicals, by occupation, in selected ILO member States. Generally, workers in developing economies worked longer than their counterparts in developed economies. Long working hours applied equally to men and women in the industry. Chemical engineers in Thailand (both men and women) worked about 48 hours a week, while male chemical engineers in the United Kingdom worked only about 37 hours a week. Chemistry technicians in Zambia (total men and women) worked about 48 hours a week, while female chemistry technicians in the Republic of Moldova worked only about 23 hours a week. Female supervisors or general foremen in Thailand worked about 55 hours a week, while female supervisors or general foremen in the United Kingdom worked only about 37 hours a week. Mixing- and blending-machine operators in Mauritius (total men and women) worked about 53 hours a week, while female mixing- and blending-machine operators in Canada worked only about 33.30 hours a week. Male labourers in Costa Rica worked about 52 hours a week, while female labourers in Canada worked only about 35.30 hours a week.

Figure 3.18. Average weekly hours of work in the manufacturing of industrial chemicals (latest available), selected countries – chemical engineers



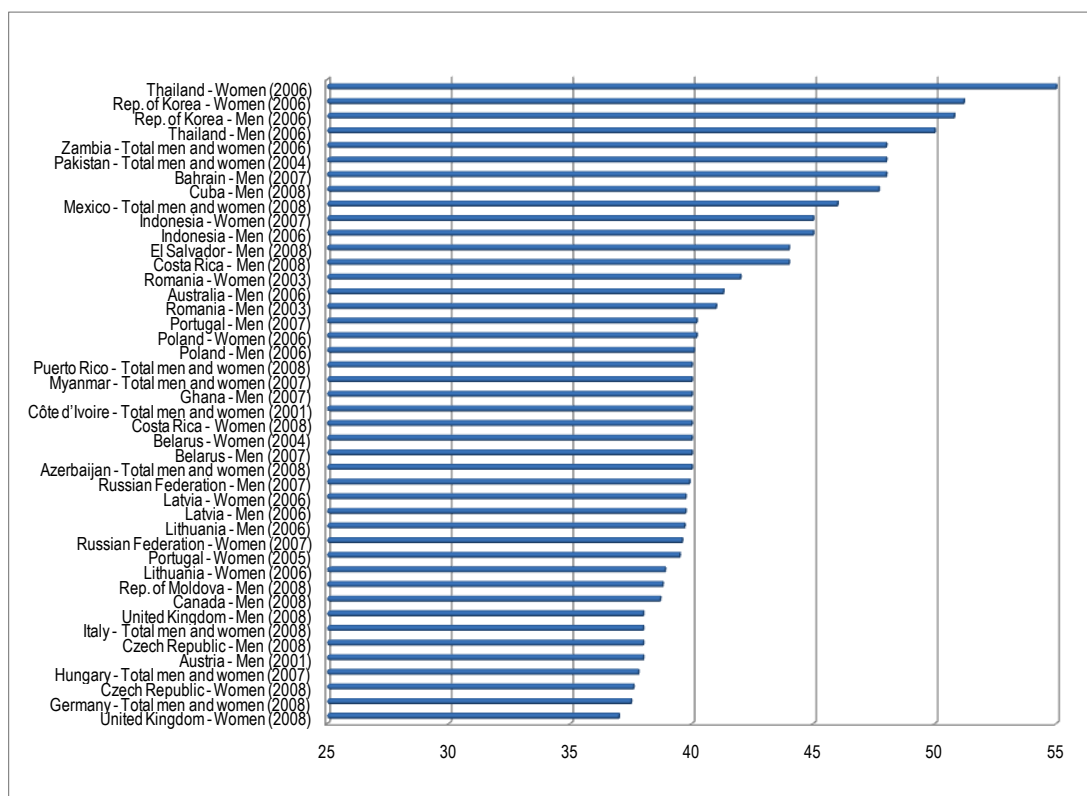
Source: ILO: Laborsta.

Figure 3.19. Average weekly hours of work in the manufacture of industrial chemicals (latest available), selected countries – chemistry technicians



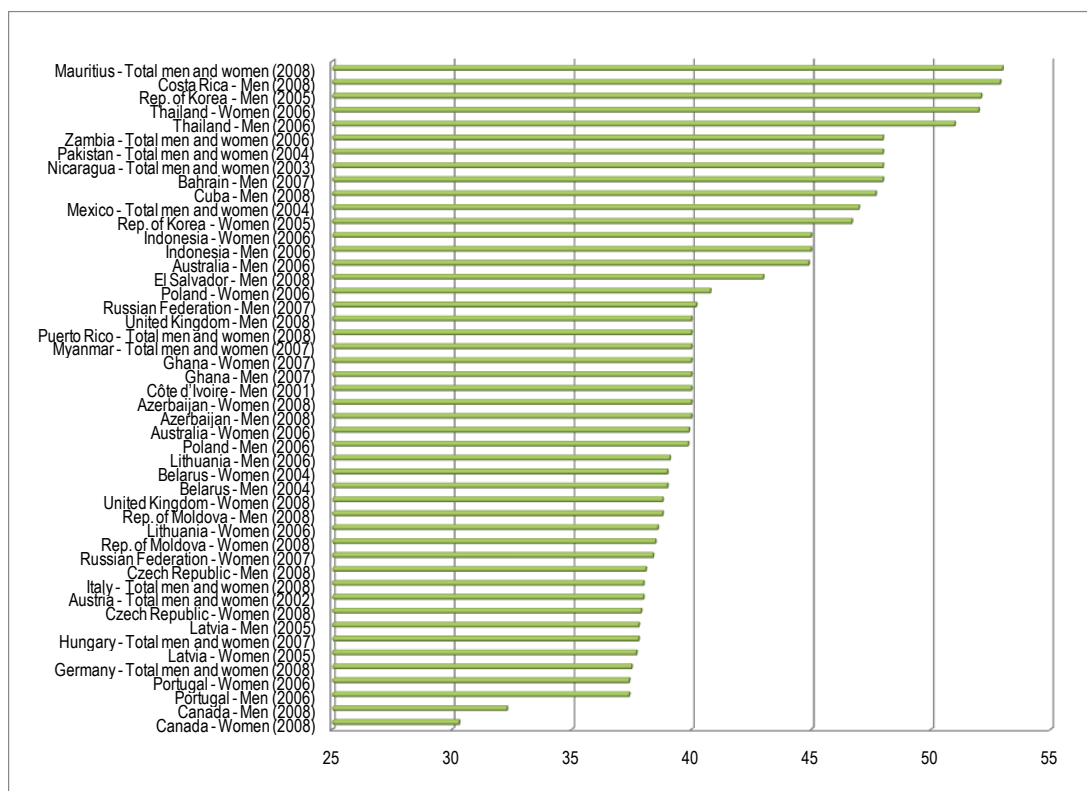
Source: ILO: Laborsta.

Figure 3.20. Average weekly hours of work in the manufacture of industrial chemicals (latest available), selected countries – supervisors or general foremen



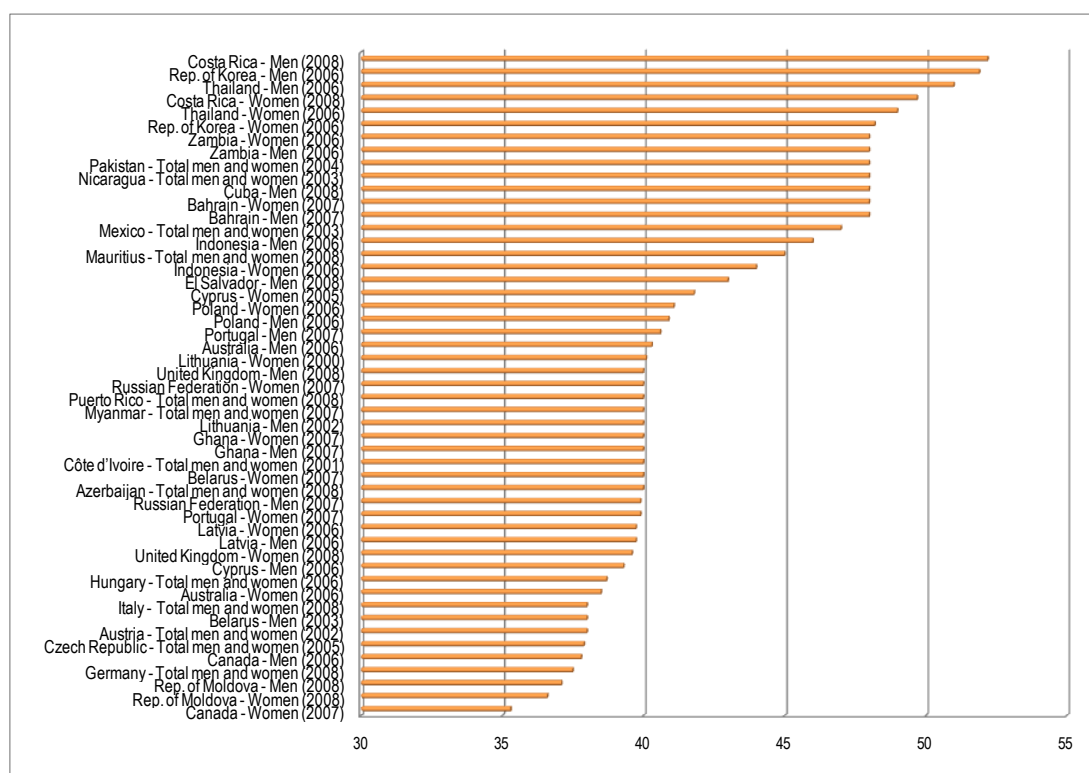
Source: ILO: Laborsta.

Figure 3.21. Average weekly hours of work in the manufacture of industrial chemicals (latest available), selected countries – mixing- and blending-machine operators



Source: ILO: Laborsta.

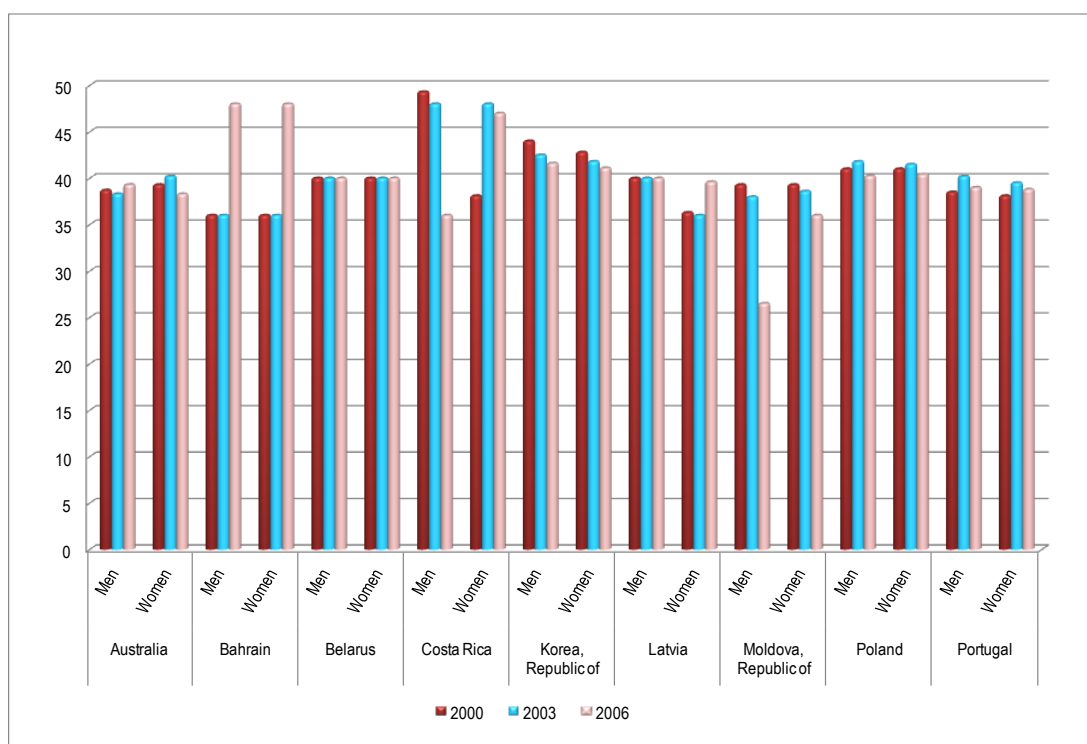
Figure 3.22. Average weekly hours of work in the manufacture of industrial chemicals (latest available), selected countries – labourers



Source: ILO: Laborsta.

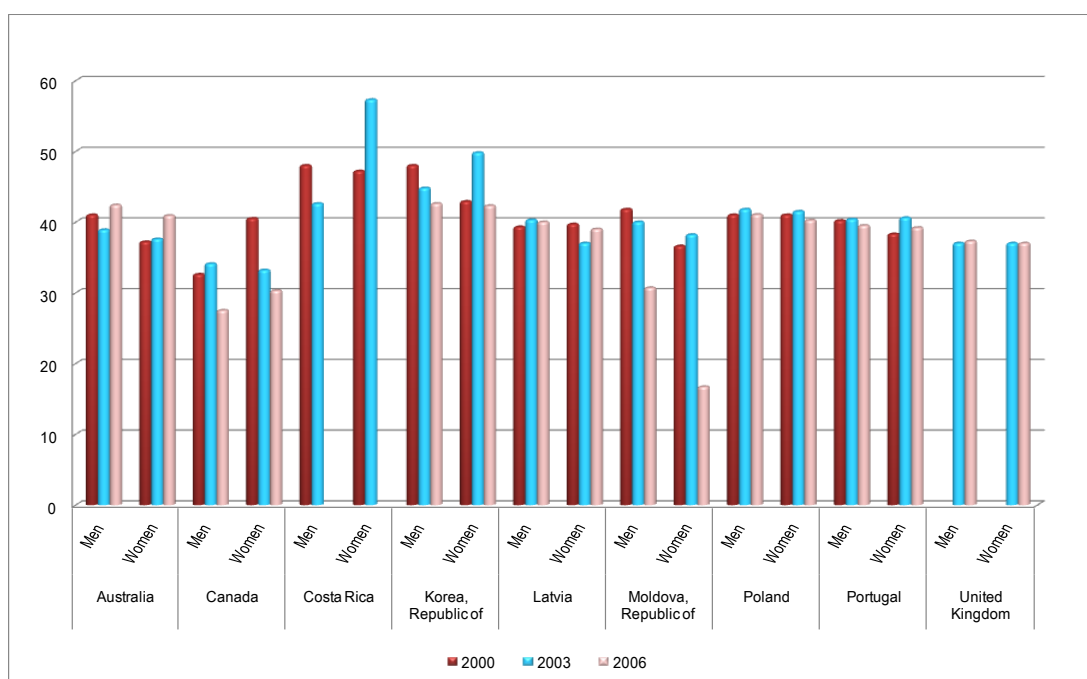
- 110.** Figures 3.23–3.27 show comparisons of average weekly hours of work, by occupation and by gender, in the manufacture of industrial chemicals in selected member States of the ILO for 2000, 2003 and 2006. Most occupations in the selected countries indicate that the average weekly hours of work have remained the same or have been reduced in many ILO member States. However, average weekly hours of work have been increasing for chemical engineers in Bahrain (men and women) and Portugal (men and women); chemistry technicians in Costa Rica (women); supervisors or general foremen in Latvia (men and women) and the Republic of Moldova (men); mixing- and blending-machine operators in the Republic of Korea (men and women) and Latvia (men and women); and labourers in Bahrain (men and women), Latvia (men and women) and the Republic of Moldova (men).

Figure 3.23. Average weekly hours of work, by gender, in the manufacture of industrial chemicals, selected countries – chemical engineers



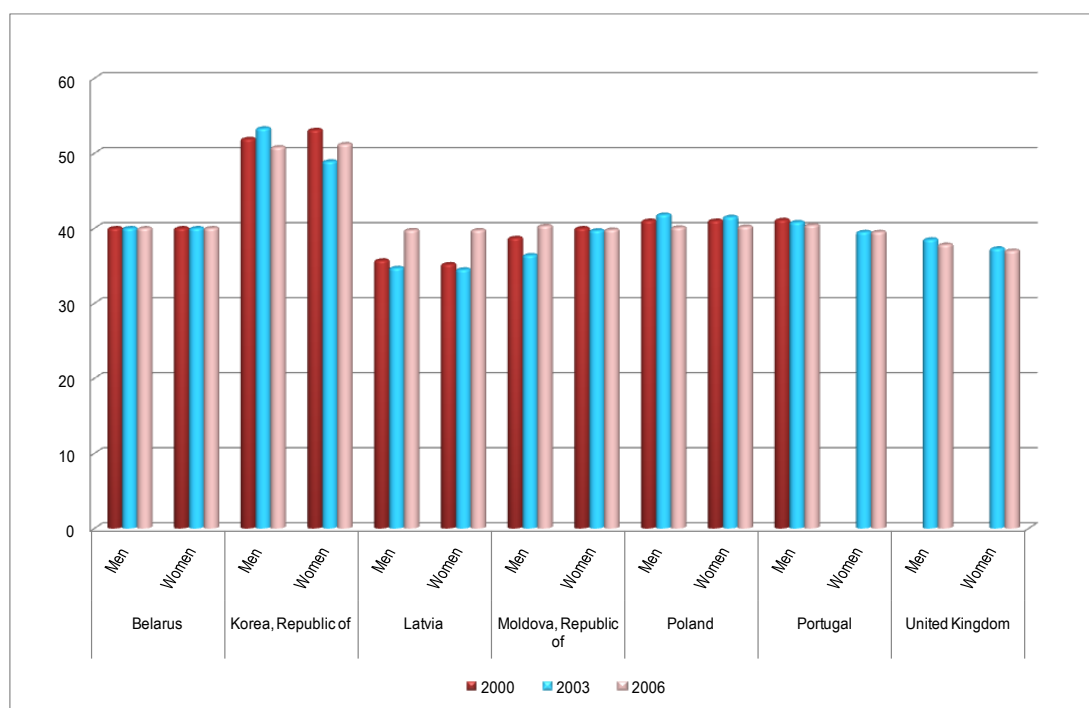
Source: ILO: Laborsta.

Figure 3.24. Average weekly hours of work, by gender, in the manufacture of industrial chemicals, selected countries – chemistry technicians



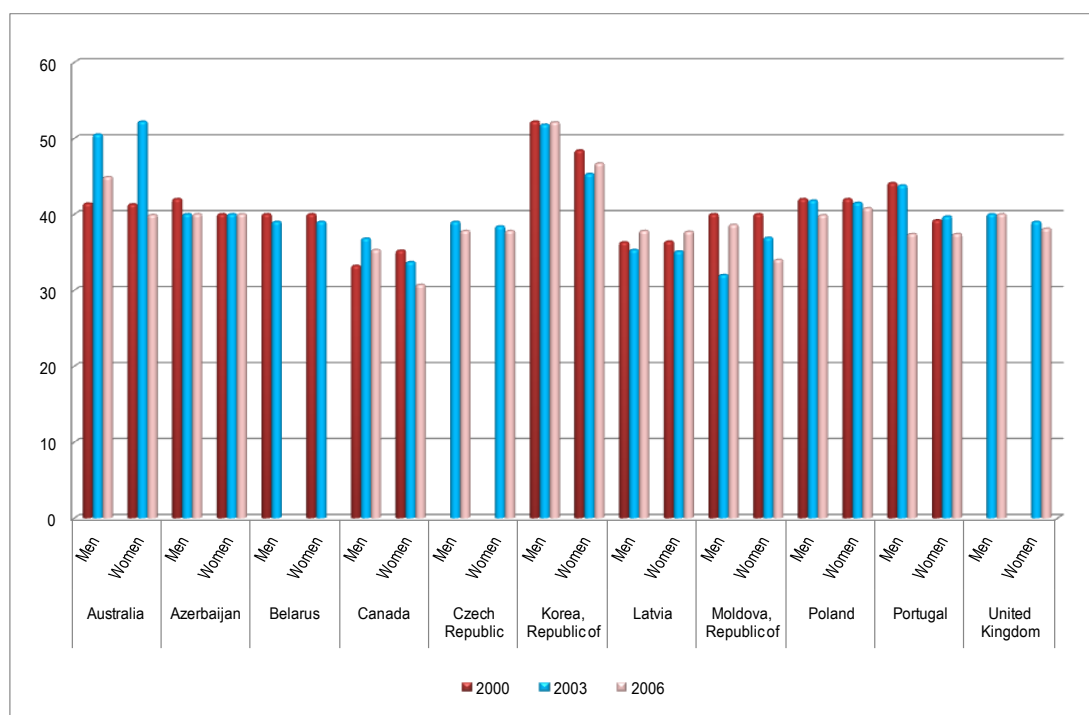
Source: ILO: Laborsta.

Figure 3.25. Average weekly hours of work, by gender, in the manufacture of industrial chemicals, selected countries – supervisors or general foremen



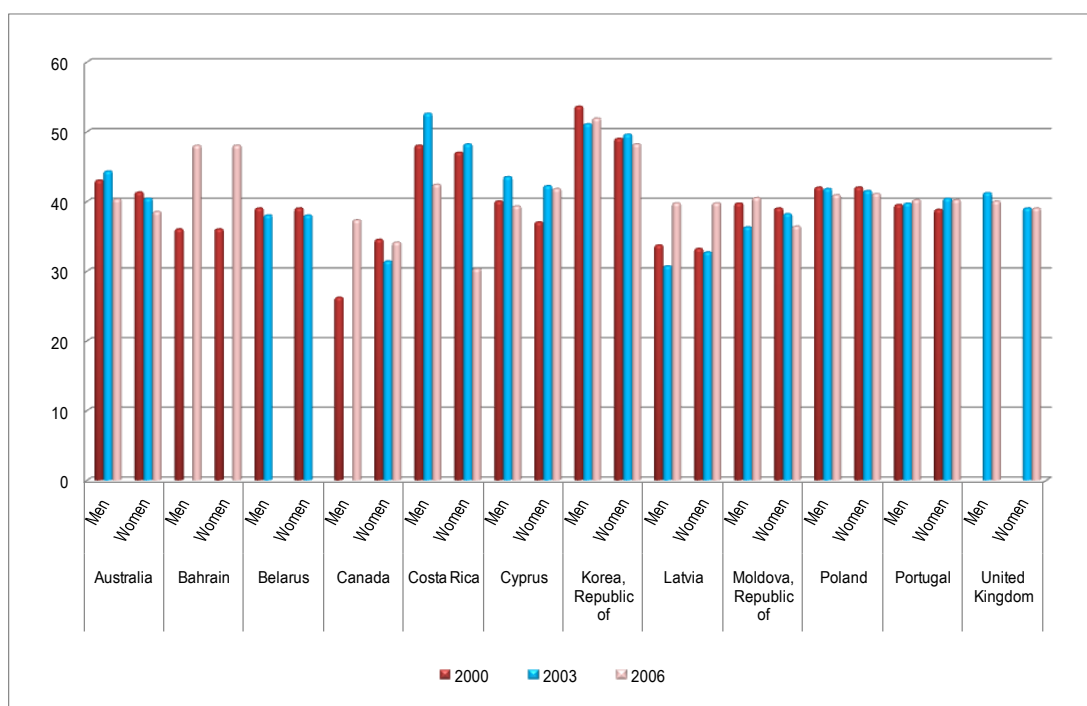
Source: ILO: Laborsta.

Figure 3.26. Average weekly hours of work, by gender, in the manufacture of industrial chemicals, selected countries – mixing- and blending-machine operators



Source: ILO: Laborsta.

Figure 3.27. Average weekly hours of work, by gender, in the manufacture of industrial chemicals, selected countries – labourers



Source: ILO: Laborsta.

3.3.1. Working-time arrangements and family-friendly initiatives

111. Economic situations sometimes oblige the chemical industry to choose flexible working-time arrangements. KIPLAS pointed out that in Turkey demands for flexible working-time arrangements mostly came from employers.²⁰ The collective labour agreement in the chemical industry in Switzerland allows companies to arrange for employees' weekly working time to exceed a daily maximum of eight hours, provided that their annual working time does not exceed 1,982 hours. Similarly, firms can operate flexibly to limit weekly working time, provided that annual working time is not exceeded. The collective labour agreement also enables each chemical company to regulate shift-working time.²¹
112. Restructuring can be an opportunity for the chemical industry to adopt flexible working-time arrangements that contribute to making the workplace more responsive to the needs of workers with family responsibilities, whether in respect of their children, their parents, or others who require their care. These measures have contributed towards the reconciliation of work and family life, while at the same time increasing productivity and expanding equal opportunity.

²⁰ Information provided to the ILO by KIPLAS.

²¹ Collective Agreement for Basel Pharmaceutical, Chemical and Service Industries, effective 1 January 2002.

4. The implications of restructuring for industrial relations

- 113.** The issues relating to the impact of restructuring on industrial relations deserve our attention, because without good employer–employee relationships, restructuring is not always successful. Celerant Consulting found that the history of M&A in the chemical industry does not have a great track record, with over half of recent transactions held to have destroyed value rather than creating it. It is suggested that chemical companies must choose carefully whether to acquire or to ally, and to be clear about their objectives for doing so, and then to implement an action plan to deliver the benefits in a timely way.¹ Poorly managed M&A can harm companies by losing talented workers from the company when it is restructured. It should be noted that choosing M&A does not necessarily help chemical companies to attain their goal. On the contrary, excessive downsizing of manpower can harm a company’s growth, because losing workers with expertise and knowledge weakens the base for growth. Thus, industrial relations’ issues play a vital role in restructuring. This chapter will discuss the implications of restructuring for employer–employee relationships in the chemical industry.

4.1. Overcoming the cultural differences

- 114.** Poorly managed M&A could lessen workers’ motivation. In any M&A transaction, it is important to consider, prior to merger, how different corporate cultures will amalgamate. The cultural differences between merging firms are a key element affecting the success of M&A. However, employers often pay less attention to differences in cultural elements, and do not analyse thoroughly the cultural fit of the merging entities, especially during pre-merger stages. In many cases, employers do not have a complete culture integration strategy or, where they do have it, it is often for either total cultural integration or total autonomy. If employers do not have coherent and proactive strategies for optimizing the benefits of amalgamating the two cultures or for dealing with cultural problems, any decision made will be at best tenuous and at times reactive with regard to solving culture-related issues. In short, cultural fit is a key factor in M&A success and should be given the necessary attention at all stages of M&A.
- 115.** Good pre-merger planning, with corporate culture at the heart of integration strategies and implementation, and the creation of a positive atmosphere for change, before initiating any actual consolidation of human and physical assets, contribute to M&A success and value creation. Communication plays a critical role in developing trust between the companies involved and consequently leading to successful integration. Lack of effective communication heightens cultural differences and may create tension between employees. In order to reduce communication issues, employers are requested not only to give information but to actively involve all stakeholders, and especially employees, in the merger process. The implementation of job rotation systems, whereby key players exchange jobs and/or work together with their counterparts in the merging company, helps to familiarize them with what goes on and how things are done in each company. Culture integration should be an active and gradual process in which the two firms learn to work and do things in the same way, or understand why they should do things differently. During this stage of the process, it is important to focus on the levels of integration between the two cultures and the creation of an atmosphere that can support cultural

¹ S. Smith: “Working on growth”, in *European Chemical News* (Wageningen), 24–30 Jan. 2005, pp. 20–22.

change. In order to create that atmosphere, firms should be willing to work together after the merger, something that can only be achieved with socio-cultural integration and communication between the two organizations' employees. In the post-merger phase, chemical companies must maintain that atmosphere and also introduce processes and systems to measure and evaluate the effectiveness of the new organizational culture to the new organization's performance and to employees' morale, and they must respond accordingly.²

4.2. Outsourcing and contract labour

- 116.** Outsourcing enables chemical firms to access high-quality services in a cost-effective way. In Japan, nine major chemical companies stated, regarding the impact of restructuring on work methods, that they had expanded the use of outsourcing.³
- 117.** It should be noted that outsourcing can have adverse effects on industrial relations. The terms of employment contracts are becoming increasingly diverse. Restructuring companies and value chains contribute to the fragmentation of industrial relations. The coexistence of various employment conditions driven by value-chain restructuring has resulted in a weakening of traditional industrial relations. This becomes even more apparent in the context of growing differences between core and peripheral, or internal and external, workers. The traditional view was that segmenting workforces on the flexible firm model, for example, served to buffer core workers and left peripheral workers with all the disadvantages and risks of cost-cutting and flexibility, among other things, through outsourcing or contracting. However, this no longer seems to apply for core workers. Core workers are now bearing more and more of the effects of flexibility. Value-chain restructuring rarely has the effect of cushioning core workers; instead, they are now subject to greater pressures for flexibility and work intensification. Globalization has increased competition, and this, in turn, has increased competition among all types of workers within the same company. This has led to an increased fragmentation of industrial relations in the workplace.⁴
- 118.** Particularly in recent years, outsourcing and contract labour have become one of the issues central to industrial relations in the chemical industry. Unions have noted increasingly diverse types of contracts in recent years. The traditional and straightforward contracting-out of jobs onsite and/or outsourcing offsite is moving towards more specialized and sophisticated contracting. In the petrochemical sector, the number of specialist service providers has been increasing. A principal company can "buy" services that it does not wish to maintain in-house. Many ICEM affiliates have stated that these specialist contractors are not a problem, because they are established companies whose contracts with the principal company last for many years. They often employ skilled staff on a long-term basis, with relatively decent terms and conditions. However, unions have found a problem with a new breed of "service suppliers"; and a wide range of services that were

² G. Lodorfos and A. Boateng: "The role of culture in the merger and acquisition process: Evidence from the European chemical industry", in *Management Decision* (Bingley, Emerald Group Publishing Limited), Vol. 44, No. 10, 2006, pp. 1405–1421.

³ Information provided to the ILO by Nippon Keidanren.

⁴ J. Flecker: "Fragmenting labour: Organisational restructuring, employment relations and the dynamics of national regulatory frameworks", in *Work Organisation, Labour and Globalisation* (London, Analytica Publications Ltd), Vol. 4, No. 1, 2010, pp. 8–23.

once an integral part of a big firm are now being contracted to service suppliers.⁵ A recent trade union survey showed an increase in the number of workers employed on precarious contracts. A total of 66 per cent of ICEM and International Metalworkers' Federation (IMF) affiliates that participated in the survey indicated that there had been an increase in temporary or part-time work in the chemicals and metal industries in their countries in 2009. Only 22 per cent of their affiliates reported that they had seen a decrease, with a further 12 per cent stating that there had been no change.⁶

- 119.** There has been a growing emergence of so-called “more flexible forms of work”, which deviate from standard employment contracts. Non-standard work can be further divided into “atypical” and “very atypical” forms of work. The latter refers to very short fixed-term contracts of less than six months’ duration, part-time work of fewer than ten hours per week, non-written contracts, and zero-hours or on-call working. A study examined the phenomenon of very atypical work, looking at the incidence and nature of this form of work across the 27 Member States of the European Union, and Norway. The study found that while the incidence of non-standard forms of work was thought to be increasing, a high degree of variety was evident across Europe in the use of each type of very atypical contract. The types of workers engaged in very atypical forms of work tended to be extremely varied, ranging from very low-skilled workers on seasonal contracts to highly-skilled professionals on short, task-focused contracts; clearly, the work situation of these two categories differs radically. One of the effects of the global economic crisis is a growing population of unemployed, highly skilled professional contractors. As a result, pharmaceutical firms make more use of contractors in all discovery-based disciplines than they previously did, so that firms can gain flexibility to fill a short-term need.⁷
- 120.** With regard to quality of work, non-standard and very atypical workers face particular challenges. For example, these workers feel they have less job security, lack a fixed career plan, receive fewer training and career development opportunities, and experience greater difficulties in reconciling working and non-working life as a result of the characteristics of atypical work. Non-standard forms of employment tend to be associated with lower rates of pay, as many workers in this category work in relatively low-skilled jobs. Such forms of work may also have negative repercussions on the receipt of bonuses or on workers’ social security coverage and entitlements. With regard to occupational safety and health, workers on very atypical contracts tend to work in more hazardous jobs or have more hazardous working conditions than their counterparts on more standard contracts. In some countries in Europe, the risk of work-related accidents and injuries appears to be higher for particular types of non-standard workers, such as those on fixed-term contracts. Moreover, the study found that the specific features of very atypical contractual arrangements could have an adverse impact on workers’ health.⁸
- 121.** Chemical trade unions have appealed for industrial action to secure workers’ rights at work for these vulnerable workers. Some recent actions by chemical workers regarding contract

⁵ C. Mather: *Contract/Agency labour: A threat to our social standards* (Geneva, ICEM, 2004).

⁶ A. Gardner: “ICEM/IMF survey shows precarious work still growing”, International Metalworkers’ Federation press release, 10 Feb. 2010 (Geneva).

⁷ S. Ainsworth: “Cautiously optimistic”, in *C&EN* (Washington, DC, American Chemical Society), 1 Nov. 2010, pp. 38–42.

⁸ Foundation for the Improvement of Living and Working Conditions (Eurofound): *Flexible forms of work: “Very atypical” contractual arrangements: Executive summary* (Dublin, European Working Conditions Observatory (EWCO), 2010).

and agency labour issues included the following: in November 2005, about 1,000 Thai chemical workers protested against amendments to the Labour Protection Act of 1998, which created a mass of contract workers who had no rights and no direct employer–employee relationship with the actual companies for which they worked;⁹ some 2,500 workers at DSM in the Netherlands marched to protest the company’s decision to cut 1,000 core workers at industrial chemical worksites in Geleen and replace them with 500 contractors;¹⁰ and in the Republic of Korea, chemical workers took part in a general strike to protest their Government’s labour law reform granting more flexibility to employers to use temporary workers and contract labour.¹¹ Earlier, in April 2005, workers at Kemalex Plastics in Australia went on strike over the rights of contract labour.¹² More recently, in January 2011 in Bangladesh, a worker at Advanced Chemical Industries Ltd (ACI) lost his life and many were hospitalized as a result of demonstrations against the fact that some of their members had been on temporary employment contracts for as long as 12 years.¹³

- 122.** Examples in the chemical industry show that collective bargaining can be a useful tool to address issues on outsourcing and contract labour, although collective bargaining is generally still limited in its reach and scope. The social partners in the German chemical industry chose to allow the use of an employment service agency, to an extent protecting existing jobs in the industry. Economic stagnation in Germany motivated the German Federation of Chemical Employers’ Associations (BAVC) and IG BCE to agree on a framework for allowing wider use of private agency workers. The agreement allows the use of agency workers through the creation of personnel service agencies (PSAs) in line with the modern services on the labour market.¹⁴ PSAs are less costly, as employers do not have to pay the usual social costs and benefits. Although they have to take account of the collective labour agreements that govern the German chemical sector, PSAs have the flexibility to negotiate on a company-by-company basis. This means that they do not have to follow the collective agreements slavishly. PSAs are able to offer short-term, temporary contracts without the usual employment conditions granted to German workers in permanent work.¹⁵ In Brazil, an agreement has been reached between BASF and chemical workers at the Guaratinguetá plant – one of the largest BASF plants operating in Latin America. About 50 per cent of workers at the plant are non-regular workers. The agreement aims to regulate the use of contract and agency labour and requires the company to pay the same wages and benefits to agency workers as it pays to regular employees. Failure to implement the agreement will result in a fine of BRL500 (US\$100) per worker

⁹ ICEM: “Thai workers protest to Government on contract and agency labour”, ICEM InBrief, 28 Nov. 2005 (Geneva).

¹⁰ ICEM: “DSM Dutch workers protest outsourcing”, ICEM News release No. 15/2004, 15 Mar. 2004 (Geneva).

¹¹ ICEM: “Fate of South Korea’s irregular Workers’ Bill coming due”, ICEM InBrief, 28 Nov. 2005 (Geneva).

¹² ICEM: “Kemalex Plastics strike in Australia ends”, ICEM InBrief, 11 July 2005 (Geneva).

¹³ ICEM: “ICEM condemns ACI conduct in deadly Bangladesh chemical plant riot”, ICEM News release, 26 Jan. 2011 (Geneva).

¹⁴ “New law passed on temporary agency work” (Dublin, European Foundation for the Improvement of Living and Working Conditions, 2002).

¹⁵ “Unions u-turn on agency staff use”, in *ICIS Chemical Business* (Sutton, Surrey), 31 Mar. 2003, p. 9.

per day.¹⁶ These facts suggest that consultation is also important in order to secure regular employment for a group of vulnerable workers. Collective labour agreements to establish workers' rights to decide jointly with management whether to subcontract and to whom, and union participation and support, through involvement in consultation and the decision-making process, are necessary to ensure the protection of workers, including those in precarious employment.

4.3. Collective bargaining in times of restructuring

- 123.** As will be discussed in Chapter 5, the exchange of information is the most basic process of social dialogue. Social dialogue can sometimes imply no real discussion or action on the issues concerned, but it is an essential starting point towards better industrial relations. Consultation is a means by which the social partners not only share information but also engage in more in-depth dialogue on the issues raised. Because consultation itself does not carry with it any decision-making power, collective bargaining becomes important for initiating dialogue between the parties concerned in the case of contingencies, including restructuring, takeovers and M&A.
- 124.** Collective labour agreements, ultimately, are promises between employers and workers, and as such should be fully respected. Some collective labour agreements in the chemical industry incorporate a provision stating that in case of a contingency problem affecting the workers and company financial matters, the company is to inform trade unions of such plans and implications for employees' conditions of work. A collective labour agreement in the chemical industry in Switzerland, signed in January 2002, incorporates the unions' right to be given information. Article 26 of the collective labour agreement gives trade unions the right to organize workers' meetings to discuss emergency matters among trade union members, without employers' intervention.¹⁷
- 125.** In Latin America, the role of collective bargaining has become more significant in recent years than in the past. For example, in Argentina and Brazil, bargaining has instituted workers' rights at work other than those provided by the industrial relations legal framework, and in Brazil and Mexico many aspects concerning workers' issues are now bargained. PEMEX underwent a modernization programme during the period 1990–94. It initiated negotiations with trade unions in accordance with a provision of the collective agreement. The parties negotiated general and specific conditions for the workers affected by the issues listed in the collective labour agreement.¹⁸ In Brazil, collective bargaining has traditionally focused on wage bargaining; most non-wage issues involved either extensions to, or replications of, provisions decided by the Consolidation of Labour Laws. At enterprise level, firms and trade unions negotiated a share of profits and results agreement to set out the minimum wage increase irrespective of productivity. During the recession, local government, companies and trade unions negotiated to reduce taxes and support the creation of a local productive agreement in the plastics sector of the

¹⁶ ICEM: "Brazilian social partners agree on CAL regulation at BASF", ICEM Background document, 15 Sep. 2010 (Geneva).

¹⁷ Collective agreement for Basel Pharmaceutical, Chemical and Service Industries, effective 1 January 2002.

¹⁸ Information provided to the ILO by Petróleos Mexicanos.

petrochemical industry in São Paulo's ABC region.¹⁹ Trade unions in the oil and chemical industries managed to create additional individual and collective rights, leading other sectors to include new rights in the collective labour agreements. As a result, recent collective labour agreements have included provisions for maintaining jobs or increasing numbers of jobs, such as: a guarantee of employment levels during a particular period; the reduction of working hours to secure jobs temporarily; the elimination of overtime; and job security during restructuring as a result of new technologies.²⁰

- 126.** Flexibility in sectoral collective bargaining can be observed in the chemical industry in some European countries, such as Austria, Italy and Germany. The German chemical industry has developed flexibility in sectoral collective agreements. The BAVC and IG BCE stated that bargaining parties in chemicals were a good example in that respect, demonstrating that it was possible to maintain the system of firmly established sectoral collective labour agreements while at the same time meeting the demands of companies for increased flexibility. In the German chemical industry, three major "opening clauses" were introduced into chemical industry agreements. In 1994, there was the introduction of a working-time corridor, which allowed companies either to extend or shorten the collectively agreed working time of 37.5 hours per week by up to 2.5 hours. As a result, there was a working-time corridor of between 35 and 40 hours per week. In 1995, the BAVC and IG BCE agreed on the introduction of an opening clause for the agreed annual bonuses. And, in 1997, a wage corridor was introduced which, under certain circumstances, allowed companies to reduce collectively agreed pay by up to 10 per cent for a limited period of time (box 4.1). In March 2011, the German chemical industry concluded a new agreement that includes, inter alia, a clause to allow company-level agreements to either bring forward pay increases by one month, or to postpone them for up to two months, depending on the economic situation of the country.²¹
- 127.** While greater flexibility in sectoral agreements can respond to the greater diversity of individual company circumstances in the chemical industry, it must be noted that opening clauses have changed the basic structure of sectoral collective bargaining. The widespread introduction of these clauses has triggered a process of decentralization that has shifted an increasingly large part of bargaining responsibilities to the company level. This has resulted in a significant loss of regulatory power on the part of both employer associations and trade unions. Collectively agreed standards, once seen as formal inviolable norms, have now become objects of renegotiation at company level, with varying degrees of involvement by the signatories to the sectoral agreements. As a result, trade unions have to engage much more directly with the needs and requirements of companies, and works councils have less scope to take refuge in the mandatory character of sectoral regulations when confronted by management calls for local concessions. This requires more

¹⁹ ILO: *Restructuring and social dialogue in the chemical industry in Brazil*, Sectoral Activities Working Paper (Geneva, forthcoming).

²⁰ A. Cardoso and J. Gindin: *Industrial relations and collective bargaining: Argentina, Brazil and Mexico compared*, Industrial and Employment Relations Department, Working Paper No. 5 (Geneva, ILO, 2009).

²¹ Information provided to the ILO by the BAVC.

coordinating efforts from the unions in order to avoid a decline in standards within the sectors.²²

Box 4.1

“Opening clauses” in the German chemical industry

- Working-time corridor of +/- 2.5 hours relative to the standard agreed working week of 37.5 hours.
- Reduction of wages/salaries by 10 per cent in the event of economic difficulties to safeguard jobs and/or improve competitiveness.
- Lower pay rates for newly hired employees in their first job, or previously long-term unemployed people: 90–95 per cent.
- Annual bonus: scope for variation between 80–125 per cent of a month's pay, instead of a fixed amount of 95 per cent.
- Annual bonus, holiday allowance, capital formation payment: scope for deviation from agreed stipulations on both the amount and/or the date of payment in the event of serious economic difficulties.

4.4. Termination of employment

128. The Termination of Employment Convention, 1982 (No. 158), stipulates that there must be a valid reason for termination of employment connected with the capacity or conduct of the worker or based on the operational requirements of the undertaking, establishment or service (Article 4). The provisions of the Convention relate to the period of notice of termination, the procedure of appeal against termination, severance allowance and other income protection. There are supplementary provisions concerning termination of employment for economic, technological, structural or similar reasons, in which employee participation plays an essential role. For example, Article 13 of the Convention states that:

- (1) When the employer contemplates terminations for reasons of an economic, technological, structural or similar nature, the employer shall:
 - (a) provide the workers' representatives concerned in good time with relevant information including the reasons for the terminations contemplated, the number and categories of workers likely to be affected and the period over which the terminations are intended to be carried out;
 - (b) give, in accordance with national law and practice, the workers' representatives concerned, as early as possible, an opportunity for consultation on measures to be taken to avert or to minimise the terminations and measures to mitigate the adverse effects of any terminations on the workers concerned such as finding alternative employment (Article 13(1)).

129. The Termination of Employment Recommendation, 1982 (No. 166), calls for member States to take measures with a view to averting or minimizing terminations, and to mitigating the adverse effects of terminations on the workers concerned (e.g. restriction of hiring, spreading the workforce reduction over a certain period of time to permit natural reduction of the workforce, internal transfers, training and retraining, voluntary early retirement with appropriate income protection, restriction of overtime and reduction of normal hours of work) (Paragraph 21). Where it is considered that a temporary reduction of normal hours of work would be likely to avert or minimize terminations of employment due to temporary economic difficulties, consideration should be given to partial

²² R. Bispinck and T. Schulten: *Sector-level bargaining and possibilities for deviations at company level: Germany* (Dublin, European Foundation for the Improvement of Living and Working Conditions, 2011).

compensation for loss of wages for the normal hours not worked, financed by methods appropriate under national law and practice (Paragraph 22).

- 130.** It should be noted that the employer is required by Convention No. 158 to notify the competent public authorities when it contemplates the termination of workers' employment for reasons of an economic, technological, structural or similar nature. The public authorities should receive all other relevant information, including a written statement of the reasons for the terminations, the number and categories of workers likely to be affected and the period over which the terminations are intended to be carried out. Moreover, the employer should notify the competent public authority of the terminations before carrying them out, and the period of notice should be specified in national laws or regulations.
- 131.** In China, the Government plays a crucial role in the restructuring of the chemical industry, because of the importance of the industry to the national economy. The Government actively promotes restructuring in order to stimulate the industry. For example, in 2005, Yunnan Province conducted the restructuring of Yuntianhua Group Co. Ltd, Yunnan Petroleum and Chemical Group, Yunnan Dongyuan Coal Industry Group Co. Ltd, Yunnan Tin Group Co. Ltd, Kunming Institute of Precious Metals, and two other companies, finally forming Yunnan Coal Chemical Industry Group Co. Ltd, to achieve optimal allocation of resources. The Government respected the principle of "no layoffs, no pay cuts" in the restructuring processes.²³
- 132.** In Brazil, labour law neither determines nor stipulates prior communication and negotiation on the impact of restructuring. The employer is responsible only for communication, with 30 days' prior notice, of termination of the employment relationship without determined cause. This period shall be paid and the employee may or may not – at the discretion of the employer – work the period. If the period is worked, the employee can have a two-hour reduction in hours of work per day to look for a new job. Most of the time, the employee is exempt from working out this period of notice, receiving, inter alia, as well as 30 days' salary, indemnification corresponding to the balance of wages, vacation, past dues or a percentage thereof; 40 per cent of the total balance of the employee's severance guarantee fund as a penalty to the employer; a percentage of the 13th salary (Christmas allowance); pending overtime, prizes and bonuses. Some labour court decisions have hindered unfair collective dismissal, when arising from corporate restructuring, on the grounds of ILO Convention No. 158.²⁴
- 133.** In Japan, nine major chemical companies set out a basic rule not to lay off employees. When alternative jobs within the company could not be found, employees were offered alternative employment opportunities in its subsidiaries. If they could not accept the alternative employment offered by the company, they had to leave. This raised the question of how the company ensured fairness throughout the process. One company said that it respected the decisions of the individual employees on taking early retirement or accepting the transfer to related companies. Other companies said that fairness could be retained through sincerity and good faith, and that they dedicated sufficient time and the utmost effort to consultation with trade unions and the employees affected. In this context, companies also provided the workers affected with comprehensive individual consultations. When the employees affected chose to leave, the company expressed its

²³ ILO: *Restructuring and social dialogue in the chemical industry in China*, Sectoral Activities Working Paper (Geneva, forthcoming).

²⁴ ILO: *Restructuring and social dialogue in the chemical industry in Brazil*, Sectoral Activities Working Paper (Geneva, forthcoming).

sincerity by maximizing their monetary compensation. One company added 36 months' pay to the retirement allowance. Companies also used outside job placement services.²⁵

- 134.** Transparency and fairness with regard to termination of employment must be applied. According to BASF, German labour law, under certain circumstances, requires negotiations to compensate, or at least reduce, negative impacts on employees as a result of restructuring. The usual results of such negotiations are certain conditions on severance payments, in order to compensate for job losses. At BASF, the company and trade unions have concluded a new site agreement that prevents dismissal as a result of company operational activities. This agreement will enable the parties to better deal with the relocation of surplus workers within the company.²⁶

²⁵ Information provided to the ILO by Nippon Keidanren.

²⁶ Information provided to the ILO by BASF SE.

5. Social dialogue in times of restructuring

5.1. The role of social dialogue

- 135.** The ILO has a broad working definition of social dialogue, reflecting the wide range of processes and practices found in different countries. Social dialogue is defined by the ILO to include all types of negotiation, consultation or simply exchange of information between, or among, representatives of governments, employers and workers, on issues of common interest relating to economic and social policy. It can exist as a tripartite process, with the government as an official party to the dialogue or it may consist of bipartite relations only between labour and management (or trade unions and employers' organizations), with or without indirect government involvement. Social dialogue processes can be informal or institutionalized, and are often a combination of the two. Social dialogue can take place at the national, regional or enterprise levels. It can be inter-professional, sectoral or a combination of these. The main goal of social dialogue itself is to promote consensus building and democratic involvement among the main stakeholders in the world of work. Successful social dialogue structures and processes have the potential to resolve important economic and social issues, encourage good governance, advance social and industrial peace and stability, and boost economic progress.¹ The chemical industry knows that social dialogue can increase profits by leading to greater productivity and enhanced worker satisfaction.²
- 136.** The chemical industry has expanded the functions of social dialogue. ICEM has shown that social dialogue was useful in establishing social justice and stability in Colombia, for example. ICEM and its affiliates obtained the commitment of several multinational chemical and energy companies and the Government of Colombia to engage in social dialogue and make improvements in three major areas: HIV/AIDS, contract labour and the massive security problems faced by trade unions in Colombia.³
- 137.** Social dialogue plays a pivotal role in promoting fundamental rights at work. In the chemical industry in Brazil, social dialogue is considered a process in which social, economic or political actors seek convergence of goals or negotiate matters of common interest. Social dialogue can result in shared agreements and projects and can strengthen the democratic governance and sustainability of the institutions involved. It can contribute to fostering democracy in the workplace, especially the rights of workers and their representative organizations. Social dialogue is an ongoing process.⁴
- 138.** Informal dialogue can lead to a formal dialogue mechanism. In 2001, in South Africa, the National Bargaining Council for the Chemical Industry (NBCCI) was approved as an official bargaining unit under the country's Labour Relations Act of 1995. NBCCI's history began in 1995, in a dispute between the Chemical Workers' Industrial Union and

¹ <http://www.ilo.org/public/english/dialogue/ifpdial/areas/social.htm> [accessed 20 Mar. 2011].

² National Safety Council of India (NSCI): *Vocational education and training in the chemical industry in India*, Sectoral Activities Working Paper No. 244 (Geneva, ILO, 2006), p. 29.

³ ICEM: "Union/Management social dialogue in Colombia on track", ICEM News release No. 16/2005, 6 July 2005 (Geneva).

⁴ ILO: *Restructuring and social dialogue in the chemical industry in Brazil*, Sectoral Activities Working Paper (Geneva, forthcoming).

chemical firms. The dispute was resolved through conciliation, which led to the development of social dialogue between employers and employees; the parties subsequently agreed to engage in sectoral bargaining and establish appropriate bargaining forums in various economic sectors of the chemical industry. A social dialogue mechanism was created in the form of a representative national working group, with interim arrangements to facilitate informal sectoral dialogue until the statutory bargaining council was established. NBCCI covers oil, chemicals, consumer goods, glass, industrial chemicals and pharmaceutical sectors. Its primary aim is to provide a vehicle for dialogue between employers and workers in South Africa's chemical and petroleum industries, with a view to improving industrial relations, and to provide the social partners with new approaches to industrial relations. Employers and workers can now obtain a better overall picture in order to contribute to sustainable economic growth. NBCCI also contributes to minimizing tensions between the parties concerned.⁵

139. In the European Union, social dialogue encompasses discussions, joint action and sometimes negotiations between the European social partners, and discussions between the social partners and the institutions of the European Union. Article 138 of the European Union Treaty (as amended by the Single European Act) requires the European Commission to develop social dialogue within the European Union.⁶ In 1998, the European Commission decided to revitalize social dialogue by establishing sectoral social dialogue committees. In doing so, the Commission aimed to specify more clearly the double function of such committees: to act as consultative bodies able to influence European public policies, and to work to develop bilateral relations and reach agreement. Currently, there are 36 sectoral social dialogue committees, including one for the chemical industry.⁷ In 2004, the social partners in the European chemical industry agreed the *Joint Position Paper on education, vocational training and lifelong learning in the European chemical industry*, called the Helsinki Joint Position Paper. This drew attention to the high proportion of knowledge-based workplaces, the need for highly trained staff, particularly in the chemical industry, the lack of skills, and future demands for qualifications of workers in the chemical industry. It affirmed that “one of the key tasks for the public institutions in the individual member countries” was “to secure a high level of general education for all citizens as well as an open and fair approach of this education towards natural sciences, technology in general, a basic understanding of economic developments and good standards in communication skills”, and that vocational training, regular and “appropriate further training and lifelong learning over the entire working life is essential not only for companies” to be “successful, productive and efficient, but also for each employee in order to maintain his or her employability”.⁸

140. Social dialogue has been tested during the global economic crisis. Tensions between the social partners in the chemical industry have been visible in some countries, whereas smoother cooperation and joint agreements have been put into practice in others. During the crisis, two developments in social dialogue were highlighted. First, there is a growing risk that economic hardship increases tensions between the social partners, because they

⁵ S. Miller and T. van Meelis: *Industrial relations in the oil industry in South Africa*, Sectoral Activities Working Paper No. 238 (Geneva, ILO, 2006), pp. 39–40.

⁶ http://eur-lex.europa.eu/en/treaties/dat/12002E/pdf/12002E_EN.pdf [accessed 20 Mar. 2011].

⁷ European Foundation for the Improvement of Living and Working Conditions: *Dynamics of European sectoral social dialogue* (Dublin, 2009), pp. 15–16.

⁸ EMCEF and ECEG: *Skills for chemical businesses: Understanding society needs*, Report based on a survey of the social partners of the European chemical industry (2006).

have to cope with redundancies and downsizing in enterprises. Second, employers are keen to see measures aimed at a more flexible labour market that enables them to adjust to the economic context in a timely fashion. The crisis also underscores the importance of tripartism, because during the crisis, the social partners worked together to encourage governments to take measures to mitigate the crisis.⁹

5.2. Why consultation is important

- 141.** Research suggests that employers do not provide workers and their representative organizations with adequate information during restructuring. Employees perform better when they know what is expected of them and feel they have opportunities to voice their opinions. Research confirms that organizations with communication infrastructures that allow for constant listening and feedback reap the rewards of that approach. A study¹⁰ makes clear links between robust communication processes and increased profits. The research shows that companies with the most effective employee communication programmes provided a 26 per cent total return to shareholders, compared to a minus 15 per cent return from organizations at the other end of the scale.¹¹
- 142.** In the European Union, forms of employee representation at the workplace have been legally established and institutionalized in most Member States. Directive 2002/14/EC establishing a general framework for informing and consulting employees in the European Community has been considered a landmark development in establishing common guidelines for employee representation and social dialogue in the workplace (box 5.1).

Box 5.1

Key features of Directive 2002/14/EC establishing a general framework for informing and consulting employees in the European Community

The purpose of the Directive is to establish a general framework setting out minimum requirements for the right of employees to be informed and consulted. The Directive is drafted in broad terms and allows Member States considerable flexibility in implementing its terms. However, the following points are defined as being crucial to the framework regulation:

- (1) Member States have to choose whether to apply the Directive to undertakings with at least 50 employees or establishments employing at least 20 employees.
- (2) Information and consultation are defined as taking place between the employer and employee representatives. The Directive requires:
 - (a) information on the recent and probable development of the undertaking's or the establishment's activities and economic situation;
 - (b) information and consultation on the situation, structure and probable development of employment, and on any anticipatory measures envisaged, in particular where there is a threat to employment;
 - (c) information and consultation, with a view to reaching an agreement, on decisions likely to lead to substantial changes in work organization or in contractual relations.
- (3) Information and consultation arrangements defined by agreements between management and labour,

⁹ European Foundation for the Improvement of Living and Working Conditions: *Social dialogue and the recession* (Dublin, 2009).

¹⁰ J. Waddington: "Contesting the development of European Works Councils in the chemicals sector", in *European Journal of Industrial Relations* (Thousand Oaks, CA, SAGE Publications), Vol. 12, No. 3, 2006, pp. 329–352.

¹¹ D. Ferrabee: "Developing an employee consultation process", *Strategic Communication Management*; Dec. 2004–Jan. 2005; 9, 1; ABI/INFORM Global, p. 31.

including at undertaking or establishment level, may differ from those set out by the Directive.

- (4) Employers may require employee representatives to treat information as confidential, and need not inform or consult where to do so would seriously harm or prejudice the undertaking or establishment.

Although time schedules differed according to company size and country, the Directive had to be implemented before March 2008 in all Member States.

Source: http://eur-lex.europa.eu/smartapi/cgi/sga_doc?smartapi!celexapi!prod!CELEXnumdoc&lg=EN&numdoc=32002L0014&model=guichett [accessed 20 Mar. 2011].

143. The Directive also specifies a range of issues relating to company performance and plans on which the European Works Councils (EWCs) might be informed and consultation take place. The standing orders of the EWCs established within the chemical companies operating in the European Union, which should appear on the agenda of each meeting of the EWC, are shown in table 5.1. In this table, “useful information” means information appearing in a form, usually in writing, and at a time appropriate for it to be assessed and for a considered response to be provided. The abovementioned study included some 30 chemical companies operating in the European Union in 2005. Although a wide range of the information appears to be presented to workers’ representatives at the EWCs, there is no single issue on which more than 40 per cent of the workers’ representative organizations at the EWCs report that useful information was provided and that they were consulted. For the most important issues for workers, such as plant closures or cutbacks, only 40 per cent out of the overall chemical EWCs reported that useful information was given to workers’ representatives. M&A information was provided and discussed by only 23.2 per cent of EWCs. In addition, in a significant number of cases, items on the standing orders did not even appear on the agenda. For example, more than 30 per cent of EWC representatives reported that changes to working methods, new technology policy, reorganization of production lines, employment forecasts, and R&D policy had not been raised at the EWCs in the chemical industry.

Table 5.1. Was the quality of the information and consultation adequate at the European Works Councils in the chemical industry? (percentage)

	Not raised	Raised, but useless information	Useful information, but no consultation	Useful information and consultation
Economic and financial situation of the company	3.6	4.4	62.0	30.0
Corporate strategy and investment	2.8	4.0	57.7	35.5
Changes to working methods	48.6	12.0	25.3	14.1
Closures or cutbacks	11.2	7.6	41.2	40.0
Mergers, takeovers or acquisitions	8.8	7.2	60.8	23.2
New technology policy	37.4	12.2	37.4	13.0
Reorganization of production lines	41.4	7.4	37.7	13.4
Transfers/relocation of production	19.8	8.9	47.5	23.8
Employment forecasts	31.2	10.5	42.9	15.4
Research and development policy	35.8	10.6	42.6	11.0

Source: J. Waddington: “Contesting the development of European Works Councils in the chemical sector”, in *European Journal of Industrial Relations* (Thousand Oaks, CA, SAGE Publications), Vol. 12, No. 3, 2006, p. 336.

144. ILO Recommendations Nos 94 and 129 request companies to consult with their workers’ representative organizations. The Co-operation at the Level of the Undertaking Recommendation, 1952 (No. 94), emphasizes that appropriate steps should be taken to promote consultation and cooperation between employers and workers at the level of the undertaking on matters of mutual concern, not within the scope of collective bargaining

machinery, or not normally dealt with by other machinery concerned with the determination of terms and conditions of employment (Paragraph 1). Recommendation No. 94 makes a clear distinction between the role of collective bargaining and that of consultation, emphasizing that consultation and cooperation should be facilitated within the enterprise by encouraging voluntary agreements between the parties, or by promoting laws and regulations regarding the establishment of consultation and cooperation bodies. These laws or regulations should also determine the scope, functions, structure and methods of operation for such bodies, as appropriate to national conditions. The Communications within the Undertaking Recommendation, 1967 (No. 129), reiterates that the method of communication between management and employees should in no way diminish the principle of freedom of association. In other words, communications policies should not cause prejudice to freely chosen workers' representatives or their organizations, or curtail the functions of the workers' representative bodies. This is important because, in practice, it is often difficult for workers' representatives to enforce their right to receive information, especially for collective bargaining purposes. Faced with this reality, Recommendation No. 129 introduces a set of principles that should guide both employers' and workers' representative organizations in establishing, implementing and maintaining effective communication policies.

- 145.** In Mexico, the law requires its state-owned oil and chemical company to consult with trade unions over any corporate structural change. PEMEX has a petrochemical business as a subsidiary – PEMEX Petroquímica (PPQ). Federal Labour Law (article 41) guarantees that industrial relations, in particular collective labour agreements, shall not be affected in the event of one employer being replaced by another. Article 9 of the Organic Law of PEMEX and its subsidiaries states that, in the event of any change in PEMEX's work organization and corporate structure, the employment and conditions of workers must be preserved as stipulated in the collective labour agreement. The Law mandates PEMEX to ensure that the trade union participates fully in the restructuring processes. It is understood that the Law implies that the existing collective agreement must be retained. The decree at the origin of PEMEX's present corporate structure states that one of the objectives of restructuring is to strictly enforce federal labour law and PEMEX's existing collective labour agreement to stabilize labour relations in the oil and chemical industries.¹²

5.3. When and how to consult

- 146.** The disclosure of information, and when and how to consult, are gaining importance. At the enterprise level, employers should, as far as possible, provide information on all matters of interest to workers in relation to the operation and future prospects of the enterprise, and to the present and future situation of the workers themselves. Such information should be addressed either to workers or to their representatives – taking into account the nature of the information, in so far as its disclosure, as stated in Recommendation No. 129, “will not cause damage to the parties” (Paragraph 15(1)). Recommendation No. 129 examines in more detail the kind of information that management should be able to communicate to workers and their representatives, for example: information on general conditions of employment, including engagement, transfer and termination; job descriptions and the placement of particular jobs within the structure of the undertaking; possibilities of training and prospects for advancement within the undertaking; general working conditions; occupational safety and health regulations and instructions for the prevention of accidents and occupational diseases; procedures for the examination of grievances as well as the rules and practices governing their operation

¹² C. Reynoso Castillo: *Industrial relations in the oil industry in Mexico*, Sectoral Activities Working Paper No. 239 (Geneva, ILO, 2005), p. 31.

and the conditions for having recourse to them; personnel welfare services, including medical care, health, canteens, housing, leisure, savings and banking facilities, etc.; social security or social assistance schemes in the enterprise; the regulations of national social security schemes to which the workers are subject by virtue of their employment in the enterprise; the general situation of the undertaking and prospects or plans for its future development; the explanation of decisions that are likely to affect directly or indirectly the situation of workers in the undertaking; and methods of consultation and discussion and of cooperation between management and its representatives on the one hand and the workers and their representatives on the other (Paragraph 15). Information provided to employees should make express reference to any issues that are the subject of a collective labour agreement concluded at a level beyond that of the enterprise.

- 147.** Generally, all information about the company and planned rationalization is immediately given to workers' representative organizations in the chemical industry. UBE Chemical Europe stated that a wide range of the information given to workers was beyond the legal requirements, and included company financial results, investments or any change in the corporate structure. Sharing valuable information with workers would have positive results, such as improved motivation.¹³ KIPLAS stated that Turkish chemical firms provided their workers with information on companies' competitiveness, general costs, benchmarking with other competitors, their market positions, the workforce cost, government trade policy and other factors affecting chemical businesses. Employees were also given information on companies' recent and future developments.¹⁴ BASF stated that the subject matter for consultation depended on specific cases and legal requirements. Generally, the subject matter included the situation, structure and probable development of employment, work organization, contractual relations, conditions of work, training and terms of potential severance packages.¹⁵ Boehringer Ingelheim Austria reported that the company held consultations with its employees on a variety of issues, because it believed that if they were well informed, employees and their representative organizations would show greater motivation for change.¹⁶ Atanor stated that it was flexible in selecting the subject matter and that in its experience the type of information it needed to provide workers with varied from time to time and from site to site.¹⁷ In Japan, disclosing a full range of information to trade unions, including to some degree insider and confidential information, made it easier for companies to move the entire processes of restructuring forward, because they were able to win the trust and confidence of trade unions and workers. Disclosing as much information as possible to trade unions allowed them and the employees to assess the possible impact of restructuring on employment and conditions of work. Full disclosure not only deepened workers' and trade unions' understanding of the development of the business and possible impact on the employees, but also contributed to strengthening the trust between the company and workers and trade unions in the long term. It also enabled the parties to make realistic judgments.¹⁸ Evonik Industries stated that ample and quality information allowed workers' representative organizations to

¹³ Information provided to the ILO by UBE Chemical Europe SA.

¹⁴ Information provided to the ILO by KIPLAS.

¹⁵ Information provided to the ILO by BASF SE.

¹⁶ Information provided to the ILO by Boehringer Ingelheim Austria.

¹⁷ Information provided to the ILO by Atanor SAC.

¹⁸ Information provided to the ILO by Nippon Keidanren.

formulate independent counter-proposals for the company.¹⁹ Solvay Ibérica stated that information on restructuring would also be given to contract and subcontract workers.²⁰

- 148.** When are chemical workers first informed? The timing of initial consultation varied from one company to another. At BASF, the timing of initial consultation and the frequency of consultation depended upon the quality and the level of the impact on employees. Generally, consultation with employees' representative organizations started before any announcement of corporate structural change to employees and the general public.²¹ Evonik Industries stated that the company organized initial consultations with workers' representative organizations before the company made a final business decision.²² Solvay Ibérica stated that the company would inform workers and their representative organizations of reorganization plans at the same time, and then consultations would normally take place with workers' representative organizations at the workplace.²³ Atanor said that consultations with workers and their representative organizations were conducted during and after the restructuring processes.²⁴
- 149.** How does consultation take place and who is involved? Borealis stated that it consulted with workers' representative organizations beyond the legal requirements.²⁵ KIPLAS stated that in Turkey, top managers or executive boards of chemical companies wishing to discuss restructuring would call workers' unions or their representatives at work at an appropriate time. Consultation was usually organized on a voluntary basis, but it took place whenever a national economic crisis or any sectoral problems arose. In the Turkish chemical industry, all levels of employers and employees concerned were involved in consultation.²⁶ Atanor stated that when it knew who would be affected, those workers also participated in the consultation processes through their representative organizations.²⁷ BASF and Evonik Industries did not directly conduct individual consultations with employees who might potentially be affected.²⁸ Solvay Ibérica said that direct consultation with the workers affected was rare.²⁹ In Japan, many large chemical companies stated that they made use of the existing framework of in-company labour-management consultation structures. Consultation forums were conducted regularly, once a month, between the company and trade unions in order to promote business information sharing. However, during restructuring, companies took a more flexible approach and organized as many consultations as was deemed necessary. One company stated that it did not limit their

¹⁹ Information provided to the ILO by Evonik Industries AG.

²⁰ Information provided to the ILO by Solvay Ibérica SL.

²¹ Information provided to the ILO by BASF SE.

²² Information provided to the ILO by Evonik Industries AG.

²³ Information provided to the ILO by Solvay Ibérica SL.

²⁴ Information provided to the ILO by Atanor SAC.

²⁵ Information provided to the ILO by Borealis AG.

²⁶ Information provided to the ILO by KIPLAS.

²⁷ Information provided to the ILO by Atanor SAC.

²⁸ Information provided to the ILO by BASF SE and Evonik Industries AG.

²⁹ Information provided to the ILO by Solvay Ibérica SL.

number, but held consultation sessions whenever necessary. Some problems were thoroughly discussed with trade unions until they were fully convinced of the need for the planned change. One company stated that one particular topic took more than six months to resolve and required over ten rounds of consultation.³⁰

- 150.** Prior and thorough consultation in times of restructuring is common practice in the chemical industry. The industry ensures the involvement of employees and their representative organizations in consultation, sharing ample information on corporate business and structural change, including sensitive information. By doing so, the industry does more than abide by legal requirements and local procedures, because there is a long tradition of partnership with open dialogue between employees and employers in the chemical industry in many countries, and it is considered one of the factors of business success. It should be noted, however, that prior consultation seldom takes place at small chemical enterprises. Small trade unions are less likely to receive prior and thorough consultation than large trade unions. They often do not know what restructuring will take place in the chemical industry, because they do not participate in institutionalized social dialogue forums at the central and state levels. In Brazil, major trade unions received prior communication from firms concerning possible structural changes, technical changes and other important issues. According to employers, this was to prevent any misunderstanding with trade unions, which could call for industrial action and thereby cause losses to the companies.³¹

5.4. How to promote social dialogue

- 151.** How can social dialogue be promoted at the workplace in times of restructuring? Three major factors are crucial for well-functioning workers' representative organizations to have sound social dialogue at the workplace.
- 152.** First, information is imperative for a well-functioning workers' representative organization. With respect to restructuring, workers' representative organizations must receive information on the economic and financial situation of the establishment and on the employment situation. This information should be provided in a timely and sufficiently detailed manner. As previously discussed, about a quarter of workers' representative organizations in the chemical industry in the European Union have not received useful information concerning structural changes in their companies. This is also the case in all industries and services. According to the European Company Survey 2009, which included 27,000 private and public establishments, including chemical and pharmaceutical companies, about 85 per cent of employee representatives in Europe received information at least annually on the economic, financial and employment situations of the establishment, while 11 per cent never received such information (table 5.2). Some 66 per cent received information at least several times a year. Meanwhile, one out of three employee representatives received information on the employment situation on a monthly basis. Table 5.3 shows that only 17 per cent of employee representatives are frequently provided with confidential information.

³⁰ Information provided to the ILO by Nippon Keidanren.

³¹ ILO: *Restructuring and social dialogue in the chemical industry in Brazil*, Sectoral Activities Working Paper (Geneva, forthcoming).

Table 5.2. Frequency of company information provided to employee representation in the European Union, 2008 (percentage)

Information issue	Monthly	Several times a year	Once a year	Less than once a year	Never
Economic and financial situation	28.45	38.48	18.81	2.78	11.48
Employment situation	35.00	37.00	14.00	3.00	11.00

Source: European Foundation for the Improvement of Living and Working Conditions: *European Company Survey 2009: Overview* (Dublin, 2010), p. 51.

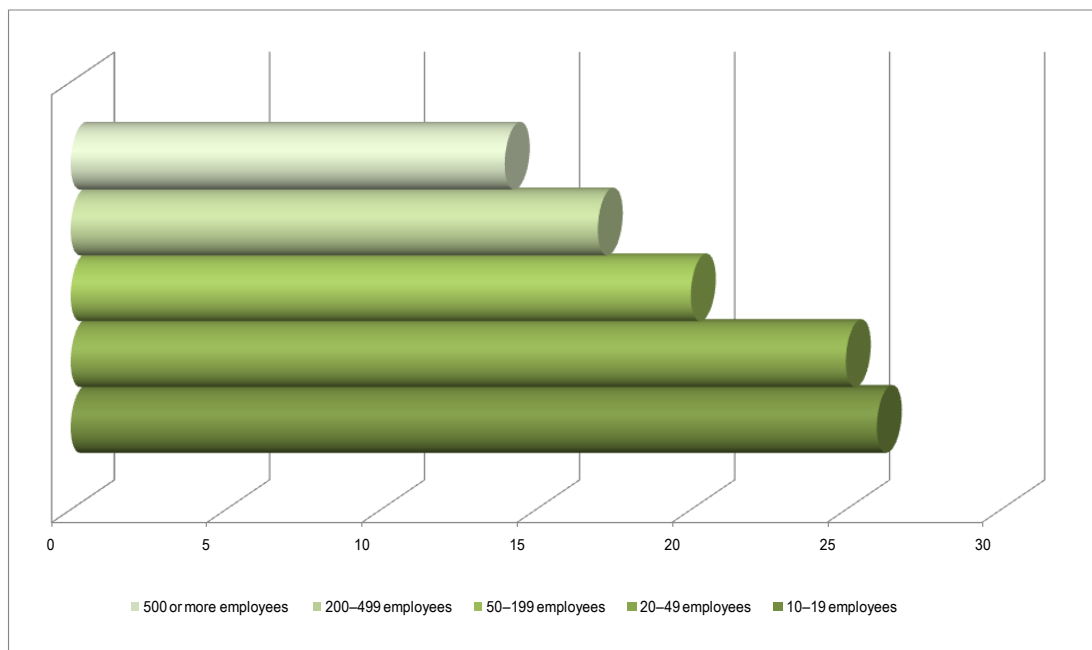
Table 5.3. Quality of information provided to employee representation in the European Union, 2008 (percentage)

	Frequently	Sometimes	Practically never
Information classified as confidential	17	41	42
	Yes	No	
Information timely and unrequested	67	33	
Information sufficiently detailed	74	26	

Source: European Foundation for the Improvement of Living and Working Conditions: *European Company Survey 2009: Overview* (Dublin, 2010), p. 51.

- 153.** Workers at small enterprises have more difficulty receiving information even once a year on the financial and economic or employment situation. Figure 5.1 shows that one out of four small establishments (fewer than 50 employees) fails to provide one of these types of essential information on a yearly basis.

Figure 5.1. Employee representations not receiving at least once a year financial and economic information, or information on the employment situation in the European Union, 2008



Source: European Foundation for the Improvement of Living and Working Conditions: *European Company Survey 2009: Overview* (Dublin, 2010), p. 51.

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- 154.** Second, training and time resources need to be given to employee representatives. Employees and their representatives need training to make sense of the business information disclosed to them, and to understand the business decisions to which they are required to contribute. Training for trade union leaders is also an important issue to direct the future of their country and the industry. In Brazil, the social partners in the chemical industry are involved in national development planning through social dialogue. In 2003, the Economic and Social Development Council (CDES) was established in Brazil to advise the President on the formulation of specific policies and guidelines, public policy proposals, structural reforms, and economic and social development in the country. The CDES expanded the role of tripartite social dialogue to include participation in decision-making on matters of strategic national importance. The CDES comprises 17 ministers and 90 advisors, including employers, trade union leaders and civil society organization leaders. Dialogue encourages information exchange and the exchange of ideas, and it helps to outline differences and find trajectories to confront problems and barriers. Through dialogue, the CDES seeks to build consensus among the different interest groups on the issues and challenges facing the country. At the state and municipal levels, there are seminars and social dialogue forums, in which industry, trade unions and academia participate. Training for trade union leaders is important so that they can effectively represent their interests at the national and state social dialogue forums. In 2009, for example, ABC's Chemical Workers' Union, representing about 40,000 chemical workers employed in about 900 companies in Brazil, decided to include in its training programmes a training module on trade union action and participation in the public administration advisory body in order to improve members' competence.³²
- 155.** Third, social dialogue provides the social partners with space and flexibility in the rapidly changing environment of the chemical industry. BASF stated that transparency, fairness, mutual respect, confidentiality, creativity and anticipation were essential in social dialogue, and creative solutions to issues between the social partners were always welcomed.³³ UBE Chemical Europe echoed BASF's viewpoints that dialogue could maintain and improve good relationships with workers and workers' representative organizations. The role of dialogue was most important at difficult times.³⁴ Borealis stated that keeping workers' representative organizations informed could create confidence between the parties concerned.³⁵ In addition to confidence, Solvay Ibérica pointed out that it was important to respect people and that consultation should be identified with clear objectives. That would ensure flexibility in finding amicable solutions that met the demands of both parties.³⁶ Evonik Industries emphasized the importance of involving the workers' representatives as early as possible, in order to provide them with information and as a sign of respect. It was important that the company heard their fears and criticism and provided answers.³⁷
- 156.** In summary, in order to institutionalize constructive social dialogue at the workplace, employee representatives and managers need to be positive about the climate for, and the

³² ILO: *Restructuring and social dialogue in the chemical industry in Brazil*, Sectoral Activities Working Paper (Geneva, forthcoming).

³³ Information provided to the ILO by BASF SE.

³⁴ Information provided to the ILO by UBE Chemical Europe SA.

³⁵ Information provided to the ILO by Borealis AG.

³⁶ Information provided to the ILO by Solvay Ibérica SL.

³⁷ Information provided to the ILO by Evonik Industries AG.

effects of, social dialogue at the workplace. Positive support from managers for employee representation is required for social dialogue to take place. In European Union companies with institutional employee representation, 70 per cent of management representatives stated that employee representation was constructive in finding ways to improve workplace performance. The same percentage also agreed that consulting employee representation about important changes led to greater staff commitment in the implementation of those changes. Only 30 per cent of management believed that the involvement of employee representatives led to considerable delay. To this end, employee representatives had access to vital resources, such as training measures and information on the economic and employment situation of the establishment, and enough time off from their normal work to carry out their representative duties. In October 2003, European-level social partner organizations issued a joint text, *Orientations for reference in managing change and its social consequences*. The document aimed to promote the development and dissemination of good practices, and it identified a range of factors that could contribute to preventing or limiting the negative social impact of restructuring (box 5.2). It emphasized three points as most significant for dialogue in restructuring: (1) employers should exercise continuous, quality communication with workers and/or their representatives; (2) information should be disseminated speedily to workers; and (3) companies might find it useful to establish monitoring mechanisms to evaluate the effects of the restructuring process and to check the medium- and long-term efficiency of the measures introduced.³⁸

Box 5.2

Excerpts from the European Union social partners' joint text on restructuring

2. Explaining and giving the reasons for change

It is essential to explain and give the reasons for change in good time to workers and/or their representatives in the company concerned by setting out the company's overall strategy.

An open discussion on the intentions of the management, in some cases based on documents explaining the reasons for the decisions and their possible consequences, allows workers and/or their representatives to make their views known.

An understanding of this strategy is essential to create a positive climate for discussion and a climate of confidence. Involvement of managers is also a factor for success.

The obligations arising from the legislative and contractual framework on worker information and consultation as well as on confidentiality must be met.

Good information and consultation of the workers and/or their representatives throughout the process of change may involve a different relevant level depending on the time and subject under consideration. ...

6. Managing restructuring

The social consequences are managed locally. In case of "social plans", the negotiation takes account of factors such as the company's constraints, the tax regime, national legislation, collective agreements and the needs and choices of workers.

All the case studies stressed a concern to explore all possible alternatives to dismissals such as for example:

- reassignment;
- training;
- reconversion;
- support for business creation;
- an agreement to diversify forms of work and employment and/or suspend or adapt some benefits on a temporary basis;

³⁸ UNICE/UEAPME/CEEP/ETUC: *Orientations for reference in managing change and its social consequences*, <http://ec.europa.eu/social/BlobServlet?docId=2750&langId=en> [accessed 20 Mar. 2011].

- personalized worker support;
- natural departures, notably through retirement or, as a last resort, early retirement.

Management of the social consequences of a restructuring operation is a complex process. Several levels of information, consultation or negotiation and several types of workers' representation may co-exist in the companies and countries concerned.

For a good management of restructuring, time is an important factor, for management and workers alike. The difficulty is organizing quality information and consultation without creating undue delays and uncertainties. A positive attitude to change together with the existence of a climate of confidence between management and workers and/or their representatives are key factors. Beyond formal procedures, informal relations play an important complementary role in the search for solutions which meet the needs of the enterprise and workers.

Given that ongoing change is a characteristic of the lives of companies and workers, some of the case studies revealed that the policies implemented during a restructuring operation were based on lessons learnt from an earlier experience. In this context, it has proved useful to put in place monitoring mechanisms to evaluate the effects and check the efficiency of the solutions identified in the medium and long term.

Source: UNICE/UEAPME/CEEP/ETUC: *Orientations for reference in managing change and its social consequences*, <http://ec.europa.eu/social/BlobServlet?docId=2750&langId=en> [accessed 20 Mar. 2011].

5.5. Responses to globalization

157. As the chemical industry is a globalized business, social dialogue forums have expanded to the regional and global levels. Under Council Directive 2001/86/EC, concerning worker involvement in a European company (Societas Europaea (SE)), any arrangement for transnational involvement, i.e. information and consultation, plus, in some circumstances, board-level employee participation, must be negotiated for each SE between the company or companies involved and a special negotiating body of employee representatives (statutory fall-back provisions apply if no agreement is reached). Only once the employee involvement agreements are resolved can the SE be registered. In 2007, BASF signed an agreement with employee representatives from across Europe on employee involvement in BASF SE, which came into effect in 2008. With regard to board-level employee participation, the agreement provides that six of the 12 members of the BASF SE supervisory board, which oversees the management board in a two-tier board structure, are employee representatives. Five of the six employee representatives are works council members and union officials from Germany, one of whom also represents the EMCEF, while one is a works council member from Belgium. Transnational information and consultation for employees will be through a new BASF EWC, made up of workforce representatives from across Europe. Initially, there were 23 members from 12 countries in Europe. The forum meets three times a year for information and consultation on company plans and developments, with an EMCEF representative entitled to attend. It has, notably, strong rights with regard to company decisions with consequences for employment, with the agreement stating that such decisions will remain open until they have been subject to in-depth and conclusive discussions with the employee representatives. The agreement also allows the BASF EWC to hold meetings in individual countries to keep employees informed at the national level.³⁹

158. Similar agreements were concluded at Aventis in 2001 and at Total in 2004. In the Aventis agreement, the size of the Aventis supervisory board was increased from ten to 14 full members, with the four new members nominated by French and German trade unions and voted to the board by the company's shareholder assembly. These employee representatives have the same rights and responsibilities as the other ten board members

³⁹ "BASF agrees SE employment involvement arrangements", in *European Employment Review* (London, Industrial Relations Services), 12 Nov. 2007.

representing shareholders. In addition, the French Works Council is entitled by national law to nominate two representatives to attend supervisory board meetings. It was agreed that the French Works Council would allow the EMCEF to have one of these two places as a “guest”. In return for giving up a place, it would then have the right to representation on Aventis’s EWC, or on the European Dialogue Committee, which was set up in 2000 by agreement between management, trade unions and employee representatives on the former EWCs for the various divisions of Rhône-Poulenc and Hoechst.⁴⁰

- 159.** At Total, an agreement on a “platform for employee relations” (*plate-forme sociale*) was signed between Total and four European-level trade union organizations. The new platform added to the provisions of the existing EWC agreement a statement that, in the event of exceptional circumstances bringing about significant change in the group’s progress or structure, a meeting of the EWC liaison committee (an employee body) was to be held in the eight days following the relevant meeting of the company’s board. Management would provide all information useful for examining the situation to the committee. After the liaison committee had considered the matter, an extraordinary meeting of the full EWC could be called, either by the committee or by a majority of EWC members. This would not occur before the start of national-level consultations on the restructuring in question; neither would it interfere with such consultation, provided that the EWC was brought to the attention of workers’ representatives involved in national-level consultations. Group management would take into account the impact of restructuring or closures on companies’ “industrial environment” and provide technical support in examining or implementing specific actions to assist in creating jobs in the surrounding areas, such as help in setting up companies. The agreement stipulates that workers’ representatives are not obliged to accept all restructuring exercises, reorganizations and closures, and that these remain the responsibility of group management. The implementation of the agreement in group businesses would be discussed twice a year at meetings of the EWC’s liaison committee. Actions taken in all the areas covered by the agreement would be assessed and debated, and the assessment provided in a brief annual report, which would also be sent to the various group businesses. If the parties identified difficulties in implementing the agreement in any group business, they could request a specific meeting on the issue, to be organized by agreement with group management.⁴¹
- 160.** In the emergence of globalization, union involvement in cross-border alliance is crucial. The nature and intensity of participation in cross-border trade union alliances are shaped by the union dynamic at the local, national and international levels. A combination of greater workplace union resources and a strong supportive approach by the national union can contribute to proactive solidarity strategies within international trade union networks.⁴²
- 161.** In recent years there has been an upsurge in efforts by trade unions to set up worldwide councils and networks within multinationals, or to organize campaigns that involve the

⁴⁰ “ECS-style European board-level participation agreed at Aventis”, in *European Works Councils Bulletin* (London, Eclipse Publications Ltd), Issue 33, May–June 2001, p. 2.

⁴¹ “European ‘employee relations platform’ agreed at Total”, in *European Works Councils Bulletin* (London, Eclipse Publications Ltd), Issue 55, Jan.–Feb. 2005, pp. 4–5.

⁴² C. Lévesque and G. Murray: “Trade union cross-border alliances within MNCs: Disentangling union dynamics at the local, national and international levels”, in *Industrial Relations Journal* (Coventry, Warwick University Industrial Relations Research Unit), Vol. 41, No. 4, July 2010, pp. 312–332.

creation of ongoing links among national chemical unions in various countries. These are unilateral initiatives by trade unions to promote dialogue between employers and employees to resolve disputes arising between the parties concerned. ICEM's international networks of chemical trade unions covering multinational enterprises are effective tools for implementing cross-border social dialogue. They also help to build trade union engagement with other unions internationally, which is vital to delivering international solidarity action.

- 162.** Five key factors are required to develop strong international networks of trade unions: how networks are formed; company attitudes and influence; resources; the potential for participation; and the spatial basis of membership.
- 163.** In terms of how networks are formed, time and resources are needed for the educational processes required. Company attitudes and influence are closely linked to the resources issue; the network's degree of independence needs to be as great as possible, and therefore more independent funding is needed.⁴³ One example of such a network can be seen at BASF; in this network, there is no central dialogue, but rather a set of regional networks established over a period of around ten years. This is a highly devolved structure, sustained by a combination of external project funding from the Friedrich-Ebert-Stiftung (FES) and company financing, and built on a regional basis with the involvement of ICEM. Regional dialogue with management has been secured in Latin America and Asia. Coordinated bargaining with each region has been achieved, albeit to varying extents. The right to organize has also been won in practice, most notably in some Latin American workplaces. Definite gains have been made. This example shows the importance of the degree of commitment to the network's structures and power relations.
- 164.** ICEM has developed numerous global, regional and corporate workers' networks. At the global level, there is the World Conference for the Chemical Industries. At the regional level, there are nine networks operating in the chemical and pharmaceutical industries, including the Middle East and North African Chemical Unions' Network; the Asia-Pacific Pharma Workers' Network; BASF's networks in Latin America and the Asia and Pacific region; the Akzo Noble Latin American Network; the Solvay Latin American Network; the Bayer Latin American Network; and two global company union networks operating among the workers of Akzo Noble and Unilever. According to ICEM, the principal duties are the exchange of information and experiences on collective labour agreements, wages, working hours, shift work, bonus and lump-sum allowances, paid holidays, retirement schemes, organizing strategies, occupational safety and health, and on a particular company's or sector's information. Networks build cross-border union solidarity through joint action and international solidarity campaigns. Implementing effective communication strategies is one of the major functions.⁴⁴ The ICEM World Conference for the Chemical Industries, held in Istanbul, Turkey, on 27–28 October 2010, decided the major points of a future action plan, which include the creation of the Global Pharmaceutical Unions' Network in the coming years.⁴⁵

⁴³ R. Croucher and E. Cotton: *Global unions, global business: Global Union federations and international business* (London, Middlesex University Press, 2009), pp. 69–79.

⁴⁴ ICEM: *ICEM World Conference for the Chemical Industries*, Istanbul, Turkey, 27–28 October 2010, Conference report (Geneva, 2010), pp. 61–66.

⁴⁵ ICEM: *Major points of future action plan*, ICEM World Conference for the Chemical Industries, Istanbul, Turkey, 27–28 Oct. 2010, p. 2, <http://www.icem.org/en/4-Chemicals-Pharmaceuticals> [accessed 20 Mar. 2011].

5.6. Global framework agreements

- 165.** Global framework agreements (GFAs) or international framework agreements (IFAs) that are currently in effect and are reviewed regularly with company officials and trade unions globally within the ICEM, include: Rhodia, EDF, Lukoil, SCA, RAG, Eni, AngloGold, Norske Skog, Endesa, Freudenberg, Statoil, Lafarge, and Umicore.⁴⁶ It should be noted that during global economic downturns, sectoral global social dialogue is a relevant and useful instrument that can help bring solutions to the challenges faced by sectoral parties operating within a global framework. In 2009, due to a dramatic dip in global demand and a decline in production of about 30 per cent, Rhodia engaged in a process of restructuring its global supply chain. ICEM used the GFA with Rhodia as a basis for raising the question of compensation for workers made redundant when the Rhodia production plant in China was threatened with permanent closure. Subsequently, local management agreed to use measures of temporary layoffs and temporary closures instead of compulsory redundancies and permanent closures, and to support workers with severance pay.⁴⁷ In line with the GFA at Umicore, bipartite social dialogue has led to a resolution of conflicts between the parties in South Africa concerning the structure of employment, recruitment processes, the integration of plants in South Africa, and training and education.⁴⁸
- 166.** In response to globalization, transnational company agreements (TCAs) have been emerging as innovative dialogue initiatives. TCAs are labour-management agreements signed by multinational companies, on the one hand (e.g. GFAs or IFAs), and European and/or international federations of workers representing national unions by sector of activity and/or multinational EWCs, on the other. The purpose of TCAs is to stimulate global social dialogue on employment-related issues between the multinationals and the representatives of workers. Most TCAs aim to promote compliance with ILO standards, notably in the areas of freedom of association and collective bargaining. TCAs can contribute to mitigating the impact of restructuring plans on employment, notably by: avoiding compulsory redundancies; establishing accompanying measures, such as training or outplacement assistance; designing management plans of change with a focus on professional development and social dialogue; and establishing transnational intra-firm mobility mechanisms to apply in the event of seasonal or more permanent unemployment. Studies show that three factors seem to have facilitated the signing of innovative cross-border restructuring agreements: (1) forward-looking human resources strategies that see TCAs as tools for managing risk during the process of business expansion and internationalization of the company's activities, and that give a central role to transnational processes for labour-management relations (such as EWCs); (2) trade union coordination resulting in specific mandates being given to global and European industry unions (or the EWCs) to negotiate and sign cross-border-level agreements directly on behalf of the enterprise's workers and their affiliated unions in countries where the multinationals operate; and (3) joint communication to ensure stability and minimize the risk of conflict during the crisis, especially in major operating sites located in countries with a tradition of mobilization. The studies also suggest four key drivers for the successful implementation of TCAs: (1) communication before, during and after the agreement, so as to ensure workers' buy-in or ownership of the agreement; (2) effective, joint monitoring and follow-up procedures (ideally linking the headquarters/global and local operations levels); (3) a

⁴⁶ <http://www.icem.org/en/69-Global-Framework-Agreements> [accessed 20 Mar. 2011].

⁴⁷ K. Papadakis: "Restructuring enterprises through social dialogue: Socially responsible practices in times of crisis", Working Paper No. 19 (Geneva, ILO, Dec. 2010), p. 13.

⁴⁸ ICEM: "ICEM, IMF complete Umicore GFA mission to South African plants", in ICEM InBrief, 31 Jan. 2011 (Geneva).

forward-looking strategy of the company, which is often summed up in a management belief in the capacity of its existing labour force to continue to be employable after the crisis; a commitment to insourcing (rather than outsourcing) and investment in job-saving measures (e.g. training, paid leave); and (4) access to income-support measures from public funds available in locations where the company operates.⁴⁹

5.7. Corporate social responsibility

167. Corporate social responsibility (CSR) is becoming a central part of national labour policies in national development. For example, in 2010, the Government of Germany adopted the National Strategy for CSR – Action Plan for CSR. Its primary objective is to increase the number of firms that recognize and use CSR to shape their business strategies in accordance with the principle of sustainable development, because the Government believes that socially and environmentally proactive business practices can provide advantages to enterprises in the national and international arenas. The Action Plan consists of five main areas of action: (1) to anchor CSR more firmly in enterprises and public establishments; (2) to encourage even more small and medium-sized enterprises to practise CSR; (3) to increase the visibility and credibility of CSR; (4) to optimize the political framework for CSR; and (5) to make a contribution towards shaping the social and environmental dimensions of globalization.⁵⁰

168. Workers who are affected by restructuring need to be consulted before the restructuring programme takes place. In a number of recent high-profile cases, workforces learned about their employers' restructuring plans only after they were broadcast in the media. The most famous of these was the decision by the French car manufacturer Renault to close its Belgian plant at Vilvoorde in February 1997, with significant job losses. The company did not inform or consult employee representatives beforehand, even though it was obliged to do so under Belgian and French law. What came to be known as the Renault Affair was single-handedly responsible for a subsequent overhaul of Belgian law concerning workforce rights in a collective redundancy situation, and also gave impetus to the debate in Europe on issues of socially responsible enterprise restructuring and CSR.⁵¹ Another example showing the benefits of this law occurred at BASF in Feluy, Belgium. In June 2005, BASF announced the shutdown of its main production lines at its Feluy site. The restructuring was expected to result in the loss of 203 of a total of 306 jobs and to slash production capacity at the site by 75–80 per cent. The Renault Act required BASF management in Feluy to engage in consultation with trade unions in order to discuss social plans within the framework of restructuring.⁵² In 2001, the European Commission published a statement highlighting a package of measures that it was pursuing with a view to reducing the social impact of large-scale job cuts. In it, the Commission set out good company practice reflecting corporate social responsibility in respect of restructuring (box 5.3).

⁴⁹ ICEM: "ICEM, IMF complete Umicore GFA mission to South African plants", in ICEM InBrief, 31 Jan. 2011 (Geneva).

⁵⁰ Government of Germany, Ministry of Labour and Social Affairs: Draft National Strategy for Corporate Social Responsibility: Action Plan for CSR, as at 22 Sep. 2010.

⁵¹ "Socially responsible enterprise restructuring in Europe: Part one", in *European Industrial Relations Review* (London, Eclipse Publications Ltd), Feb. 2004, pp. 13–26.

⁵² European Industrial Relations Observatory on-line (Eironline): *BASF in Feluy to undergo restructuring* (Dublin), 11 Aug. 2005.

Box 5.3
European Commission checklist for corporate restructuring: Best practices

4. Best practices

Corporate social responsibility suggests that following best-practice behaviour, in addition to legal obligations, benefits companies and their key stakeholders.

- Inform and consult employees at the earliest opportunity on the anticipated business environment and business prospects.
- Involve all stakeholders in the design of restructuring plans.
- Keep redundancies to a minimum through redeployment within the company or, failing that, securing alternative employment in spin-off or other enterprises.
- Promote the employability of employees, and lifelong learning, at all times.
- Provide additional specific training at times of restructuring for those likely to be adversely affected.
- Be prepared to help fund the creation of alternative employment opportunities through supporting specific projects or establishing a special development fund.
- Be willing, where necessary, to use outside mediation to achieve solutions acceptable to all parties.

Source: *European Works Councils Bulletin*, Issue 34, July–Aug. 2001, p. 10.

169. The role of CSR in the chemical industry is gaining importance. The chemical industry has a poor public image, despite joint efforts and initiatives by the chemical industry's social partners to reverse this. In a European Chemical Industry Council (CEFIC)-led survey conducted in 2010 on public perceptions of the European Union chemical industry, the industry ranked sixth out of eight benchmark industries in terms of having a favourable image, and ranked below the overall average for all industries. The public image of the chemical industry has not improved much in the past six years.⁵³ Pharmaceutical producers often have poor public reputations, created in part by accusations against individual companies, the testing of new products at refugee sites and failing to produce products that are affordable to the general population. One recent dispute between the Government of Nigeria and Pfizer concerned clinical tests of treatment for meningitis, endemic in Nigeria, and was settled in May 2009. In the study, Pfizer treated 100 children infected with meningitis using an experimental antibiotic called Trovan. An additional 100 children, who were control patients in the study, received an approved antibiotic, the chemical compound ceftriaxone – although family attorneys allege that the dose was lower than recommended. Pfizer has insisted that its records demonstrate that no deaths were linked to Trovan or to substandard treatment, noting that the study showed a better survival rate for the patients on Trovan than those on the standard drug, and that mental damage and other serious disabilities were known after-effects of meningitis. Nonetheless, Pfizer settled for US\$75 million, indicating the importance of preserving positive aspects of a potentially fragile public image.⁵⁴ The Pfizer case highlights the rules and social obligations with which chemical firms must comply, as good corporate citizens, at all times and everywhere in the world.

170. Chemical manufacturing sites are often located in small communities, where they are very visible because of the size of their facilities and the number of employees. Dow Chemical has developed an instrument of dialogue called a community advisory panel (CAP) to engage in open and honest dialogue between its representatives and the local population.

⁵³ European Chemical Industry Council (CEFIC): *Facts and figures 2010* (Brussels).

⁵⁴ "Pharma shifts focus to emerging markets", in *Oxford Analytica* (Oxford), 4 Sep. 2009.

CAPs are set up at Dow sites on account of the strategic importance of the firm's business in the surrounding communities. Since 2004, Dow has set up 36 CAPs throughout the world. CAPs normally consist of 15–20 people. They include three Dow representatives – the site leader (the person with overall authority at the site), the public affairs leader, and the environmental, health and safety leader. When choosing community members, Dow identifies the stakeholder groups that are essential to its operations. Community members may include teachers, students, clergy, business owners, environmentalists, government employees, directors of charities, trade union leaders and retirees. Community members are not paid by the company. Dow has established a number of ways of integrating panel feedback into its thinking. Typically, after a panel meeting, the three Dow representatives will meet informally and discuss what they have heard at the CAP. With wide latitude at the local level, they are in a good position to pursue the ideas that were discussed. For example, if Dow is to make an impending announcement about job reductions or expansion, it will have already completed quite a bit of communications work – a news release, a press kit and so on. The CAPs would be able to review the material in advance and let the company know whether the message had come across as intended. The company feels a very strong obligation to inform CAP members of what happens, because the CAP represents a wide range of stakeholders in the community in which Dow Chemical operates.⁵⁵

⁵⁵ J. Ring: "Connecting with communities at Dow Chemical", in *Corporate Responsibility Management* (Chicago, IL, Melcrum Publishing), Vol. 1, Issue 2, Oct.–Nov. 2004, pp. 26–29.

6. Summary and suggested points for discussion

6.1. Summary

- 171.** Chemical firms restructure in order to increase their competitive advantage. Between 1987 and the third quarter of 2009, a total of 2,203 M&A, worth more than US\$1.6 trillion, have taken place in the chemical and pharmaceutical industries. In the past, M&A took place mainly in Europe; in recent years, however, the number of M&A in North America and the rest of the world has risen significantly. Cross-border M&A are now seen everywhere, from Europe to North and Latin America and Asia.
- 172.** The consequences of M&A are most noticeable in employment.
- 173.** First, there are job losses throughout the global chemical industry. According to UNIDO, global employment in the chemical industry (including the pharmaceutical sector and the rubber and plastic products sector) exceeded 13 million in 2000, but this gradually declined to around 11.5 million in 2006 – a loss of more than 1.5 million jobs. The real global employment figure may be much greater than this. Because UNIDO statistics are fragmented, the ILO estimates that up to 20 million people work in the global chemical, pharmaceutical, and rubber and tyre industries today.
- 174.** Second, global employment is concentrated in fewer countries, with fewer chemical-producing countries containing the majority of the chemical workforce. These countries include the 27 Member States of the European Union, Brazil, China, India, Japan, Mexico, Republic of Korea, Russian Federation and United States. These countries account for nearly 60 per cent of total employment in the chemical industry.
- 175.** Employment in the chemical industry in Asian countries shows rapid growth, particularly in China and India. At the end of 2008, total employment in China's chemical industry exceeded 4.5 million people. Around half of the chemical workforce is employed in the manufacturing of chemical raw materials and chemical products sector, and nearly 1 million people are employed in the next largest sector, the pharmaceutical sector. India's chemical industry suffered a recession in the early 2000s. Between 2002 and 2003, nearly 180,000 jobs were lost; however, between 2005 and 2008, at least 293,000 jobs were created. At the end of 2008, employment in India's chemical industry had reached nearly 2.2 million.
- 176.** Third, jobs in small chemical enterprises are more likely to be vulnerable to restructuring than those in medium-sized and large enterprises. For example, between 1993 and 2009, the Japanese chemical industry lost nearly 80,000 jobs. Most of these job losses hit small firms. Around 51,000 jobs were lost at enterprises with fewer than 29 employees. By contrast, medium-sized enterprises with between 30 and 500 employees gained around 113,000 jobs. In the European countries, between 2007 and 2008, small and medium-sized chemical firms with fewer than 250 employees lost over 8,000 jobs.
- 177.** Long working hours appear to be the norm in the chemical industry. Weekly actual working hours by occupation in the industrial chemical sector show that in 2008 chemical workers worked more than 40 hours a week. On average, chemical technicians worked 40.56 hours a week; chemical engineers, 41.47 hours a week; supervisors or general foremen, 41.50 hours a week; labourers, 42.31 hours a week. Production workers worked the longest in the industry at 42.32 hours. In some countries, chemical production workers exceeded 50 hours a week, with men being more likely to work longer hours than women.

Weekly working time has been reduced in many countries over the past decade; however, in some countries long weekly working time is still a practice.

- 178.** Longer working hours in the chemical industry may be linked to high pay. In many ILO member States, pay levels in the chemical industry have been increasing in the past ten years, at a time when most restructuring has occurred. In advanced economies, annual wage increases seem to be greater than the national average wage increases. While acquisitions spontaneously push up pay levels, these then gradually decline a few years after completion of the acquisition. Furthermore, there are considerable wage gaps. First, there is a wide wage gap according to gender; on average, women earn between about 95 per cent and 66 per cent less than men earn. Second, chemical workers in emerging economies earn much less than many other workers employed in other industries and service sectors. Their wages are sometimes less than the national average wage. Third, where negotiation is decentralized, the wage gap by area/region is likely to be greater in the chemical industry in a given country.
- 179.** The global economic crisis had a negative impact on employment in the chemical industry; however, this impact was not uniform among ILO member States. Significant job losses occurred in Western Europe and the United States in particular. Employment in the chemical industry in the 27 Member States of the European Union showed a slight increase from around 3 million in 2005 to around 3.1 million in 2007. The crisis resulted in a decrease in employment to 2.8 million in 2008. However, in 2009, employment recovered, reaching 3 million, and by the first quarter of 2010 was once again at around 3.1 million. By contrast, employment in the chemical industry in the United States shows a constant decline in recent decades. The crisis resulted in further deterioration in employment in the United States chemical sector; between 2008 and 2009, nearly 70,000 jobs were lost, accounting for around 5.1 per cent of the total workforce in the United States chemical industry. The most severely affected sectors were the plastic products manufacturing sector and the rubber products sector, and the most affected occupations were production-related rather than administration, including those in construction and extraction; installation, management and repair; production; and transportation and material moving. It should be noted that during the crisis some countries saw an increase in employment in the chemical industry. Between 2007 and 2008, more than 22,000 jobs were created in Central and Eastern European countries. Japan created more than 65,000 jobs during the crisis.
- 180.** The shortage of skilled workers has been a challenge for the chemical industry in recent years. Skilled craft workers are scarce because there are significantly fewer of them today than in the past, and because the chemical industry is competing with other industries for their services. Firms offer more than just good wages to young talented workers, they also offer attractive recruitment packages, and they try to change managerial perceptions and attitudes towards the needs of young skilled workers. Chemical firms are also taking positive action to train workers, using their own resources. One of the measures to attract young skilled workers is to implement people-centred workplace policies or work-life balance policies.
- 181.** The shortage of scientists has become acute, owing to increasing demands from expanding R&D activities on a global scale, and competition to employ these workers has intensified. This has prompted scientists to migrate among countries in developed economies, as well as to migrate between developed and developing economies.
- 182.** Firms are also taking positive action to increase the number of women working in the industry. However, the percentage of women in the industry remains low and therefore the number of women executives in chemical firms is still limited. Chemical firms have far fewer women executives than the average in the Fortune 500 manufacturing sector firms. On the one hand, talented women workers are struggling to pursue careers in the chemical

industry, and, on the other, there is a significant shortage of skilled workers in the technical and production segments in the industry.

- 183.** The global economic crisis motivated the chemical industry to take a proactive approach to creating opportunities for the future. The social partners in the chemical industry have been promoting training, retraining and lifelong learning, in order to increase employability in line with the Global Jobs Pact. The chemical industry responded swiftly to the crisis by promoting future-oriented policies; where layoffs and short-time work become necessary, every effort should be made to improve workers' skills through training and education, and this training should be accredited to ensure that intrinsic skills are maintained and the industry can retain competent people.
- 184.** Not all restructuring bears fruit. According to one study, around half of recent M&A are held to have destroyed rather than created value. Excessive downsizing of labour in the course of restructuring can harm a company's growth. Poorly organized restructuring runs the risk of decreasing workers' loyalty and motivation, which might encourage talented workers to move to other jobs. Successful restructuring requires that the different corporate cultures are appropriately merged prior to the acquisition taking place. Social dialogue plays a critical role in developing trust between the companies involved, leading to successful integration.
- 185.** Social dialogue is defined by the ILO to include all types of negotiation, consultation or simply exchange of information between, or among, representatives of governments, employers and workers, on issues of common interest relating to economic and social policy. It can exist as a tripartite process, with the government as an official party to the dialogue, or it may consist of bipartite relations only between labour and management (or trade unions and employers' organizations), with or without indirect government involvement. Social dialogue processes can be informal or institutionalized, and are often a combination of the two. Social dialogue can take place at the national, regional or enterprise levels. It can be inter-professional, sectoral or a combination of these. The main goal of social dialogue itself is to promote consensus building and democratic involvement among the main stakeholders in the world of work. Successful social dialogue structures and processes have the potential to resolve important economic and social issues, encourage good governance, advance social and industrial peace and stability, and boost economic progress.
- 186.** Restructuring not only affects employment and conditions of work in the chemical industry, it also increases the role of social dialogue. Social dialogue can generate a higher return to shareholders. Those companies that have the most effective social dialogue with their employees provide a higher return to shareholders than those with poorly managed employee communication. The chemical industry has expanded the role of social dialogue, redefining it as a practical instrument contributing to social justice, and many chemical firms have institutionalized formal dialogue processes to provide feedback. Social dialogue can also benefit the industry by identifying future directions and needs for the industry to grow sustainably. The global economic crisis has tested social dialogue and, as a result, additional important roles for social dialogue as an instrument for finding solutions in difficult times have been formulated.
- 187.** As a last resort, chemical firms sometimes have to make the difficult decision to lay off employees, for valid economic reasons. Chemical firms need to ensure that this process is carried out fairly, and social dialogue can be the means to do so. It provides the parties concerned with a programmatic solution so that the individual workers' needs and their particular circumstances are taken into account.
- 188.** During restructuring, and any other contingency that might impact on workers, prior and continuous consultation between the parties concerned is the norm in the chemical

industry, which subscribes to the principle that open and transparent dialogue is a factor in business success. A wide range of useful information concerning corporate financing and business information, including confidential and privileged information, is normally shared with workers and their representative organizations, and this allows them to make independent decisions and present proposals to employers, thereby contributing to the increased implementation of mutual agreements. When management operates transparently and fairly, the results can be productive. Corporate social responsibility also requires chemical firms to behave as responsible corporate citizens and to respect best-practice performance and activities through a wide range of measures in order not to affect adversely their workers and society at large.

- 189.** Among the various approaches to social dialogue, collective labour agreements are important in restructuring in that they help to initiate negotiation between the parties. Collective bargaining helps the parties to reach an equitable agreement. When a contingency problem affecting the workers and company financial matters arises, collective labour agreements can mandate the company to inform the trade union of any related plans and their implications for conditions of work. However, collective bargaining does more than just trigger dialogue; sectoral bargaining in the European chemical industry has demonstrated the possibility of adapting collective labour agreements to a changing environment and meeting company demands for flexibility while accommodating workers' needs in a practical fashion. However, it may be true that widespread flexibility in sectoral collective bargaining has led to an increase in the decentralization of collective bargaining, shifting a large part of bargaining responsibilities to the company level.
- 190.** Outsourcing and contract labour are often at the centre of controversy in the chemical industry. Excessive outsourcing is placing more pressure on core workers (regular employees) to be more flexible, and what was once considered stable employment with better working conditions is becoming less so. According to a study at the European Union, in recent years in particular, many new forms of work flexibility are emerging in connection with outsourcing and contract labour. New forms of work, called "very atypical" forms of work, with much more unstable and shorter terms of employment, are replacing atypical forms of work. The type of workers engaged in very atypical forms of work tend to be extremely varied, ranging from very low-skilled workers on seasonal contracts to highly skilled professionals on short, task-focused contracts. These workers often face challenges: they have less job security, lack a fixed career plan, have fewer training and career development opportunities, and find it harder to reconcile working and work-life balance. Collective bargaining can also offer a solution to outsourcing. Cases show that collective labour agreements can regulate the use of contract workers. They can also request employers to implement consultation prior to the introduction of outsourcing in order to ensure that important human assets to firms will be protected in such a way that fundamental workers' rights are ensured.
- 191.** Because globalization of the chemical industry is advanced, global social dialogue forums can better fit the chemical industry than other industry and service sectors. GFAs or IFAs enable workers and workers' representative organizations to discuss not only corporate structural change but also a range of business and employment issues at the transnational level of the chemical firm concerned. GFAs can promote a system of information, consultation and dialogue at the various sites and plants operating in different countries within a multinational chemical firm. To meet the trade unions' own needs in light of growing cross-border M&A and transnational restructuring, ICEM has established a number of global and regional chemical company networks in order to exchange information on companies' undesirable behaviours and to help companies in the spirit of international solidarity. Some researchers observe that TCAs are emerging. TCAs are labour-management agreements signed by multinational companies and European and/or international federations of workers representing national unions by sector of activity

and/or the EWCs of the multinationals. These TCAs can encourage the multinationals to comply with ILO standards. TCAs can also mitigate the adverse impacts of restructuring.

- 192.** There are four important factors for promoting social dialogue in restructuring. First, employers should exercise continuous, quality communication with workers and their representative organizations. Second, comprehensive information must be disseminated quickly to workers and their representative organizations in an open and transparent manner, followed by consultation in good faith. Third, it can be useful for companies and workers, as well as for their representative organizations, to establish monitoring mechanisms to evaluate the effects of the restructuring process and to check the medium- and long-term efficiency of the measures introduced. Fourth, successful social dialogue depends on the social partners' capacities, particularly those of workers' representative organizations. Therefore, promoting social dialogue in the chemical industry provides workers and their representative organizations with adequate training and time resources, enabling them to upgrade their capacity to function as an equal partner with employers. Special attention must be given to workers and their representative organizations at small firms.

Suggested points for discussion

- (1) Which changes to employment, in both qualitative and quantitative terms, have occurred as a result of restructuring in the chemical and pharmaceutical industries?
- (2) How is the Global Jobs Pact being implemented in the chemical and pharmaceutical industries?
- (3) Which skills and qualifications, and which vocational training and education programmes, are conducive to sustainable development in the chemical and pharmaceutical industries?
- (4) How could the chemical and pharmaceutical industries be made more attractive to young workers and to women, and how could they provide better opportunities for long-term career development?
- (5) Which challenges are posed and which opportunities are afforded by contract and agency labour in the chemical and pharmaceutical industries?
- (6) Which are the best social dialogue practices to promote an atmosphere conducive to better industrial relations during restructuring in the chemical and pharmaceutical industries?
- (7) How can social dialogue improve the sustainability of small and medium-sized enterprises, helping to promote decent work in the chemical and pharmaceutical industries?
- (8) Which activities should the ILO take to promote social dialogue and good employer–employee relations in the chemical and pharmaceutical industries?