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Facilitating Adjustment: Sector Experiences from Agriculture, Telecommunications and Chemicals

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FACILITATING ADJUSTMENT: SECTOR EXPERIENCES FROM AGRICULTURE, TELECOMMUNICATIONS AND CHEMICALS

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ABSTRACT

This paper is a follow-up study to *Trade and Structural Adjustment: Embracing Globalisation* (OECD 2005) which identified policies for successful trade-related structural adjustment. It draws further policy implications through the analysis of three sectors which were not specifically/fully covered in the initial report: agriculture (tobacco and coffee), telecommunications and chemicals.

The report consists of two parts. The first part summarises the policy implications drawn from the sectoral case studies while the second part presents the case studies. The study draws some new policy lessons in terms of the usefulness of multilateral commitments, effects of domestic regulations that limit the ability of producers to supply markets (such as licensing and production quotas), potential issues related to state ownership in certain sectors of the economy, relationship between the public and private sectors in the adjustment process, role of subsidies, and sequencing and pace of reform. The case studies on agriculture (tobacco and coffee), telecommunications and chemicals highlight the diverse nature of the adjustment process both among sectors and different groups of countries. The following country experiences are reviewed in the respective sectors with varying emphasis: Brazil, Vietnam, Central America and East Africa in coffee; United States, European Union, Brazil, China and Malawi in tobacco; Morocco, Argentina and India in telecommunications; United States, Europe, Japan, Korea, ASEAN, China, Mexico and Saudi Arabia in chemicals.

Keywords: trade, structural adjustment, agriculture, coffee, tobacco, telecommunications, chemicals, petrochemicals, Brazil, Vietnam, Central America, Costa Rica, El Salvador, Guatemala, Honduras, Nicaragua, East Africa, Kenya, Tanzania, Uganda, United States, European Union, China, Malawi, Morocco, Argentina, India, Japan, Korea, ASEAN, Mexico, Saudi Arabia, reform, adjustment, multilateral commitment, multilateral rule making, trade remedies, safeguards, anti-dumping, trade liberalisation, domestic regulations, state-owned enterprises, subsidies, sequencing, investment

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The Working Party of the OECD Trade Committee discussed this report and agreed to make the findings more widely available through declassification on its responsibility. The study is available on the OECD website in English and French: http://oecd.org/trade

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EXECUTIVE SUMMARY

This paper is a follow-up study to *Trade and Structural Adjustment: Embracing Globalisation* (OECD 2005) which identified policies for successful trade-related structural adjustment. It draws further policy implications through the analysis of three sectors which were not specifically/fully covered in the initial report: agriculture (tobacco and coffee), telecommunications and chemicals. As it is a follow-up study focusing mainly on the trade policy related aspects, some important issues that were covered in the original report such as macroeconomic policy and labour policy are not covered explicitly. Thus this paper should be read in conjunction with the original report, in particular when considering policy implications.

The report consists of two parts. The first part summarises the policy implications from the sectoral case studies while the second part presents the case studies. The case studies highlight the diverse nature of the adjustment process both among sectors and different groups of countries. While some of the policy lessons cannot be readily transferred to other settings, some common themes emerge.

The first theme relates to how multilateral/plurilateral commitments and rules can facilitate structural adjustment. Broadly speaking, trade and investment liberalisation can facilitate the structural adjustment process by providing markets for new industries. Multilateral commitments may "lock in" trade and investment liberalisation by making backtracking difficult. Commitments on future liberalisation may act as a trigger for economic reform and facilitate structural adjustment by providing a roadmap for future liberalisation and reform. Scheduled reform may reduce the risk of regulatory reform reversals and foster business confidence that can facilitate investment in areas which benefit from reform. Similarly, multilateral rule making tends to promote good regulatory practice, such as transparency and promotion of competition, in relation to the implementation of commitments. This may especially be important for developing countries with limited governance institutions and experience. Although trade remedies such as safeguards may have potential benefits by providing breathing space for structural adjustment, excessive or improper recourse to such measures may delay structural adjustment.

The second theme relates to how domestic regulations can facilitate or hinder structural adjustment. Domestic regulations are a key determinant in the framework for structural adjustment; at the same time they are increasingly relevant in the context of multilateral trade rules. All case studies illustrate how domestic regulations that limit producers' ability to supply markets (such as licensing and production quotas) reduce competition, opportunities for investment and the private sector's ability to respond efficiently to market signals. State ownership which reserves certain sectors of the economy to the state may be a case in point. While state ownership may play a useful role in the economy, it may also delay the structural adjustment process if it leads to slow responses to changing markets. Review of such domestic regulations including state ownership if managed properly can yield significant benefits.

The third theme relates to the role of the public and private sectors in structural adjustment. The private sector–firms and individuals—is the main player in structural adjustment. However, governments can also play a constructive and sometimes decisive role. In areas where there is state-ownership or where there are existing government regulations which pose direct restrictions on entry to or exit from a certain sector, government action may be necessary for effective adjustment. The government also plays a key role in providing a broad enabling policy environment. While direct government intervention in the adjustment process may be warranted in some cases, such intervention needs to be handled with care to assure an efficient outcome. Subsidies or other governmental action to minimise social dislocation by delaying structural adjustment should be transparent and time bound. Unnecessary delay in structural adjustment may lead to greater and more difficult adjustment later on, especially if it keeps inefficient producers in the market. Structural change may have differential effects on different groups and it is not

always possible to have a predetermined single policy to meet all needs. In such cases it may be realistic to move ahead with reform while providing for flexible and decentralised adjustment policies to be provided based on local information. As is the case with national policy, such decentralised policies must be time-bound and provide a clear exit strategy. In addition, public-private partnerships may be effective in a world of imperfect information and market imperfections, allowing both governments and industry to better understand structural trends.

The fourth theme relates to sequencing and pace of policy reforms. Economic reform and trade liberalisation often entail several elements of reform which are pursued in parallel. While it is possible to pursue one or the other sequentially, all elements of reform are often mutually reinforcing. In telecommunications for example, privatisation, introduction of competition, and establishment of an independent regulator have been effective reform measures. In this sector, competition has been the most effective agent of change and establishment of an independent regulator has been the key to introducing effective competition. Privatisation without effective regulation has not necessarily improved service levels, yet establishment of independent regulatory authorities prior to privatisation has had a positive effect on investment in infrastructure and telephone penetration.

Gradual reform with a roadmap may ease adjustment by facilitating changes in resource allocation. Gradual reform may provide sufficient time for the private sector to react to changes. A roadmap for reform may further facilitate resource reallocation by increasing predictability and reducing risk. However, if reforms are too slow or there are indications of uncertainty in the direction and timing of reform, resource reallocation may be impeded. Liberalising input sectors may be important to allow smooth adjustment of output sectors. Parallel liberalisation of trade and investment has substantial merits. A well-functioning financial market also facilitates structural adjustment by providing the necessary incentives for adjustment and facilitating reallocation of capital to more productive uses.

The **coffee** case study addresses how the coffee industry has adjusted to sustained price decline, in particular, the so called coffee crisis where coffee prices fell to 100- year lows between 1999 and 2002. The dismantling of the International Coffee Agreement and national marketing boards, the boost of Brazilian coffee supply, the entrance of Vietnam as a leading coffee supplier, and changes in consumer preferences and technology were elements driving structural adjustment in this sector. The case of coffee is of particular interest because coffee is a product which is produced only in developing countries and mainly for developed country markets. The case study reviews experiences from **Brazil**, **Vietnam** and countries in **Central America** and **East Africa**.

The **tobacco** case study examines cases of structural adjustment in tobacco farming. The tobacco farming industry, which is present both in developed and developing countries, has undergone substantial adjustment, brought about largely in response to change in production and consumption patterns reflecting national and global tobacco-use cessation efforts. The case study has a strong focus on the experiences in the **United States**; however, the policy changes and market settings of **Brazil**, **China**, **European Union**, and **Malawi** are also presented to explore how these markets have adjusted.

The **telecommunications** case study addresses structural change and adjustment in the telecommunications sector, which has experienced profound change over the last two decades driven mainly by new technology and changing regulatory frameworks. Deregulation and re-regulation have resulted in more open and competitive markets. Trade and investment liberalisation for both telecommunications service providers and telecommunications equipment manufacturers have stimulated trade and economic growth. Starting with a cross-country study on the global telecommunications sector, this study looks closely at the sequencing of reform in **Argentina**, **India** and **Morocco**.

The **chemicals** case study addresses the structural change and adjustment in the chemical industry, focusing on petrochemicals. Rising oil prices, technological change and increased demand have triggered a change in supply-demand patterns, which is expected to continue in the future. Starting with a cross-country study on the global chemical industry, this study surveys experiences from **Mexico, Saudi Arabia,** the **United States** and countries in **Eastern Asia** and **Western Europe**.

FACILITATING ADJUSTMENT: SECTOR EXPERIENCE IN AGRICULTURE, TELECOMMUNICATIONS AND CHEMICALS

Introduction

1. The study *Trade and Structural Adjustment* (OECD 2005) identifies policies for successful trade-related structural adjustment. From case studies, the study identifies good practices, which capitalise on the opportunities of structural change and aim to impose minimal costs on individuals, communities and society as a whole. The Secretariat presented the findings of the study at forums where academics and policy experts commented on the findings.

2. Based on the feedback received from those forums, it was agreed to conduct a follow-up study to draw further policy implications through the analysis of three sectors which were not specifically / fully covered in the initial report; agriculture (tobacco and coffee), telecommunications, and chemicals.

3. This paper draws more specific policy implications with regard to trade related aspects. As this follow-up paper is focused on trade policy related aspects, some important issues that were covered in the original report such as macroeconomic policy and labour policy are not covered explicitly. Thus this paper should be read in conjunction with the original report, especially when considering its policy implications.

4. This follow-up report consists of two parts. The first part below summarises the policy implications from the sectoral case studies and the second part present the case studies.

PART 1: POLICY IMPLICATIONS

5. In the sectors studied, evolving global conditions made it necessary for industries to undergo structural adjustment; the reallocation of labour and capital to more efficient uses in response to structural changes. In some cases, such as chemicals in the United States, specific policy changes were not required for structural adjustment to take place; in others, structural adjustment was slowed down due to existing policy frameworks, necessitating structural reform.[1] In cases where trade protection and/or domestic regulations in place shielded industries from international markets initially (e.g. tobacco in developed countries, chemicals in China, and telecommunications worldwide), liberalisation in trade and investment was perceived as the driver of structural adjustment. It should be pointed out that even in such cases, structural change is actually driven by other factors such as technological change and change in consumer preferences; trade and investment liberalisation is merely the harbinger of structural change. In this era of globalisation, it is increasingly costly for countries to maintain trade protection and/or domestic regulations which shield inefficient industries from market forces. Protection of inefficient industries reduces welfare; but especially in industries that produce intermediate products or services, as inefficient inputs may result in user industries shifting production abroad or failing to take advantage of opportunities in new emerging industries.

1. It may be useful to differentiate the concept of structural adjustment which is the process of adjustment which does not necessarily involve government, and structural reform which is a process of policy reform that is initiated by government.

6. The case studies in this report highlight the diverse nature of the adjustment process, both among sectors and among different groups of countries. This is because industries in various countries have evolved differently based on different natural and human resource endowments, technologies, domestic regulatory frameworks, and levels of trade and investment liberalisation. Therefore, some of the policy lessons may not be readily transferable to other settings. However, there are some common themes emerging. Among the common themes are

- The importance of the enabling environment created by multilateral/plurilateral commitments and rules,
- The importance of the domestic regulatory environment,
- The importance of exercising caution when the state intervenes in markets and
- The importance of attention to sequencing of reform measures.

(1) How multilateral/plurilateral commitments and rules can facilitate structural adjustment

International commitments can progressively "lock in" practices facilitating structural adjustment

7. Multilateral commitments relating to trade or investment policies may act as a trigger for economic reform and structural adjustment. Such commitments can serve to lock in earlier liberalisation by making backtracking difficult. Forward looking commitments help countries sustain the liberalisation process and may provide a roadmap for necessary reform. These commitments reduce the risk of regulatory reform reversals and foster business confidence that can lead to higher levels of investment in sectors that benefit from the reform. International commitments may also aid domestic acceptance of reform, especially when there are stakeholders with strong vested interests in the status quo. Incumbent firms and workers who enjoy rents may accept reform if it is locked in through international commitments. Scheduled reform may reduce lobbying efforts and the associated costs. If governments have a clear intention to maintain a liberal trade regime, making binding commitments in international fora may be one way to signal its commitment to trade liberalisation.[2]

8. This was clearly illustrated in the telecommunications sector. The post-Uruguay Round negotiations in basic telecommunications acted as an external stimulus to reform. The resulting international commitments made in these negotiations served mainly to lock in liberalisation that had already been undertaken. Where countries made commitments into the future, they helped sustain the liberalisation process that was underway and served as a roadmap for reform.[3] International commitments to reform reduced risk of regulatory reform reversals. This often led to an increase in investment both by potential new entrants benefiting from reform and incumbents getting ready for increased competition. The introduction of competition in the telecommunications sector reduced employment levels in former public telecommunication operators (PTOs),[4] but investments by new operators created jobs which made up for much of the job losses in PTOs.

9. In the case of petrochemicals in Japan, the tariff reductions under the Chemical Tariff Harmonization Agreement (CTHA) served as a signal for increased global competition and the need for

2 . The delayed WTO commitments in the telecommunications sector by Morocco may have been examples where countries have made commitments in the WTO to lock in scheduled reform.

3 . See example of Morocco and Argentina (para 177-188)

4 . See paras 170 and 171

structural adjustment. The gradual tariff reduction commitments ending with a final reduction in the year 2004 served as a roadmap and target date for companies to plan their restructuring efforts.[5] China's tariff reductions before its WTO accession and its staged commitments upon entry to the WTO also served the same purpose for the chemical industry in China. In the case of Western Europe's chemical industry, the creation of a Single European Market – focusing on reduction of behind-the-border barriers, since tariffs had already been eliminated – served both as a trigger and facilitator for structural adjustment.[6]

10. Thus, multilateral and plurilateral commitments can be of great use to a country with the intention of using trade liberalisation as a trigger for structural adjustment. However, a word of caution may be warranted. While it is often easier for governments to present such trade liberalisation as a "concession" to outside pressure in order to gain acceptance by industry / the public, overt reliance on outside pressure for reform may lead to lack of ownership of reform.

Multilateral rule making can also be used to promote good practices

11. Multilateral negotiations and rule making may also facilitate the structural adjustment process by allowing countries to draw on their collective experiences in defining good regulatory practice. This may especially be important for developing countries with limited governance institutions and experience. For example, in telecommunications, the negotiations in basic telecommunications resulted in the creation of a "reference paper," which establishes a number of regulatory principles, or best practices, that countries can choose to include in their schedules as additional commitments. These principles[7] have facilitated the transition from a regulatory framework with state-owned monopolies to one which promotes effective competition.[8]

12. In the tobacco case, the adjustment policies undertaken by both the EU and the US seem to have been influenced by the Agreement on Agriculture (AoA). Both the EU and the US needed to reform their production quota systems, which were becoming unsustainable. While several methods could have been used in the reform, both the EU[9] and the US chose policies that only minimally affect production (decoupled policies), a core concept of the AoA.[10] According to work of the OECD, policies that are decoupled from production are more efficient in transferring benefits to the intended recipients and less trade distorting than coupled policies.[11] Decoupled policies are based on historic rather than current levels of production and do not require the beneficiary to continue to produce a particular product; they are less

5 . See paras 272 and 273.

6 . See para 265 on discussion of the effect of the Single European Market on the European chemical industry. The European experience also points out the benefits of liberalisation when the mobility of factors of production is facilitated and non-tariff barriers are dismantled, as this further liberalisation increases options for firms to adapt.

7 . These principles include competitive safeguards, interconnection, independent regulation, transparent licensing procedures and non-discrimination. Anti-competitive safeguards refer to measures taken to prevent anti-competitive practices such as anti-competitive cross-subsidization, use of information obtained from competitors with anti-competitive results, etc.

8 . See para 202 and 203.

9 . The EU permits Member States to use some coupled policies for four years (2006-2010) in its current tobacco policy reform.

10 . See para 135-138 and Box 7 for description of the US Tobacco buyout and para 147 for the new EU policy on tobacco.

11 . See for example OECD(2002).

likely to keep producers in declining sectors (e.g. tobacco in developed countries) but rather encourage structural adjustment.

Excessive/improper recourse to trade remedies such as safeguards and anti-dumping duties may delay structural adjustment

13. As noted in OECD (2005), trade remedies such as safeguards may have potential benefits in that they may provide breathing space for, and greater acceptance of, structural adjustment. However, considering that restrictions on trade are unlikely to affect the underlying structural forces, there is a need to ensure that these measures are time bound and that industry will adjust in the given period. The current safeguards agreement ensures that measures are time bound by limiting the duration of measures to an initial four years, which may be extended to a maximum of eight years (Article 7.1 and 7.3) and limiting repeated application of safeguards with respect to a given product (Article 7.5). The agreement also has in place provisions to encourage structural adjustment, for example by requiring evidence that the industry is adjusting to be presented in order to allow an extension (Article 7.2). It also requires safeguard measures in place for longer than one year to be progressively liberalised at regular intervals during the period of application (Article 7.4).

14. The Anti-dumping agreement, because it governs the application of anti-dumping measures which are a legitimate remedy to counter unfair dumping of products, does not foresee any structural adjustment to take place, and has no provisions related to adjustment. It does, however, provide for periodic review and includes a "sunset" requirement which establishes that dumping duties shall normally terminate no later than five years after first being applied, unless a review investigation establishes likeliness of continuation or recurrence of dumping and injury.

15. The case of petrochemicals in China points to the country's increasing use of anti-dumping duties[12] even while the global use of anti-dumping measures have peaked in 2001.[13] The wide range of countries subject to anti-dumping duties in the case of chemicals in China raises some doubts as to whether anti-dumping duties are being used for their intended purposes to counter unfair dumping of products. Improper use of anti-dumping duties in lieu of safeguards may impede structural adjustment as there are no in-built mechanisms to facilitate adjustment. Improved transparency would improve the situation for exporters who might be subject to anti-dumping investigations, to ensure they are treated fairly and due process is afforded to them, while maintaining the legitimate right for a domestic industry to seek recourse to trade remedies.

Trade liberalisation can facilitate the structural adjustment process by providing markets for new products and industries

16. Structural adjustment typically entails the movement of factors of production out of one industry (a declining or uncompetitive sector or in some cases a sector where rapid improvement in productivity has freed up resources) into another (new or expanding industries). Many developing countries have small domestic markets where new industries have much to gain from access to foreign markets. Tariff reductions by other countries through trade liberalisation initiatives may allow developing countries with small domestic markets to achieve economies of scale. Reduction of their own tariffs will encourage

12 . See Para 286 and Tables 20 and 21.

13 . While the number of anti-dumping investigations has increased since the 1980s, the numbers appear to have stabilised. Anti-dumping investigation initiations peaked in 2001 at 364 but has fallen steadily since then to 191 in 2005. India, China, the European Communities and South Africa reported the highest new initiations in 2005. China was by far the most frequent subject of new investigations during the same period followed by Indonesia, Chinese Taipei, India and Malaysia

competition in the domestic market, preparing domestic producers for competition in the export market and permit access to more competitive inputs. The development of the chemical sector in East Asian countries has been enhanced by multilateral trade liberalisation, tariff reductions at the regional level (e.g. under the Asian Free Trade Agreement [AFTA]) and tariff reductions by China.[14] The tariff reductions helped create a sizeable market in which companies could compete and achieve more efficient production.

17. Nowhere is the need for diversification higher than in countries dependent on a limited number of commodities for export revenue because they are particularly sensitive to volatile or declining commodity prices.[15] The coffee case shows that many coffee-producing countries are highly dependent on coffee for export earnings. Few coffee-producing countries, with the notable exception of Brazil, have moved up the supply chain to export processed coffee products. One of the impediments may be tariff escalation.[16] While tariffs are falling for all coffee products and preferences provided under the General System of Preference may alleviate the problem, tariffs on more processed products continue to be higher than tariffs on green coffee beans in some developed and developing countries. Flattening the tariff profile for coffee may be one of several steps to help small coffee producing countries to adjust.

(2) How domestic regulations can facilitate or hinder structural adjustment

18. Domestic regulations are a key determinant in the framework for structural adjustment. As tariffs and various border measures have been lowered or eliminated, the relative importance of domestic regulation has increased. Domestic regulations are increasingly becoming relevant in the context of multilateral trade rules.

Domestic regulations such as licensing and production quotas reduce competition, opportunities for investment and the private sector's ability to adjust to structural changes

19. An important lesson in all three sectors studied is that regulations which restrict market entry may reduce competition, opportunities for investment and the private sector's ability to respond efficiently to market signals, which impedes structural adjustment. Licensing, production quotas, or other barriers to entry may be put in place to achieve certain legitimate policy objectives. However, when combined with other trade barriers, they may effectively shield product markets from competition. Lack of competition reduces incentives for change. Entry barriers will preclude innovators from taking advantage of opportunities for investment. It may also create vested interests which oppose and delay adjustment. Therefore, domestic regulations that pose restrictions to market entry need to be reviewed regularly.

20. The US tobacco case provides an example of a quota system which had a built-in adjustment mechanism which reflected changes in market conditions. The data show that the US tobacco industry went through considerable restructuring in response to changing market conditions. However, even with this regular monitoring of the quota, the US producers did not adjust sufficiently to market changes, leading to gradual loss of market share in both domestic and foreign markets.[17] In Brazil, the lifting of export quotas in coffee led to increased competition and production;[18] the export quotas may have shielded producers from market signals causing producers to pass over export opportunities.

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14 . See para 278 and Figure 52

15 . See para 55.

16 . See Figure 8-13. See also para 70 and 71 and Table 1.

17 . See para 124-126 and Figure 30 for discussion of tobacco quotas in the US and para 120-122 and Figures 25-27 for tobacco production in the US.

18 . See Figure 14 and para 74.

21. The telecom case illustrates how competition together with technological change has led to product and process innovation, which resulted in the creation of new industries, and led to higher demand and economic growth in many countries. The reduction of entry barriers increased competition which led to a virtuous cycle of greater investment, lower prices, and higher demand. The chemical case illustrated how, in the wake of the Asian financial crisis, foreign investment regulations were relaxed and bankruptcy laws reconsidered to facilitate restructuring in many Asian countries.[19] The studies point to the benefits of reviewing regulatory regimes, especially ones restricting entry and exit, to ensure that growth opportunities are not passed over.

22. In the area of goods, market entry restrictions can take such forms as regulatory barriers, import licensing and/or investment restrictions. Some of these issues are to some extent addressed by various WTO Agreements (Agreement on Technical Barriers to Trade, Agreement on Import Licensing Procedures, etc). In the area of services, Article VI of the GATS states that domestic regulations must be "administered in a reasonable, objective and impartial manner" and any necessary disciplines shall be developed "with a view to ensuring that measures relating to qualification requirements and procedures, technical standards and licensing requirements do not constitute unnecessary barriers to trade in services." This provision would be applicable even to entry barriers that are implemented on a non-discriminatory basis. Although work on disciplines related to domestic regulations in services is progressing, concrete progress has been relatively limited until now. Having clearer disciplines in this area may facilitate future structural adjustment by facilitating market entry in the area of services.

State-Owned Enterprises (SOEs) in certain sectors may delay the structural adjustment process

23. State ownership may be considered an extreme form of domestic regulation which reserves certain sectors of the economy to the state and is a policy tool that affects trade and investment. In many countries, both developed and developing, state-owned enterprises (SOEs) have played a direct role in the economy in certain industries such as telecommunications or petrochemicals.

24. While SOEs may be seen as successful in achieving certain government objectives, they may not necessarily respond to market signals in the same way as private firms in a competitive market. If state-owned enterprises are slow to respond to changing markets, they may delay the structural adjustment process. Experience has shown that SOEs may also be subject to political pressures, e.g. to abstain from workforce reduction. This may especially be the case where top positions in state-owned enterprises are appointed by politicians. Political pressure to maintain employment in petrochemicals in some countries in Europe and Mexico were examples of such constraints.[20] Moreover, if employees in SOEs are granted strong employment protection, as is the case in the telecommunications sector in many countries, this may negatively affect incentives to adjust at the worker level.

25. An important lesson emerging from the petrochemical industry is that state-ownership, especially in an industry lacking competition, may have detrimental effects on structural adjustment. Easy access to government funding may have allowed SOEs to continue to invest even in the face of over-capacity.[21] In the case of petrochemicals in Mexico, state ownership may have been one of the reasons for under-investment or delays in investment.[22] Privatisation may be a part of the answer as could be seen in the fact

19 . See para 277-279.

20 . See para 289 -292 and Table 22 for example of Mexico. According to Greco (2004), political control of placement decisions for management personnel was one of the major reasons for over-manning in state owned enterprises in Italy..

21 . See para 255 for Chemicals in Europe. See also footnote 34.

22 . See para 290.

that partial privatisation of telecommunications companies in Morocco and Argentina resulted in new investment and rising subscriber levels. However, as noted in Bertero(2002), privatisation per se does not necessarily create the right financial incentives and should not be considered a panacea.

26. Currently, international rules related to state-ownership are quite limited.[23] The Agreement on Subsidies and Countervailing Measures, which provides rules on subsidies also cover SOEs. Thus, financial contributions by a government to an SOE may be prohibited in certain cases and may be subject to countervailing duties. To the extent that state-owned enterprises in certain sectors impede structural adjustment and may lead to potential cross border problems, there may be a case to reconsider rules in this area perhaps in conjunction with rules in the area of subsidies.

(3) Role of the Public and Private Sectors: Facilitating Entry and Exit

While the private sector remains the main player in structural adjustment, governments also have opportunities to play a constructive role.

27. As emphasised in OECD (2005), the private sector -- firms and individuals -- are the main drivers of the structural adjustment process. Government may also be important, especially in areas where there is state ownership (as in some cases regarding petrochemicals and telecommunications), or where there are existing government regulations which place direct restrictions on entry to or exit from a certain sector (tobacco farming in the US,[24] telecommunications and chemicals when subject to strict investment regulations) as stated in the previous section. Indeed, in such cases government action may be a prerequisite for structural adjustment.

28. The government also may play a key role by providing a broad policy environment that is conducive to market entry and exit, which is the heart of the adjustment process. The European chemicals case illustrates how changes in competition policy in response to the Single European Market opened the way for the mega-mergers. The Tanzanian coffee case illustrates a counter-example where lack of institution building may have kept Tanzania from fully benefiting from market liberalisation.[25]

Direct government intervention in the structural adjustment process needs to be handled with care

29. While direct government intervention may be warranted in some cases and may facilitate adjustment, it can lead to an inefficient outcome. Although it would be desirable for inefficient players to reduce production or exit the market, governments often choose to promote reduced production industry-wide on a pro rata basis, in order to avoid choosing among producers. While this may facilitate partial adjustment, such solutions penalise efficient producers and allow inefficient producers to stay in the market.

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23 . Examples are (i) GATT Article XVII on state trading enterprises (STE), which provides that STEs are to act in accordance with the principle of non-discrimination and that purchases and sales are made in accordance with commercial considerations, and (ii) GATS Article VIII on Monopolies and Exclusive Service Suppliers, which ensures that monopoly positions are not abused to negate specific obligations made in the GATS.

24 . It should be noted that the US tobacco quota system did allow for “lease and transfer” of tobacco quotas within counties.

25 . Before market liberalisation, Tanzania was able to control quality effectively as the Tanzanian Coffee Marketing Board had complete control of the marketing chain. However, it failed to put in place the necessary institutions for quality control in a liberalised market. Thus, quality control procedures, although they existed on paper, were rarely enforced, leading to a general deterioration of quality. See also para 91-94 for discussion on coffee in Tanzania.

30. The petrochemicals case in Japan illustrates this point. Japan successfully reduced capacity in petrochemicals in the 1980s through pro rata reductions. However, government intervention had major drawbacks: The reductions delayed the consolidation of the industry by preserving inefficient players, may have amplified over capacity problems later on,[26] and may also have led to some moral hazard problems in subsequent periods as industry took a "wait and see" attitude. Such government actions may also have negative effects on other industries if it establishes a precedent.

Subsidies or other governmental action, to minimise social dislocation should be transparent and time bound.

31. Governments use various types of subsidies or financial incentives to influence private sector activities and to achieve policy objectives. For example, regional subsidies may be used to achieve more geographically balanced development. Government intervention and subsidies may be considered desirable to provide compensation or to minimise social dislocation related to structural adjustment. Subsidies may also be used to cushion producers from short-term problems, like low prices in a cyclical market. However, subsidies should be approached with caution as they may have unintentional side effects.

32. Regional subsidies provided to some companies in the European petrochemical industry were perceived to be at least part of the reason for the "excess capacity" in the 1980s.[27] Regional subsidies, if provided on an ongoing basis to producers, allow inefficient producers to survive, and numb even efficient producers' ability to sense change and to adjust to changing market conditions. The subsidies may also cause trade problems by exerting additional competitive pressures on other producers both at home and abroad. Regional subsidies by their very nature, will have a geographically limited scope and would be actionable under the SCM Agreement.

33. Subsidies to provide compensation or to minimise social dislocation related to policy reform should be used with care. Where there is a policy-induced change as opposed to a market-based change, there may be a stronger case for compensation as the former is something that is induced by government action. Governments are recommended to rely, wherever possible, on generally available measures of adjustment costs (OECD2005), but some targeted measures may be considered necessary on a case by case basis. A paper by the Productivity Commission of Australia states that the case for measures to compensate for policy-induced change would be strongest from equity and fairness grounds "if a reform: will impose a clear and sizeable burden on a specific group (particularly if the affected group is relatively disadvantaged); delivers benefits mainly to relatively advantaged groups; or involves a largely anticipated and material change to a well defined and defensible 'property right')" (Productivity Commission 2001).

34. The EU and US tobacco case were cases where compensation packages were put in place to assist individuals whose wealth was in part based on the quota.[28] Reductions in these quotas could be considered as changes in defensible property rights, which may fit the above criteria. Such compensation was likely considered necessary to gain political support for reform. However, it should be noted that there is a risk of creating a general precedent of compensating beneficiaries who lose as a consequence of any changes in government policy. All changes in government policy create both winners and losers. Expectations for compensation once built up may make structural adjustment in other sectors more

26 . As capacity reductions were calculated based on existing capacity, companies had an incentive to maintain old capacity and make investment decisions quickly for fear of being precluded from making those investments at a later date. See para 262-264 for Japan's experience in ethylene capacity reduction.

27 . See para 255, Box 14 and para 266 for discussion on subsidies in Europe.

28 . See para 135 - 138 for description of the US Tobacco buyout and para 147 for the new EU policy on tobacco.

difficult. It may also have the perverse result of inducing potential beneficiaries of compensation to lobby harder against policy reform in order to increase the amount of compensation.

35. Government intervention and subsidies may also be used to minimise social dislocation by delaying structural adjustment; e.g. by rescuing and restructuring firms in difficulty. However, care is necessary as "aid for restructuring purposes raises particular competition concerns as it can unfairly shift the burden of structural adjustment on to other, more efficient producers who are managing without aid"(EC 2005). Unnecessary delay of the structural adjustment process may also lead to greater and more difficult adjustment later on. In chemicals, countries such as the US who have left adjustment to market forces, while experiencing some falls in employment, have recovered relatively quickly.[29] Some countries who delayed structural adjustment seem to have experienced longer periods of structural adjustment with greater falls in employment in the end.[30]

36. Governments sometimes grant subsidies in order to cushion producers from short-term problems like low prices. However, care is needed to ensure that the nature of the problem has been correctly assessed and that this type of subsidy is indeed an appropriate response. Subsidies to solve short-term problems are unlikely to provide solutions to underlying long-term structural change. For example, direct payments provided to coffee producers in Central American countries may have been an appropriate governmental reaction if low coffee prices were a cyclical phenomenon. However, if this were not the case and low coffee prices represented a structural change, these subsidies may have the unintended effect of keeping producers in coffee production and benefit certain producers over others.[31]

37. The fact that subsidies may distort trade and investment is widely recognised. The Agreement on Subsidies and Countervailing Duties defines three categories of subsidies: prohibited, actionable and non-actionable subsidies. Export subsidies and subsidies which are contingent on use of domestic over imported goods are prohibited with some limited exceptions,[32] and if found to exist they must be withdrawn. Actionable subsidies may be subject to WTO Dispute Settlement or to the imposition of countervailing duties if found to cause serious prejudice or injury to the domestic industry of another Member. Article 8 defining non-actionable subsidies have become non-operational in accordance with Article 31 of the SCM so all the above mentioned subsidies will be considered actionable. Certain subsidies have also been subject to "non-violation" claims under GATT Article XXIII (b). [33]

38. However, the effectiveness of current multilateral rules may be limited as it is often difficult to have subsidies removed through the WTO Dispute Settlement Mechanism. Moreover, countervailing duties may not be practical if the results of "excess capacities" do not result in the increase of imports, but rather result in depressed international prices, loss of exports, etc. Subsidies for firms in financial distress may be detrimental if as a result of subsidies, the less efficient but subsidised firms survive while more efficient firms that are not subsidised are forced to exit.

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29 . See para 246-253 for discussion on restructuring of the chemical industry in the United States.

30 . See para 255 and 261. See also Box 14.

31 . See para 78-82 for description of adjustment policies in Central America.

32 . For example, Article 13 of the Agreement on Agriculture for agricultural products and Article 27 for some developing countries

33 . In an adopted GATT panel report EEC Oilseeds I, the Panel found that benefits accruing to the United States were impaired by "introduction of production subsidy schemes which operate to protect Community producers of oilseeds completely from the movement of prices of imports" and prevented "tariff concessions from having any impact on the competitive relationship between domestic and imported oilseeds". The panel recommended that "the CONTRACTING PARTIES suggest that the Community consider ways and means to eliminate the impairment of its tariff concessions for oilseeds".

39. There may be a case to consider additional multilateral rules in this area;[34] in this case, some differentiation between developed countries and developing countries may be warranted as developing countries' economies are less diversified and markets are less developed. However, experience has shown that subsidization policies which shield industries from competition for extended periods are not an effective economic development tool. Therefore, provisions on special and differential treatment for developing countries should be viewed as temporary deviations from the normal disciplines necessary to promote trade liberalization and growth, and should only be invoked to the extent necessary and consistent with an individual country's particular economic, financial and development needs.

Decentralisation of adjustment policies have its pros and cons

40. Structural adjustment policies that limit adjustment costs for all groups that are severely affected would be preferable. However, because of the differential effects of structural reform, it is often difficult to pre-define the effects of structural adjustment on any given group, and a single policy (or group of policies) may not always be possible. In these cases, a realistic approach may be to move ahead with reform while providing flexible and disaggregated adjustment policies. Aid at sub-national levels may have the advantage of being based on local information about the precise locally-based changes and allows for more targeted policies. Some support payments in the case of U.S. tobacco may be examples of this dis-aggregation of assistance.[35] As is the case with national policy, these structural adjustment measures must be time-bound, with a clear exit strategy. Care is needed to ensure that adjustment aid at sub-national level does not conflict with structural adjustment policies at the national level as they may also slow down the structural adjustment process.

Public-private partnerships may be effective in a world of imperfect information and market imperfections

41. One of the differences between developed and developing countries, as between large companies and individuals, lies in their ability to analyse structural changes. Although information technology has greatly enhanced the ability to accumulate information, each individual worker, firm, or country must analyse the effects of changing trends on one's own economic activity. The ability to do this analysis may vary. If economic players detect change only when the effects are clear and apparent, it may be too late, and resources may have been wasted in unproductive activities.

42. Governments and international and national industry associations may play a constructive role in analysing the implication of structural trends to an industry/country. This is because firms and workers are better able to adapt to the changing environment if they have a better idea of how the environment is changing and how it is expected to evolve. This could be seen for example in the policy dialogues throughout the structural adjustment planning process for US tobacco[36] and in the role of the Association of Petrochemical Producers in Europe (APPE) in the chemicals industry in Europe.[37] Analysis of markets through public-private dialogue may be helpful in alerting industry and workers of structural change, as well as facilitating a better understanding of markets by the government. The process may be just as important as the resulting analysis. Market projections coupled with direct intervention may have negative

34 . Bertero (2002) has argued that a supranational institution may have the effect of imposing financial discipline on governments and state-owned enterprises operating in a soft budget regime through a case study analysing the effect of European Commission policy on the budget regime in Italy.

35 . See para 131 for description of direct payments to farmers at the state level under the Master Settlement Agreement in the US tobacco industry.

36 . See para 115-143 for the US tobacco case.

37 . See para 259.

consequences.[38] The public-private partnerships in Brazil tobacco and the work of the agricultural producer associations in the tobacco case show that structural adjustment can be assisted not only by the government but by the active participation of the private sector and NGOs.[39]

Foreign direct investment may facilitate the structural adjustment process by providing capital, new technology, access to foreign markets, and information on the global market

43. In most cases, foreign direct investment (FDI) has played a key role in the restructuring of industries in both developed and developing countries.[40] Multinational enterprises have facilitated structural adjustment through international transfer of technology, capital, managerial expertise and marketing know-how. One thing worthy of note is that investments from developing countries to developed countries may also be beneficial for structural adjustment. Acquisition of Western European companies by Middle Eastern chemical companies allowed Middle Eastern companies to acquire technology and gain market footholds while allowing European companies to focus more on growth areas such as specialty chemicals.[41]

44. FDI has played a role even in agricultural sectors such as tobacco. For example, the FDI from Philip Morris is providing new opportunities for tobacco production in its India partner: through the potential development of new hybrids, quality improvements and higher yields. Philip Morris is also benefiting from their partner in India because of access to a new variety that better meets consumer demand. FDI has helped to link developing country producers with developed country markets. This linkage has been mutually beneficial for both parties so that both could capitalise on the new opportunities of the changing tobacco market.[42]

(4) Possible Lessons on Sequencing and Pace of Policy Reforms

45. As stated in OECD (2005), while no single blueprint for sequencing exists, the cases point to some possible lessons on the sequencing and pace of reform. While it is necessary to bear in mind the uniqueness of sectors and the general context under which the structural adjustment takes place, it may have some implications for other sectors.

Attention to sequencing of reform may lead to better results

46. The case of telecommunications services illustrated that a country's success in establishing competitive markets was dependent on the sequence of implementing reform measures.[43] Three main elements of reform were identified in the telecommunications services sector: privatisation, introduction of competition and establishment of an independent regulator. While it is possible to pursue one or the other sequentially, several studies show that all the elements of reform are mutually reinforcing. Competition is the most effective agent of change, acting as a spur to innovation and strengthening firms' incentives to adopt best practices and respond to customer needs. It could also lead to the reduction of rents and

38 . The case of petrochemicals in Japan in 1980s may be a case of direct government intervention. See para 29-30 and para 262-264.

39 . See para 153 for public –private partnership in Brazil tobacco.

40 . See para 252 for US Chemicals, para 260, 265 and 267 for Europe, para 278 and para 279 for Asian countries. For telecommunications see para 211-213.

41 . See para 260.

42 . See Box 9.

43 . See para 214-219 for further discussion on sequencing in the telecom sector.

increase of consumer surplus. Establishment of an independent and capable regulator is key to introduce effective competition. Privatisation without effective regulation has not necessarily improved service levels but the establishment of independent regulatory authorities prior to privatisation has had a positive effect on investment in infrastructure, telephone penetration and the stock market valuation of incumbents.

47. Countries which have awarded exclusivity contracts to former incumbents following privatisation have suffered from a relatively slow growth in subscriber levels. A reform process in which an incumbent is given too much time to "adjust", or consolidate, often strengthens the incumbent's market power. Effective change has best been achieved when competition has been introduced directly to the core business, as in fixed line services, rather than solely to adjacent areas, such as mobile services. Greater market openness encourages expansion of telecommunications networks at lower cost, while improving the efficiency of incumbent operators and lowering the costs of services to ICT-using sectors.

A policy reform roadmap may ease the adjustment process by facilitating changes in resource allocation.

48. It is worth restating that gradual reforms which follow a roadmap for policy reform may facilitate resource reallocation by economic actors, and thus ease adjustment pain. The case of the telecommunications sector illustrated how pre-commitments made in the WTO served to smooth adjustment.[44] Policy dialogues may help in acceptance of reform, as was illustrated in the cases on Japan chemicals and US tobacco.[45] However, if reforms are too slow, and especially where there are indications of uncertainty in the direction and timing of reform, this may impede resource reallocation. In the US tobacco case, indications of a quota buyout may have led to keeping some policy beneficiaries in the industry longer than would have been optimal for the producers or the government.[46] In the case of petrochemicals in Mexico, uncertainty related to the treatment of Pemex may have led companies to defer investment until there was greater clarity in the regulatory framework.[47]

Liberalising input sectors may be important to allow smooth adjustment of output sectors.

49. Liberalising output sectors while maintaining trade and investment restrictions on inputs may be tantamount to forcing output sectors to face international competition with one hand tied behind their back. Thus there is a case for liberalising intermediate goods and capital goods before finished goods[48]. The Vietnam coffee case provides an example where liberalising inputs, i.e. fertiliser, contributed to the smooth expansion of an output sector, i.e. coffee. Access to cheaper inputs allowed state-owned enterprises to increase production and exports rapidly, paving the way for subsequent participation of the private sector.[49] This sequencing may have been one of the keys enabling Vietnam to realise rapid growth in coffee exports. In a similar manner, liberalisation of the chemical sector in China may have been one factor contributing to the high growth in exports of plastic products.[50]

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44 . See para 186-187 for Argentina's experiences in the telecommunications sector.

45 . See para 263 for Japan chemicals, and para 133 and 134 for US tobacco.

46 . See para 133-143 for discussion on US tobacco.

47 . See para 290 – 292.

48 . Hoj et al. (2006) states that there is some evidence that reforms are relatively easier and more successfully implemented in sectors producing intermediate inputs to other industries as compared with sectors mostly producing final consumption goods.

49. See Para 84-87 for Vietnam coffee. As noted in the case study, the increased use of chemical fertilisers may have generated some environmental costs.

50 . See para 282, Table 18-19 and Figure 53.

50. While access to competitive intermediate goods and capital goods are thus important for competitiveness of exporting sectors, it should be noted that if such liberalisation takes place while leaving finished goods highly protected, this may lead to an increase of effective protection in the finished good. In such a case, production in the finished good would expand while on efficiency grounds their contraction may be called for.

FDI facilitates structural adjustment and parallel liberalisation of trade and investment has substantial merits. A well-functioning financial market also facilitates structural adjustment,

51. As we saw in the previous section, FDI has facilitated structural adjustment in all of the cases studied. Considering the role FDI played in the restructuring process, there seems to be considerable merit in liberalising trade and FDI simultaneously. Trade liberalisation without investment liberalisation may lead to lost opportunities in domestic production through FDI. The example of petrochemicals in Mexico where certain petrochemicals were reserved only for Pemex may have led to under investment in certain petrochemicals, triggering an increase in imports.[51]

52. The US chemicals case showed how an efficient financial market can facilitate structural adjustment. Stronger monitoring by equity markets can promote structural adjustment through more efficient use of capital.[52] Access to efficient financial markets will allow domestic companies to tap foreign capital markets as necessary, and put them on an equal level playing field with foreign competitors. While the effect of the financial crisis on the chemical sector in Asia may suggest that premature capital liberalisation has its dangers, it should be noted that liberalisation of FDI without allowing domestic companies to tap foreign capital may have the effect of disadvantaging domestic companies.[53]

51 . See para 289 - 292.

52 . See para 248 - 249.

53 . See para 277 - 279.

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PART 2: SECTORAL CASE STUDIES

1. COFFEE

Executive Summary

Introduction

This case study reviews the experiences of coffee producers and how their governments are assisting them through long-term changes in the coffee market. During the 1990s, the effects of dismantling the International Coffee Agreement (ICA) and national coffee boards, the increase of Brazilian coffee supply, the entrance and dominance of Vietnam as a leading coffee producer, changes in consumer preferences and technology, among others were the structural changes that affected the industry. Between 1999 and 2002, the price of coffee had fallen to 100-year lows. The coffee crisis, as it has been called, caused short-term damage to many coffee-producing countries. The coffee crisis is indicative of a structural change in the industry: raw (or green) coffee, like most unprocessed commodities, has a long-term declining market value. And like many raw commodities, coffee is mainly produced in developing countries for developed country markets. In this case, we review **Brazil**, **Vietnam** and **Central America** (**Costa Rica**, **El Salvador**, **Guatemala**, **Honduras** and **Nicaragua**) because they are the largest producers of coffee. Additionally, we consider **East Africa** (**Kenya**, **Tanzania** and **Uganda**) because of the significance of coffee in most of their economies.

Key Points

- In the midst of the coffee crisis, several **Central American** countries instituted a direct payment scheme to help coffee producers adjust. Direct payments are "green box" policies under the Agreement on Agriculture (AoA) if the policies are not directly related to market conditions (prices, area planted or crop). Some monies have been set aside to encourage producers to leave the industry. For some of the **Central American** governments, the support provided during the coffee crisis was contingent on families keeping their children in school.

- However, subsidies may have the unintended effect of encouraging producers to stay in coffee production, which may slow the structural adjustment process.

- Countries like **Brazil** and some in **Central America** have encouraged producers to deal with structural change via more market-oriented approaches than direct payments. **Brazil** has developed a government-subsidised risk management programme, using financial instruments like put options.

- The **Central American** case points to the issue of labour mobility. Initially, the landless, coffee harvesters were believed to face the greatest difficulty during the coffee crisis, but because of the general economic growth, many of the redundant harvesters were believed to have found employment

outside of coffee production. On the other hand, small scale farmers had a greater problem adjusting because they were unable/unwilling to sell land/farming rights and move to other areas of economic activity.

- Policy sequencing was one of the key aspects of the success of the policy reforms in **Vietnam**. In the Vietnamese agricultural sector, input markets were deregulated relatively early compared to the output market. Liberalisation of the input market permitted imports of chemical fertilizers, which were less expensive than domestic organic fertilisers. The export producing sector became more profitable; however, the change in fertilisers may have generated some environmental costs.

- Before 1989, the economic components of the plurilateral International Coffee Agreement (ICA) consisted of export quotas that were distributed to member countries. In many countries, national marketing boards were put into place to enforce these quotas. The quotas may have contributed to higher international coffee prices. However, the rent-seeking behaviour associated with the quotas, as has been identified in coffee-producing countries, may have dissipated the benefits to producers.

- With the termination of the export quotas of the International Coffee Agreement, **Brazil**, as well as other coffee-producing countries, deregulated the coffee market by eliminating national marketing boards. Some researchers have argued that quality may have been hurt by the deregulation, as may have been the case in **Tanzania**. Others argue that deregulation led to more efficient domestic markets, which granted producers a greater share of the coffee border price. The deregulation also encouraged FDI as in **East Africa** in terms of new coffee purchasers.

- Some of the issues related to structural adjustment policies are ones considered by the Doha Ministerial Declaration. Many coffee producing countries, with the notable exception of **Brazil**, have not moved up the supply chain substantially to processed coffee products (roasted beans, soluble coffees, etc.) One of the potential hindrances is tariff escalation for more processed coffee products.

- A potential solution to low coffee prices is a move further up the supply chain with specialty coffees (flavoured, fair trade, organic, bird-friendly, etc.) and the use of geographic indicators for product differentiation. Specialty coffees may offer some producers access to potentially higher prices. As the niche market becomes part of the mainstream market and large multinationals adopt similar strategies, the long-term prospects of specialty coffees are uncertain. More fundamentally, for these strategies to work, the appropriate infrastructure and investments must be in place to access higher valued markets.

- Some studies show that marketing margins kept in developed countries have increased in recent years. The experience of East African countries may point to the importance of an effective competitive market in order to ensure that coffee farmers are able to receive a fair share of the proceeds. The experiences also show that improvements in institutional arrangements, transportation infrastructure and information may contribute to this end.

Background

53. From 1999 to 2001, the price of coffee reached a 100 year low (Osario, 2002). Market observers have called this period the "coffee crisis." The uniqueness of this period partially obscures the larger issue, declining world prices for agricultural commodities. At the same time, the crisis brings to light the plight of countries dependent on these commodities. The coffee crisis is our departure to look at the broader issue of declining agricultural prices in the context of structural change and adjustment.

54. Coffee is a "soft" tropical agricultural commodity, like cocoa and tea. These commodities tend to be produced in developing countries and consumed in developed countries. Coffee, like the other soft commodities, has experienced declining terms of trade and price volatility. In a country with a diverse economy, the resulting low and risky returns to a single commodity may not generate problems, but for agricultural commodity-dependent developing countries (ACDDCs),[54] low and risky returns generate substantial problems not only for the producers of the commodity, but their communities and the economic well-being of the country (DFID, 2004). It is in this light, that understanding structural adjustment of a soft commodity such as coffee is not only useful but vital for developing countries.

55. The level of dependency varies widely by country. Consider the assessment of Hallam (2003) during the height of the coffee crisis, "While some traditional coffee exporters such as Brazil have diversified and reduced export dependency on coffee—from more than 40% in 1960 to less than 5% today—dependency remains a major problem, especially for poor African countries: Burundi derives nearly 80% of export earnings from coffee; Uganda and Ethiopia more than 50%; and Rwanda slightly less than 50%. A number of Latin American countries also have high dependency on coffee, notably Colombia and El Salvador where coffee has accounted for around 15% of export earnings, and Guatemala, Honduras and Nicaragua with around 20% of export earnings. Export dependency is also reflected in significant shares of employment related to coffee: in Colombia for example 30% of the rural population is directly dependent on coffee. Such dependency means that coffee price variations have significant multiplier effects on employment and incomes beyond production itself in related upstream and downstream industries and across the economy in general." (p.7)

The Coffee Crisis

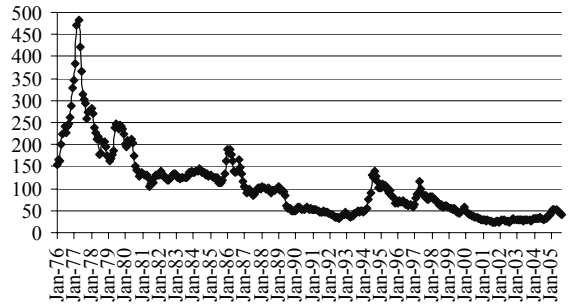
56. The dependency of countries on a single commodity, such as coffee, is significant in a market environment of price fluctuations where there are booms and busts. However, the current price declines of coffee are fundamentally different. Observers of the coffee market have described the low prices the "coffee crisis." In the early 1990s export earnings for coffee were around USD 10 000 to 12 000 million, and retail sales of coffee largely in industrial countries was USD 30 000 million. World market prices averaged around USD 1.20 per pound in the 1980s fell to below USD 0.50 in 2000s, the lowest in real terms in 100 years (Osorio, 2002). In a four-year period, the price had fallen by 82% (see Figure 1). Oxfam reports the work of Landell Mills Consultants, which stated that the price of coffee at the end of 2001 was too low to cover even the variable costs. In a study for TechnoServe, McKinsey & Company states "…while the coffee industry has undergone crises in the past, the current situation is more fundamentally damaging to many coffee producers who are not profiting now—and their workers." (TechnoServe, 2003, p.2) The price declines for producers have been much greater than the declines for

54. Agricultural commodity-dependent developing countries are "defined as being those countries which are more dependent on agricultural commodity exports and specialise in producing one or a few commodities." (DFID, p7, 2004)

retailers (Fritsch, 2002). As seen in Figure 2, the marketing margins[55] in Germany, France and the US have increased over the last 30 years. Daviron and Ponte (2005) juxtapose the coffee crisis to the coffee boom in consumption (the rise of international coffee house or cafés, specialty and flavoured coffees, etc.) and describe the crisis and the boom collectively as a "coffee paradox."

57. The current price decline is different from previous price declines. Figure 1 clearly shows that current prices are fluctuating at a much lower price than previous years. The price cycle is oscillating around a much lower average, an average where many producers are not able to cover costs. The coffee crisis is indicative of the long-term, downward trend in the price of coffee. Some researchers argue that there has been a fundamental, structural change in the market for coffee. The dismantling of the International Coffee Agreements (ICA) and national coffee boards is sometimes considered as one of the contributing factors as will be discussed later. Increased production from the large players Brazil and Vietnam, improved efficiency and better incentives through market liberalisation have led to oversupply, while over the same period, world demand measured as imports has grown only 1% to 3%, a mismatch compared to the growth of exports. In addition, Scholer (2004) notes that there has been a shift in bean usage, an evolution in the type of coffees consumed, new technologies, etc which have affected demand negatively.

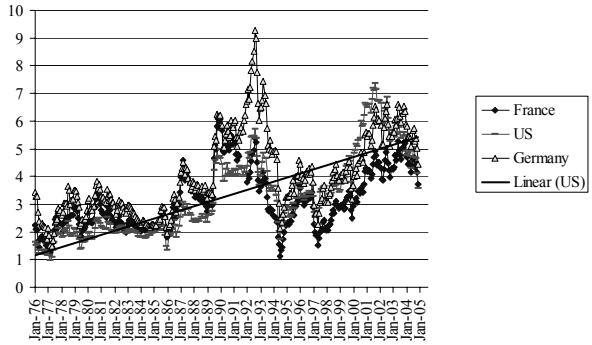
Figure 1. ICO composite indicator prices for coffee



1. ICO composite indicator price is a market-share weighted average of different coffee varieties in USD in cents per pound of coffee 1982-84=100

Source: ICO, 2006a

Figure 2. Retail prices relative to ICO composite indicator price



Source: Author's Calculations

Global Demand Issues

58. As a soft commodity, coffee continues to be consumed mainly in developed countries. However, growth of coffee consumption has been slow in the more mature markets like the US and Western Europe. Figure 3 shows that the US, Germany, Japan, France, Italy and Spain are the largest importers of coffee and make up between 57% and 63% of total world imports of bean coffee.[56] These countries have

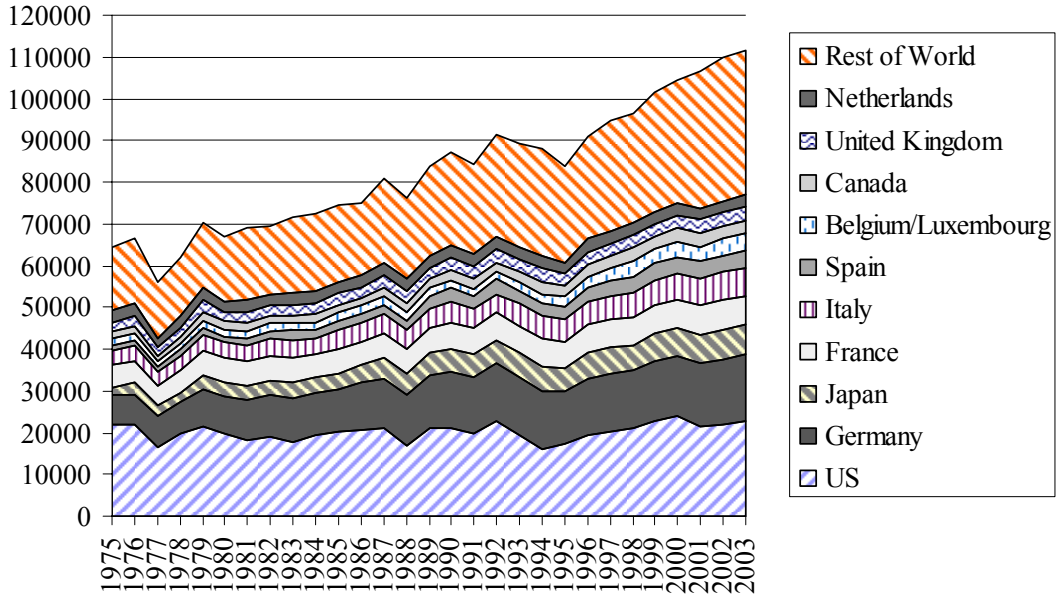
55. The marketing margin is the price difference between the prices that producers receive and the retail prices that consumers pay. In the marketing margin used here, the producer price is the ICO Index Price and the retail price in each of the countries listed.

56. Lewin, Giovannucci and Varangis (2004) report that 65% of world coffee consumption is from 17% of the world's population, and emerging markets offer a prospect of future growth. However, these markets tend to consume lower-quality product relative to the more mature markets. Of the coffee producing countries, only Brazil and Ethiopia are major consumers of coffee.

increased their total consumption of coffee, but other countries are increasing their consumption at greater rates, particularly Eastern Europe and non-OECD Asia (Lewin, Giovannucci and Varagis, 2004).

Figure 3. Coffee imports

1 000 60 kg bags



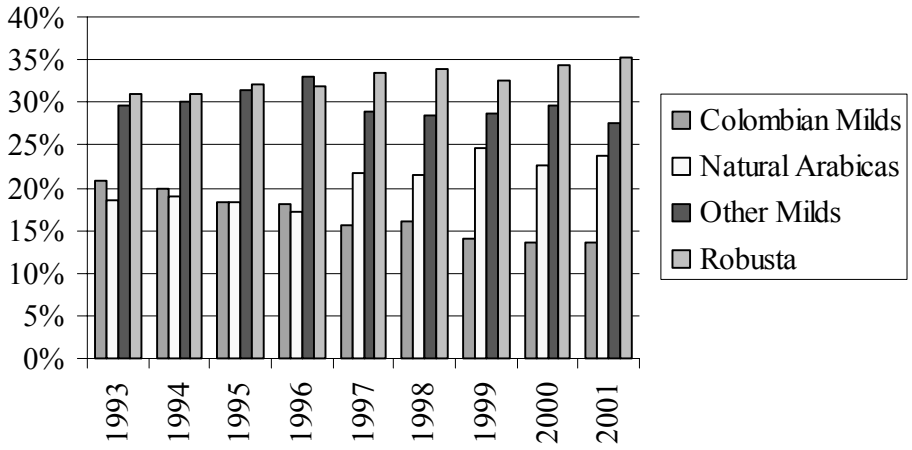
1. Some importers may have been omitted from the Rest of the World

Source: ICO, 2006a

59. An evolution in the type of coffees consumed, a shift in bean usage, and new technology are some of the factors that have had a negative effect on prices. For example, consumers' tastes have changed by moving from brewed or percolated coffees to espresso-type drinks, flavoured coffees, soluble coffees and ready-to-drink products. These products permit greater blending of coffee (higher and lower quality) varieties. The result ultimately puts downward pressure on the demand for higher quality varieties (Scholer, 2004). The shift in bean usage is mostly a movement away from Arabica to Robusta coffee beans. The production of Robusta beans has grown faster relative to Arabica beans increasing its share(see figures 4, 5 and 7). [57] Generally speaking, Arabica coffee is considered a higher quality coffee, with less caffeine and a higher price compared to Robusta. As consumers are believed to have a maximum caffeine consumption level, the greater use of Robusta beans may have induced a lower consumption of coffee or at least slowed the growth of consumption (Scholer, 2004). Technological advances in blending techniques have permitted use of lower quality coffees beans without compromising final product quality (within and across varieties). Also, technology advances have enabled manufacturers to use fewer beans, especially in ready-made products that are becoming popular.

57. Columbian and Other Milds are types of washed Arabicas from Central America, Colombia, most of East Africa and South America. Natural Arabicas are unwashed coffee beans mainly from Brazil, Ethiopia and Paraguay. See the Appendix for a more detailed catalogue of coffee types and countries of production.

Figure 4. Shares of use by importers



Source: Lewin, Giovannucci and Varangis, 2004

60. Another factor that may have contributed to the long-term price declines has been the growing power of traders, roasters and retailers, who may have exerted downward pressure on prices. In 1998, coffee traders Neumann and Volcafé controlled 29% of the market. In the 2000s, mergers and acquisitions have made the market even more concentrated amongst traders. At the roaster level, Nestlé and Philip Morris control 49% of world market share for roasted and instant coffees, while the top five companies control 69% of the market (Daviron and Ponte, 2005). Lewin, Giovannucci and Varangis (2004) suggest that supermarkets have increased influence on the demand for coffee.

61. In particular, researchers argue that the retail price has responded in a limited manner to the price falls of unprocessed or green coffee (see Figure 2, which shows that marketing margins have increased even though both retail and producer prices have fallen). Lewin, Giovannucci and Varangis (2004) state "Part of the explanation may also involve increased profits by retailers, but another part of the explanation is that a number of costs in the coffee chain, including transport, processing, and packaging have remained stable or increased, and these now represent a greater part of the final retail value of coffee." (p. 39) One retailer/roaster noted that coffee represents about one-third of the costs and that a 30% drop in the international price of coffee could lead to only a 10% decline in the price of coffee that the company charges the customer (Wasserman, 2002).

62. Another reason for the price spread is high transaction costs. Winter-Nelson and Temu (2002) note that the large marketing margins are because of poor physical infrastructure or mismanagement which leads to high costs in transforming the coffee through space, form and time or because of poor institutional infrastructure which implies high costs to developing, negotiating or enforcing contracts and/or gathering information. This argument focuses on the local market/supply chain for coffee. On a global basis, international institutions and regulations also influenced the market for coffee as will be discussed later.

Global Supply Issues

The Commodity Problem

63. Coffee is estimated to have a supply elasticity of around 0.25 (Hallam, 2003). The low elasticity is partly the result of the perennial nature of coffee plants: three years after planting, coffee trees begin

producing coffee and can do so for 15 to 25 years (Minot, 1998). Coffee plants must be harvested every year to maintain their ability to produce. Therefore, in times of changes in the coffee price, producers have a difficult time adjusting production. For example in periods of rising prices, producers invest more in new plantings and other fixed assets, which are not easily removed or divested in times of low prices and may only be removed at the end of the life of the investment (Hallam, 2003). Exacerbating the difficulty of the sluggish supply response to low prices, governments often grant subsidies to help producers and communities, but these subsidies may also discourage producers from making adjustment in their long-term investment decisions (Wasserman, 2002).

The Dominance of Three: Brazil, Vietnam and Central America

64. Lewin, Giovannucci and Varangis (2004) argue that there is a paradigm shift in coffee production caused by the dominance of three producers: Brazil, Vietnam and Central America.[58] From 1975 to 2004, these countries increased exports by 190%, while the rest of the world increased exports by only 6.4%. The researchers note that in 1992, another year of relatively low prices, the three countries produced over 40% of the world coffee supply. In 2001/02 crop year, a year of the lowest prices in over 30 years, the three countries produced nearly 60% of the world supply (see Figure 5). Lewin, Giovannucci and Varangis (2004) continues, "…this [market share] is likely to increase unless production in other countries significantly reverses its decline." (p. 6)

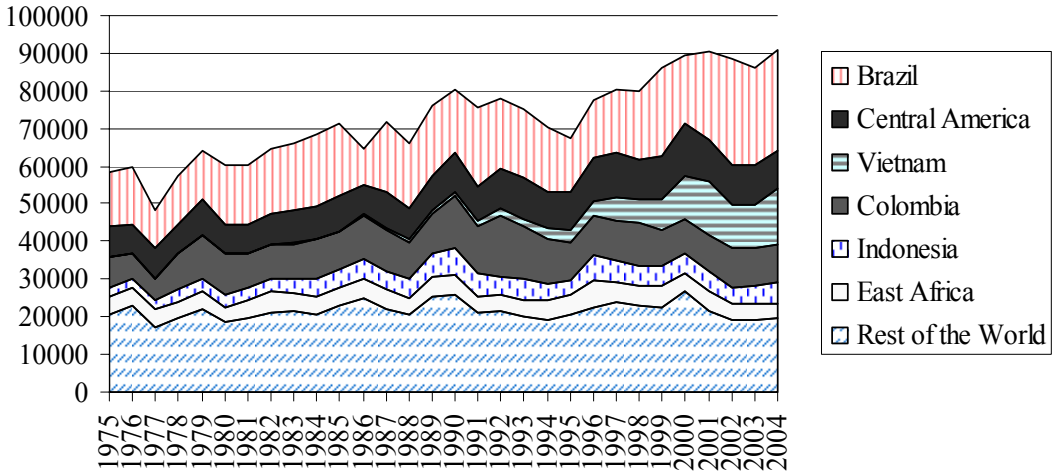
65. Brazil has been able to expand its production (and even move into other coffee varieties) because of its technological advances (in production, harvesting and processing), movement of production from frost-prone areas and increased irrigation (Baffes, Lewin and Varangis, 2004). Of the three producers, many blame Vietnam's substantial increase in production for the price decrease.[59] In the 1980s, Vietnam was producing less than 0.5% of world coffee supplies. By 2000, Vietnam was producing over 10% and was the second largest producer in the world. Vietnam and Brazil are the top producers of Robusta coffee (see Figure 5 and 7). The coffee exports of Central America increased over this period such that the exports of Central America surpassed those of Colombia.

58. For this case study, Central America consists of Costa Rica, El Salvador, Guatemala, Honduras and Nicaragua. On a per country basis, Columbia is the third largest producer of coffee; however, we consider Central America because of the overall size of the region and the amount of relevant data available for the region.

59. World Bank (2004) argues that this accusation is inappropriate given the other changes in broader market.

Figure 5. Coffee exports (1975-2004)

1 000 60 kg bags

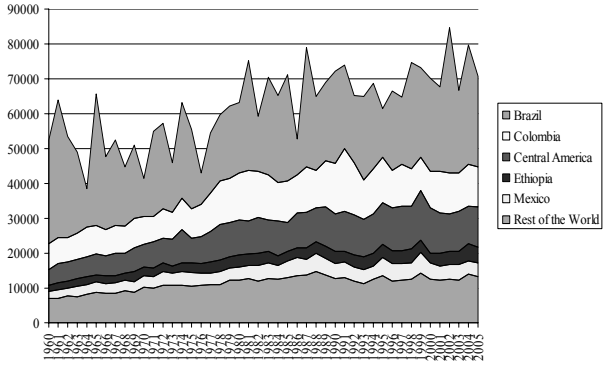


1. If an exporter was not a member of the ICO, then, the exporter is excluded from this figure.

Source: ICO, 2006a

Figure 6. Arabica production (1960-2005)

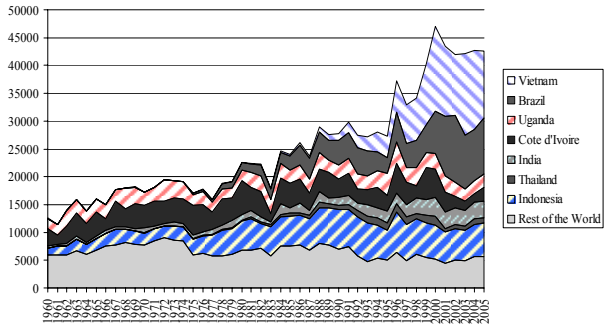
1 000 60 kg bags



Source: USDA/FAS, 2006

Figure 7. Robusta production (1960-2005)

1 000 60 kg bags



Source : USDA/FAS, 2006

International Institutions and Trade Policy

International Coffee Agreement

66. In 1962, coffee-exporting and coffee-importing countries signed the International Coffee Agreement (ICA). The ICA was one of several international commodity agreements which attempted to

stabilise the price of commodities.[60] Gilbert (1996) states, "The agreement was important because more developing countries are dependent on coffee exports than on any other single non-oil primary commodity; it was controversial because, since it operated entirely through export controls, it laid itself open to the charge of being an internationally sanctioned cartel whose objectives were primarily raising rather than stabilizing the coffee price." (p. 9)

67. The ICA used export quotas to regulate the quantity of coffee in the world market. The quotas facilitated the maintenance of the International Coffee Organization (ICO) composite indicator price (CIP) above a minimum price. The ICA adjusted, tightened or suspended the quota, if the CIP fell beyond a price bound. Additionally, the ICA had created a fund from a USD 0.60/bag levy (at official exchange rates). The ICO distributed the funds for diversification projects.

68. Studies of coffee prices are unclear on the effects of the ICA: some studies argue that that ICA helped stabilised the price (Akiyama and Varangis, 1990). Mehta and Chavas (2004) however suggest that the ICA may have exacerbated the price fluctuations over time by extending price upturns. The momentary price increase encouraged producers to make investments that matured years later, which may have been out of line with the demand by then. Bohman, Jarvis and Barichello (1996) provide evidence that for some exporters the welfare costs of the quotas outweighed the benefits because of rent-seeking behaviour in the domestic distribution of the national quotas imposed by the ICA.

69. The quota system ended when the ICA terminated the "economic clauses" in 1989. The economic clauses were terminated because countries were unable to reach consensus on the distribution of quota and it was thought that producers did not benefit from higher export prices. Coffee importing countries lost interest in the ICA because of declining quality and price discrimination between members and non-members (Gilbert, 1996). The ICA still exists today but without the quota system. Coffee-producing countries have used other methods to try to reduce price variability such as the supply retention scheme of the Association of Coffee Producing Countries (ACPC). The scheme encouraged coffee-exporting countries to retain 20% of exports to maintain the price above USD 0.95/lb. However, few countries actually abided by the retention scheme (Hallam, 2003). The ICO still provides support for diversification projects.

Tariffs

70. Import tariffs on green coffee are falling, but progressive tariffs are generally levied on processed coffee. Tariffs on soluble coffees are of main interest on this tariff escalation issue, chiefly an issue for Brazil (see Table 1). As Table 1 and Figures 8-11 show, in OECD countries on average, the difference between tariffs, by level of processing, especially for countries eligible for GSP status is falling. Import duties on processed coffee remains an issue only in some OECD countries. This issue however may still be a problem in non-OECD countries. For example, in the Russian Federation, "attempts are being made to increase tariffs even further to protect the local industry." (Lewin, Giovannucci and Varangis, 2004, p.63) Brazil still faces higher tariffs for processed coffee in non-OECD countries like Argentina and Middle Eastern and North African (MENA) (see Figures 12 and 13).[61]

60. The International Sugar Agreement, the International Tin Agreement, the International Cocoa Agreement and the International Natural Rubber Agreement are examples of other international commodity agreements.

61. The figure of the tariffs for the Russian Federation was omitted because the data was too spotty to report.

Table 1. World tariffs on processed coffee

Country/Area	Roasted	Decaffeinated, Roasted	Soluble
United States	0	0	0
European Union[a]	7.5% MFN[b]	9.0% MFN	9.0% MFN
	2.6% GSP	3.1% GSP	3.1% GSP
Canada	4.15 cent//kg MFN	4.15 cent//kg MFN	14.32 cent//kg MFN
	0 GSP	0 GSP	0 GSP
Japan	20% General	20% General	12.3% General
	16% WTO	16% WTO	13.2% WTO
	10% GSP	10% GSP	9.0% GSP
Switzerland	0.69 SFR/kg MFN	0.69 SFR/kg MFN	2.13 SFR/kg MFN
	0.69 SFR/kg MFN	0.69 SFR/kg MFN	2.13 SFR/kg MFN

a. The EU exempts from tariffs African, Caribbean and Pacific (ACP) countries which have acceded to the Cotonou Agreement (replacing the Lomé Convention). The EU is also reducing tariffs against Brazilian soluble imports (Lewin, Giovannucci Varangis, 2004).

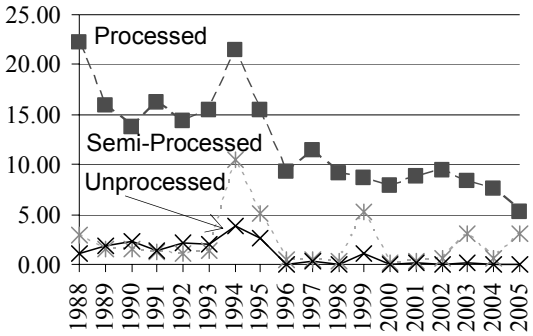
b. MFN represents most favourite nation. GSP represents the Generalised System of Preferences.

Source: ITC, 2006

71. The difference between the normal tariff rates (MFN rates – most favoured nations) and the preferential tariff rates (GSP rates – generalized system of preferences) often provides some benefit. In addition, African, Caribbean and Pacific (ACP) countries which have acceded to the Cotonou Agreement (replacing the Lomé Convention) with the European Union are exempt from EU import tariffs. This exemption is also granted to some developing countries outside the ACP group.

Figure 8. Brazil: Tariffs on coffee imposed by OECD countries

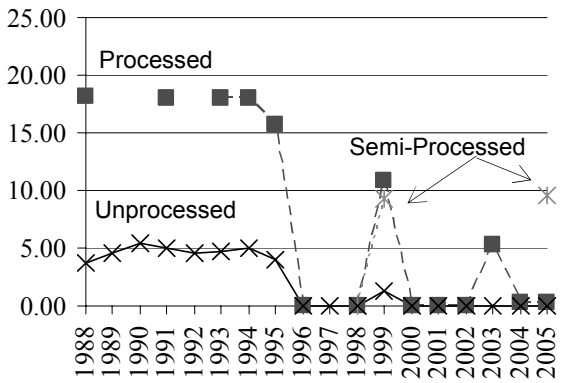
Weighted Average for OECD-24



Source : WITS, 2006

Figure 9. Nicaragua: Tariffs on coffee imposed by OECD countries

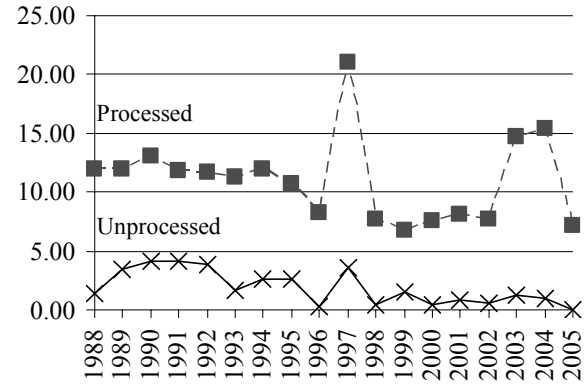
Weighted Average for OECD-24



Source : WITS, 2006

Figure 10. Kenya: Tariffs on coffee imposed by OECD countries

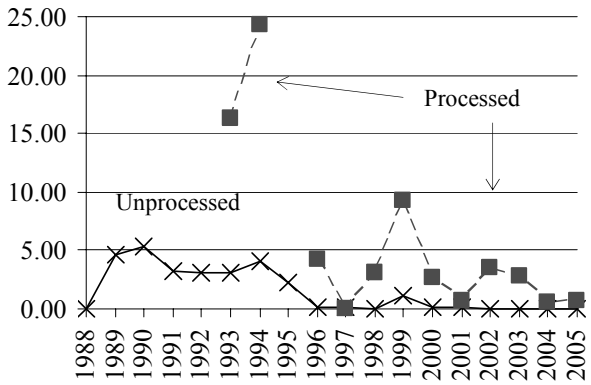
Weighted average for OECD-24



Source : WITS, 2006

Figure 11. Vietnam: Tariffs on coffee imposed by OECD countries

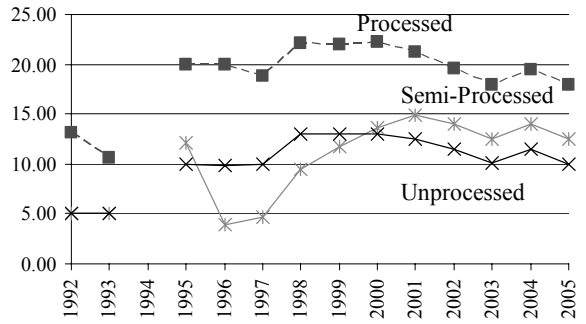
Weighted average for OECD-24



Source : WITS, 2006

Figure 12. Brazil: Tariffs on coffee imposed by Argentina

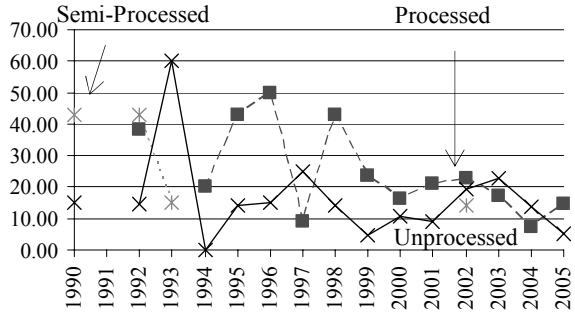
Weighted average for Argentina



Source : WITS, 2006

Figure 13. Brazil: Tariffs on Coffee imposed by Middle East and North African countries

Weighted average for Middle East and North African countries



Source : WITS, 2006

Country Case Studies

Brazil

72. In terms of total production, Brazil is the number one coffee producer. Since 1975, Brazil has produced on average over 25% of the world's total production. In different periods, Brazil has produced over 36% of world coffee. Brazil has traditionally been an Arabica coffee producer, producing over 60% of the world's Arabica. Most of Brazil's Arabica production is Natural Arabica (or Unwashed) coffee. In the 1970s, Brazil began producing Robusta coffee in noticeable quantities, and now Brazil is the number two producer with over 20% of world production (see figures 5-7 and 14). Brazil has a major effect on world markets "given both the country's total volume and the willingness of the industry to use [Brazilian

coffees] to replace other Arabicas or Robustas in their blends according to price." (Lewin, Giovannucci and Varangis, 2004, p. 75)

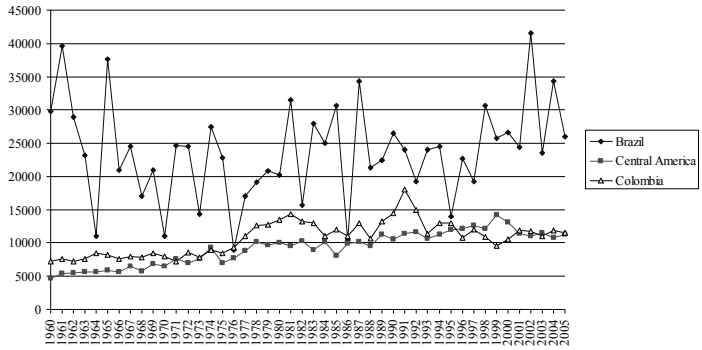
73. An important feature of Brazilian coffee production is substantial swings in production. Brazil has coffee production in regions that are far from the equator leading to regular threats from frost. Regions further north have the potential for drought. These weather-related events cause the Brazilian production to fluctuate dramatically. The effect on world prices is substantial. The frosts and drought of 1994 lead to a 43% reduction in Arabica production and to substantial price fluctuations. In nominal terms, the ICO Composite Price in 1992 was USD 0.53. It rose to USD 0.62 in 1993, and in 1994, the price was USD 1.34, a 118% increase. Because of the price increase, Brazilian producers planted coffee in new areas (Lewin, Giovannucci and Varangis, 2004).

74. In the late 19th and early 20th Centuries, Brazil exported 80% of total coffee and had substantial opportunity to influence the international price. Also Brazil had the ability to smooth over prices by holding stocks via a policy known as *Valorização*. Brazil used a variety of domestic policies to regulate the market such as, export taxes, multiple exchange rates, support prices, stockpiling (creation and destruction), tree elimination, etc. Brazil created the Instituto Brasileño do Café (IBC) in 1953. The IBC used a variety of policies, one of which was an export tax to regulate export prices (Jarvis, 2005). Brazilian producers also faced internal taxes, controls on agronomic practices and credit restrictions. At the end of the quota system of the International Coffee Agreement, the government eliminated the IBC and many of the previously mentioned policies. Other coffee-producing regions experienced similar deregulation. As a consequence of policy reform, domestic coffee markets became more efficient, and producers began to earn more of the free on board (f.o.b.) price, up to nearly 90% (Lewin, Giovannucci and Varangis, 2004). Brazilian exports have increased quite rapidly shortly after the dismantling of the ICA (Figure 14), which suggests that Brazil as the leading producer had been suppressing production and exports during the ICA period.

75. With the lower coffee price, reports suggest that diversification may have helped Brazilian producers: soybeans and corn are replacing coffee on some small farms, and sugar cane is being considered an attractive cash crop. In spite of this effect, the devaluation of the Brazilian real (BRL) may have protected some producers from the full effect of the price decline. This protection allowed producers to continue to develop their productive capacity. Other policies that have helped producers manage the coffee crisis include a financing package for producers that allowed the retention of the 2002-2003 production. The government also committed money via subsidised loans for farm maintenance and crop husbandry. One additional policy is a government-subsidised risk management programme. The programme allows producers to purchase a put option which allows the producer to sell coffee at a predetermined strike price. If the coffee price falls below the strike price, the government purchases the coffee at that strike price (Lewin, Giovannucci and Varangis, 2004).

Figure 14. Exports of coffee beans from Brazil, Central America and Columbia

1 000 60 kg bags



Source : USDA/FAS, 2006

Central America

76. As a region, Central America is the second largest producer of coffee in the world. In this study, Central America consists of Costa Rica, El Salvador, Guatemala, Honduras and Nicaragua. This region mainly produces Arabica coffee. Coffee employs nearly 200 000 coffee producers and over two million seasonal or permanent workers (World Bank, 2005). Coffee represents 28% of rural employment. For El Salvador the rural employment of coffee was 17%, but for Nicaragua it was 42% (Varangis, et al. 2002). The farms are diverse from small holders to large *fincas* (estates). Eighty percent of all producers worked on small farms, but produced only 10-20% of total production.[62] One to 6% of producers are considered large, but they produce over 36-58% of total production. The one exception was Honduras, where 92% of producers were on small farms and produced 45% of total production (World Bank, 2005).

77. On average, coffee exports from this region has risen over three percent per year from 1960 to 2005. However, since the beginning of the coffee crisis, production has fallen and not recovered. From the crop years 1999 to 2005, Arabica production in the region fell over 24%. Consider the change in export revenues from 2000-2002. In the region as a whole, export revenues fell by 44%. El Salvador was particularly hit with a loss of export revenue of over 60%. See Table 2 for country details. The effect of the coffee crisis on Central America is substantial. The distribution of producers and labour force involved in coffee market makes the coffee crisis of particular importance to the economic well-being of the region.

78. Coffee workers were the initial concern of the effects of the coffee crisis. Because these workers tend to own few assets, the prevailing impression was that these workers were more vulnerable to shifts in the coffee market. During the period of the lowest prices in the 2001/2002 crop year, the employment of seasonal workers fell by 21% and permanent workers fell by 54%; however, as noted by Varangis, et al. (2002) and World Bank (2005), the economies of Central American countries were growing during the coffee crisis, and some of these coffee workers may have found employment outside of the coffee industry.[63] The people most hurt by the coffee crisis were small-scale coffee producers. World Bank

62. Small farms are defined as those with production of less than 100 quintals (a 100 pound or 45.26 kg bag) per year.

63. World Bank (2005) notes, "Indeed, households whose members worked as coffee [labourers] in 1998 managed largely to maintain their income and consumptions levels in 2001, at least in part, by finding other earnings opportunities outside of agriculture. In contrast, small-scale, self-employed coffee farmers experienced substantial declines in income and welfare as prices dropped between 1998 and 2001." (p.14)

(2005) notes that, from 1998-2001, per capita income for small-scale coffee producers fell by 38% in Nicaragua. During the same time period, per capita income increased by 40% for rural, non-coffee households. Similar outcomes were found in El Salvador and Guatemala.

Table 2. Decline in coffee export revenue 2000-2002

	2000/2001	2001/2002	Change
	USD millions		*%*
Guatemala	589	400	-38
Honduras	345	167	-33
El Salvador	276	108	-61
Nicaragua	170	85	-50
Costa Rica	289	178	-52
Total	**1678**	**938**	**-44**

Source: Varangis, et al. 2002

79. Falling income in these communities can have far reaching effects. For those households with few options for outside income such as non-coffee production, remittances, etc., household consumption was often reduced, which reduced food consumption. For example in Nicaragua, malnutrition on a national level decreased; however, in intensive-coffee producing regions, malnutrition held constant or slightly increased. Additionally, school enrolment rates fell during the coffee crisis in many coffee producing regions. Given the outcomes of the coffee crisis many Central American countries devised adjustment programmes to assist coffee producers (IADB, World Bank and USAID, 2002).

80. Costa Rica and El Salvador have emergency funds to assist producers through periods of low prices. These countries established these funds after the collapse of the International Coffee Agreement in 1989. In Costa Rica the National Fund for Coffee Stabilization (FONECAFE) is to disperse money when the price falls below the cost of production by over 2.5%. The maximum debt that the FONECAFE can assume is USD 50 million. During the crisis, the FONECAFE paid producers USD 18.76 per 100 pounds of coffee. A portion of the fund came from the issuance of a bond. El Salvador has a similar fund called the Emergency Fund for Coffee. The focus of the fund is on debt relief. The fund was initially supported through an international loan. Also, El Salvador created a programme to renovate coffee farms (World Bank, 2005). Guatemala established a fund in 2001 to assist with diversification, debt restructuring, marketing, and agro-processing investments (IADB, World Bank and USAID, 2002).

81. The Honduran government created a fund to give producers direct payments. The fund is to be supported through export taxes.[64] The government also provided support to producers to reschedule bank debt (World Bank, 2005). Nicaragua was slow to act during the coffee crisis. The low prices hindered producers from repaying their loans which account for nearly 2.7% of GDP. By the end of 2001, the government promised to assist those producers with debts to banks and exporters. The coverage was only 15% of coffee producers, and they tended to be larger producers (IADB, World Bank and USAID, 2002). During the crisis, Honduras and Nicaragua both had conditional cash transfer programmes, which targeted the poor. The programmes provided support to households that sent their children to school and provided other specific investments that contributed to the health and nutrition of the children in the household. El Salvador has recently included a similar programme (World Bank, 2005).

82. In assessing the adjustment policies, the World Bank (2005) argues that many of the Central American governments did not have ex-ante policies to cope with the coffee crisis. Also, the governments did not provide counter-cyclical financing in the midst of the crisis. Many of the policies described above were short-run policies and were not well suited to manage the long-term structural changes that the coffee

64. The IADB, World Bank and USAID (2002) notes that there is a significant flow of coffee from Honduras to Guatemala, El Salvador and Nicaragua to avoid export taxes.

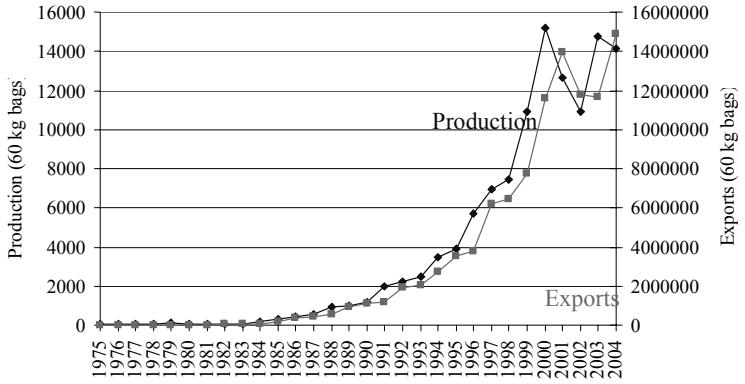
crisis represents. Many of the policies were too focused on large-scale producers and not small-scale producers or out-of-work labourers, but as shown earlier, the small-scale producers were the ones hurt the most (World Bank, 2005). This critique points to the need for careful planning of long-term adjustment policies and the need to assess the true needs of disadvantaged ones in the community after the structural change.

83. To this effect, the World Bank (2005) states "While some of the short-term dimensions may have been addressed, the longer-term issues related to structural changes in the coffee market—efforts that would have involved increasing coffee farmers' competitiveness or supporting agricultural diversification and/or movement out of the sector—were largely unaddressed. The outcome may, unwittingly, have been to keep some producers and workers attached to the coffee sector when economic circumstances dictate otherwise. In doing so, they may be making these producers and workers even more vulnerable to future coffee-related shocks." (p.32)

Vietnam

84. Vietnam is one of the most dramatic producers in the coffee market. Vietnam went from being one of the smallest exporters of coffee with 0.1% of the world market to being the second largest exporter with 13% of the world market, second only to Brazil. Vietnam is the number one producer of Robusta coffee with a small production of Arabica. In the late 1990s, Vietnam increased the area of coffee production by 20.7% each year (see Figure 15). From 1980 to 2000, the crop production area increased over 23 times while the output increased 83 times (ICARD, 2002 and Gresser and Tickell, 2002). The rapid expansion of coffee production led to the increase in the number of people involved in the industry. Coffee now directly employs 600 000 people and up to 800 000, nearly three percent of the labour force, during peak season. About 2.6 million people (561 000 households) cultivate coffee, making it the most common, perennial cash crop (World Bank, 2004).

Figure 15. Vietnam: Exports and production of Robusta coffee



Source: ICO, 2006a and USDA/FAS, 2006

85. This dramatic increase in production was the result of a number of different internal forces mainly through the liberalization of the economy. [65] This liberalization in the 1990s, called *doi moi* (or

65. The rise of Vietnam's coffee production is controversial because of the suggestion that the increase in production was the result of multilateral aid, but Baffes, Lewin and Varganis (2004) and Lewin, Giovannucci and Varganis (2004) state that the increase was the result of market liberalisation and support from the former Soviet block (see also ICARD and Gresser and Tickell , 2002). Stein and Burke (2002)

renovations), allowed private land ownership, better access to input and output markets and encouraged migration to Vietnam's central highlands area, an area well suited to growing coffee trees. Because Vietnam was not a member of the ICO, Vietnam was not subject to quotas so the expansion could occur without restrictions (Baffes, Lewin and Varangis, 2004). The increased demand for Robusta coffee in response to improved mixing techniques may have been of benefit to Vietnam which is mainly a Robusta producer.

86. Sequencing was one of the key aspects of the success of the policy reforms in Vietnam. In the Vietnamese agriculture sector, input markets were deregulated relatively early compared to the output market. The liberalisation of the input market permitted state-owned enterprises, which produced crops for exports, to import fertilizers. Because the prices of the imported chemical fertilisers were lower than domestic organic fertilisers, producers switched fertilisers. The export producing sector became more profitable. As the government liberalised the output sector, it encouraged producers to move to export crops while controlling basic foodstuff prices. The government encouraged coffee expansion through subsidised land, preferential loans and extension packages, which may have included support of some inputs (World Bank, 2004).

87. Summing up, liberalisation of input sector may have contributed greatly to Vietnam's success in the coffee sector. However it should be noted that there may have been some unintended consequences. One consequence was the limited participation of the private sector in the coffee market. The delay in private sector participation may be the result of the heavy, though declining, initial participation of the government in the marketing/supply chain. The limited existence of the private sector could cause problems in the future as the government continues its deregulation (World Bank, 2004). The increase in the use of fertilizers may also have had some unintended environmental costs.

East Africa

88. The African countries are not the largest producers of coffee; however, several are highly dependent on coffee exports such as Burundi, Ethiopia, Uganda and Rwanda. As in other regions, the coffee markets in East African countries have undergone substantial liberalisation in recent years. In this section we look at three East African countries, Kenya, Tanzania and Uganda which provide quite different experiences. Uganda has been the the first to liberalise its market in the early 1990s and currently has the most liberal coffee market of the three. Kenya has been the slowest in liberalising with a strong coffee board, a mandatory auction system and restrictions on market entry. Tanzania is considered to have a partially liberalised market.

Kenya

89. Kenya mainly produces Arabica coffee and is recognised as one of the best producers. In the mid to late 1980s, Kenya attained its highest level of production. As Figure 16 shows, the production in Kenya has fallen throughout the 1990s. The share of coffee in agricultural export earnings has declined over the last 10 years. The decline in production is mainly because a large number of producers were heavily indebted from the recent price declines (ICO, 2005) and were unable to maintain production. Approximately 60% of production comes from small holders, while the remaining 40% come from large estates (Ponte, 2001).

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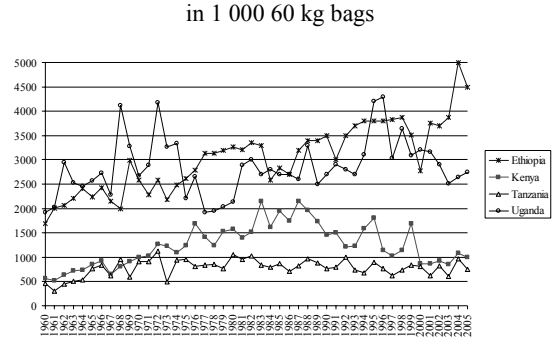
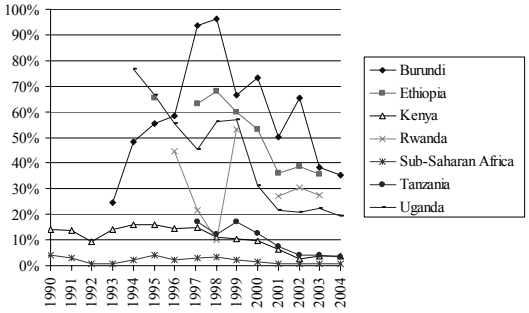
state that the World Bank contributed USD 100 million to the Vietnam's agricultural bank to support loans in coffee production. Also Nestlé, Kraft, Sara Lee and other large trading companies sponsored coffee-related development projects (Stein and Burke, 2002).

Figure 16. Total coffee bean production in select East African countries



Source: ICO, 2006a

Figure 17. Relative value of coffee exports to agricultural exports



Source : Author's Calculation

90. The market for Kenyan coffee had been highly regulated. Exporters could only purchase beans through an auction, and domestic marketing was channelled through the cooperatives and estates. Liberalisation has been limited to the processing level, where cooperative/government owned curing plants have been joined by privately owned curing plants. The presence of multinational corporations was relatively low compared to other more liberalised countries in the region. Despite the good reputation of Kenyan coffee, some market observers state that the quality of Kenyan coffee has suffered because inefficiencies and corruption of the cooperative management and the monopoly control of the Coffee Board (Lewin, Giovannucci and Varagis, 2004). However, Ponte (2001) and Daviron and Ponte (2005) provide evidence to suggest that quality in Kenya has not fallen especially in the top coffee classes which matters the most to Kenya. In 2002, the Kenyan government passed a new Coffee Act to liberalise the coffee market. The law permitted producers to choose their marketing agents freely, which had the potential of reducing the number of intermediaries in the marketing chain[66]. The Coffee Board has lost its monopoly power but serves as a monitor of quality (Lewin, Giovannucci and Varangis, 2004). Kenya is considered the least exposed to risk as long as it maintains its quality as the product is highly differentiated (Ponte 2001).

Tanzania

91. Coffee is the largest export for Tanzania, representing 10-30% of agricultural export value (see Figure 17). Around 95% of the coffee is grown by small holders on 1-2 hectares of land. Coffee production employs about 400 000 families. Nearly two-thirds of Tanzania's coffee is Arabica with the remaining Robusta. While the top Tanzanian coffee is of lower quality compared to the top Kenyan coffee, the quality of Tanzanian coffee is more homogeneous and used as filler in blends and/or as a substitute for Colombian coffee. This means that price competitiveness is important (Ponte 2001).

92. Prior to 1990, the marketing of coffee was highly regulated, such that all inputs, financing, exports, etc. were organised through the cooperatives and Tanzanian Coffee Marketing Board (TCMB). A

66 . Another important feature of this new system in terms of quality has been a change from a "pooled system" to a system where cooperatives and estates can choose between the "pool system" or "out of pool system". Under the "pool system", proceeds were pooled according to each coffee class for the year and payments to cooperatives were made proportionately. This system cushioned farmers from price fluctuations. In the "out-of-pool system", the coffee owner gets paid in full after the auction sale, minus deductions for services and handling. Under this system, prices are subject to greater fluctuation, but there is a more direct link between the quality of the bean and the price received. (Ponte 2001)

multi-payment system was put in place to reduce price uncertainty facing growers.[67] In 1990, the government introduced limited reforms regarding inputs, price announcements, and retention of export earnings. Then in 1994, the government introduced new reforms that allowed private traders to purchase coffee directly from growers and process it in their own factories under a license. The more formal reforms that began in 1994 was prompted by the declining share of export prices that producers received (Baffes, 2003). However, the Tanzanian Coffee Board retained numerous regulatory powers including licensing powers and the function of running the coffee auction, allowing domestic traders to buy only at authorised buying posts (Ponte 2004).

93. The policy reform generated a restructuring of the marketing chain for coffee in Tanzania. Upon reform, local and multinational corporations began entering the marketing chain of coffee production. MNC exporters have vertically integrated into processing, domestic trade and in some cases even estate production (Ponte 2001). The concentration of the firms has increased such that the top five exporters control 59-64% of the market, with multinationals controlling 56% of all exports in 1999/2000 (Ponte, 2001). "The presence of international firms with an interest in [coffee] translated into sufficient investment to provide reduced costs, whilst a sufficient number of competing firms, including the co-operative union, seems to have limited the emergence of non-competitive behaviour." (Temu, Winter-Nelson and Garcia (2001) p.220) The increase in competition has put considerable pressure on existing cooperative unions, and as a result most of them have folded (Ponte 2004). In order to protect the interests of the cooperative union in the Kagera district, the government suspended the licenses of private domestic traders in that district in 2000 (Ponte 2001, Ponte 2004, Baffes 2003).

94. The above partial market liberalisation has had mixed results in Tanzania. The supply response has been limited as can be seen in the lack of growth in production. This is considered in part to be the result of decline in input use as credit provision collapsed (Baffes 2003). Quality is said to have declined. Ponte (2001) suggests the breakdown of the multi-payment system[68] (Ponte 2001) as the main reason for quality decline. Baffes (2003), however, stress other reasons such as estate nationalisation in the past, agronomic problems (poor husbandry, old trees and disease) and limited reform. Although government is responsible for quality control, it has been rarely conducted before or after reform. Although quality may have declined, coffee producers seem to be receiving a higher price and a larger share of the world price (Temu, Winter-Nelson and Garcia, 2001). A well-functioning auction market which provides a viable alternative to direct sale to a multinational may have been instrumental in achieving such results (Winters-Nelson and Temu, 2002), although some argue that the auction should be made voluntary in order to reduce the costs of vertically integrated exporters and estates (Baffes, 2003).

67 . Under the multi-payment system, producers would deliver coffee to primary societies and receive an initial payment based on a previously announced price. The societies took the coffee to the state-controlled cooperative union for curing etc. The coffee was then delivered to the Tanzanian Coffee Marketing Board, for purchase at auction by private exporters. The auction realisations were sent to the primary societies after deduction of fees by the Coffee Board, via the cooperative unions who also deducted costs and fees. Although this system reduced uncertainty of growers, it entailed considerable price risk for the cooperative unions as there was no guarantee that the auction realisation would be higher than the initial payment plus various fees. It also provided quality incentives to primary societies and farmers. The long marketing chain did however lead to higher costs (Ponte 2001, Baffes 2003).

68 . Market entry of MNCs and new traders forced cooperatives to compete with buyers on the basis of their first payment to farmers. In experienced buyers bought at higher prices with insufficient quality checking. As a result, the price-quality incentive broke down which has contributed to the breakdown of the multi-payment system.

Uganda

95. For nearly 30 years, Uganda was the largest producer of coffee beans in Africa. About 40% of Uganda's export value is coffee. Agricultural output comes almost exclusively from smallholders; most producers, around 80%, produce on less than two hectares of land (World Bank, 1993). Nearly 85% of its production is Robusta coffee. Uganda's Robusta coffee is considered one of the best in the world, in terms of quality comparable to Brazilian and Indian/Bangalore and in terms of quantity (Ponte, 2001). As figure 17 shows, coffee is a large part of the agricultural exports of Uganda. The decline in relative export value is a mixture of disease-induced reduction of production and lower market prices.

96. In 1991, Uganda went through a substantial market liberalisation to improve the domestic coffee market. The liberalisation was in response to the impact of an overvalued exchange rate, the inefficiencies of the country's Coffee Board, political instability and the price decline of 1989. A new agency called the Uganda Coffee Development Authority was assigned the task of regulating the industry, quality control and promotion (Baffes, Lewin, and Varangis, 2004). Uganda now boasts the most liberalised coffee trading environment in East Africa. Licensing requirements are minimal, coffee can be bought anywhere, in any form and can be sold anywhere else within the country (Ponte 2001). The Coffee Marketing Board Ltd. went out of business soon after liberalisation and the cooperative sector has also disappeared with one exception.

97. After liberalisation, Uganda's coffee production increased because of the new environment, higher prices and new investments by local and multinational corporations (Lewin, Giovannucci and Varangis, 2004). The new investments came in the form of export companies, private primary buyers, hulling plants and export processing plants.[69] Liberalisation has benefited producers as domestic markets have become more efficient and farmers are paid a higher share of the export price than in the pre-liberalisation system (Ponte 2001). Despite some early reports of declines in quality, quality of coffee has improved as restructuring has progressed (Ponte (2001)) and in response to efforts of the Uganda Coffee Development Authority[70] (UCDA) (Daviron and Ponte, 2005). While Uganda has relatively benefited from the global coffee market, entrance of new manufacturers of Robusta such as Vietnam and advances in mixing techniques may pose challenges in the future.

98. As can be seen above, market reforms in East Africa have followed very different paths with differing results. While there does not seem to be a single path, the Tanzanian case shows that in liberalising it is necessary to ensure that proper incentive structures are in place for the market to function effectively. "Overall, the appropriate regulation at the domestic level is essential if a more active role for producing countries in the governance of the global value chain for coffee is envisioned (Daviron and Ponte, 2005)." (p. 110)

69 . The new investment in Ugandan coffee market was not costless. In line with the rapid expansion of the Robusta market, many of the new firms "bought fast" without great regard for quality, and the quality suffered as well as the price (Ponte, 2001). Over time, the number of exporters has gone back to pre-liberalisation levels and some MNC exporters who had initially made investments in response to liberalisation have withdrawn from primary processing, stopped financing agents and reduced the number of buying posts.

70 . The UCDA removed low grade coffees from the market by deducting the cost from the growers for the percentage of low quality in the sample as part of a plan to eliminate low grade coffee from exports in accordance with plans of the ICO (Lewin, Giovanucci and Varangis, 2004)

Long-Term Solutions—Perhaps

99. From the previous discussion, we see examples of changes in agricultural and adjustment policies used to cope with the structural change of the coffee market in general and the coffee crisis specifically. Some of these policy changes do not address fully the longer-term commodity problems, low producer prices, which coffee producers face. The changes that coffee producers face are similar to the ones that other producers of soft commodities face. This commodity problem is particularly challenging for producers in agricultural commodity-dependent developing countries (ACDDCs) where producers face prices that perennially generate low returns. Long-term solutions to the structural change that the coffee crisis represents are similar to the solutions for other soft commodities. The literature suggests three broad types of long-term solutions: change of supply, change of demand and government intervention. The following looks at these possible long-term solutions for coffee in the context of the broader study.

100. National governments, multilateral lenders and aid agencies are trying to change the underlying supply of coffee. A change in the supply can come from many different approaches If the price is low (and volatile), then one solution is to make producers more efficient, lower costs, lower price risk, etc. Many multilateral lenders and aid agencies have provided much support in this area. More efficient producers are clearly better able to handle the vicissitudes of the coffee market; however, more efficient producers also tend to produce more and if their production is not differentiated or if there is little value-added beyond the raw commodity, the producers will be in the same situation as before, low returns to their production (DFID, 2004). This poses an important question in the context of discussions on aid for trade. How can donors provide the best support to improve the livelihoods of producers but in ways that are sustainable throughout changes in market conditions?

101. The other approach to dealing with the supply is vertical and horizontal diversification (DFID, 2004). Vertical diversification is moving up the supply chain to capture more of the value added (e.g. roasting and generating soluble products). If producers were to diversify vertically, issues such as tariff escalation would have to be addressed (Hallam, 2003). Beyond tariff escalation, vertical integration has other challenges: how to finance the move up the supply chain, how to access saturated markets, and how to compete against market leaders such as Nestlé, Philip Morris, Proctor & Gamble, etc., among others. More fundamentally, for these strategies to work, the appropriate infrastructure and investments must be in place to access higher valued markets (see Winter-Nelson and Temu (2002)).

102. Horizontal diversification is moving into other productive activities, other crops or out of agriculture. As we see in the tobacco case, diversification could be an effective solution for the problem of large supplies relative to demand. Box 1 gives an example of diversification into a profitable crop but one that produces negative societal results. The NGO community has argued that full use of current and future WTO rules to reduce support to agriculture in developed countries will give coffee-dependent countries greater access to agricultural markets. Even if markets are more open, small producers, especially those in remote, challenging agro-climatic regions may not be able to take advantage of these markets.

Box 1. Coffee and the drug trade

In Ethiopia some coffee producers have switched from coffee to khat,[a] a stimulant that can bring in three times what a small producer can get for coffee. This is the result of a drop in price per kilogram of coffee from USD 3 to USD 1, a level at which some farmers find themselves unable to support their families. The Ethiopian government refuses to clamp down on this activity simply because it feels farmers have the right to make a living.

a. Khat is an amphetamine like stimulant that is banned in United States and several European countries.

Source: Thompson, 2003

103. On the demand side, which is linked to vertical diversification, specialty coffees may offer some producers greater returns. Several market observers have argued that adjusting demand is a good approach for dealing with the structural change of the coffee market (Daviron and Ponte, 2005; Hallam, 2003; Ponte, 2001; Scholer, 2004; TechnoServe, 2003; World Bank, 2005; among others). Specialty coffees represent a wide variety of coffees that consumers pay a premium: sustainability coffees (fair trade, bird-friendly, organic, etc.), flavoured coffees, among others. Specialty coffees represent 10% of total production (Scholer, 2004). The market for specialty coffees is growing, about 10-20% in retail markets, but it is still a niche (Bacon, 2004 and Scholer, 2004). Specialty coffees may offer some producers access to higher prices; however, as the niche moves into the mainstream and large multinationals adopt similar strategies, price premiums may decrease and its long-term prospects are uncertain.[71] Governmental policy is limited in this area because the designation of specialty coffee is privately created and certified.

104. The move to specialty coffees is expected to result in higher prices for producers; however, as Daviron and Ponte (2005) point out, "specialty coffee (intended as high-quality) does not necessarily entail higher prices for better quality coffee at the farm gate (especially among smallholders), nor does it lead to the strengthening of producer organizations in the absence of other favourable factors." (p., 254) The issue of quality is considered by many to be the way forward. Declining quality of coffee in general and the blending of higher and lower quality coffees (e.g. Robusta coffee blended with Arabica coffee) are cited as the main reasons for price decline. Various agencies have provided ways to encourage improved quality, for example the Cup of Excellence® of the International Trade Centre (Reinstra, 2004). The International Coffee Organization (ICO) in 2001 instituted the Coffee Quality-Improvement Programme as a way to help improve the quality of coffee (Box 2). The country cases indicate how different countries, through domestic regulatory bodies or producer groups, have responded to quality issues.

71. In its review of fair-trade, Vihinen and Lee (2005) state, "On the producer side, the scheme's accessibility seems problematic in terms of how producer groups are and have been targeted for inclusion, especially given the limited market for Fair Trade products. Issues related to producer transparency also exist; for example, how producers learn of Fair Trade opportunities, and how information is made available to them to make it clear which opportunities would be the most lucrative. Hurdles exist also, especially for smaller producer groups, with respect to certifying their conformity with the standards, in part due to high costs of the imported services."

Box 2. Coffee Quality-Improvement Programme

The Coffee Quality-Improvement Programme (CQP), sponsored by the International Coffee Organisation, consists of target standards for exportable coffee. From October 2002, Members shall strive not to export coffee with the following characteristics:

- For Arabica, in excess of 86 defects per 300g sample (New York green coffee classification/Brazilian method, or equivalent); and, for Robusta, in excess of 150 defects per 300 grammes (Vietnam, Indonesia, or equivalent);
- For both Arabica and Robusta, moisture content below 8 percent or in excess of 12.5 percent, measured using the ISO 6673 method.

The CQP also envisages the development of alternative uses for sub-standard coffee.

The CQP is designed to improve the balance between supply and demand of coffee by stimulating demand through the provision of a better overall standard of quality to the market. It thus reflects the objectives of the International Coffee Agreement 2001. In the longer term the CQP can be seen as an important tool in stimulating growth in demand for coffee.

Source : ICO, 2006b

105. As mentioned in the cases, a few private firms control a large share of the coffee processing market. In 1998, Philip Morris, Nestlé, Sara Lee and Proctor and Gamble controlled 63% of the roasting and instant manufacturing markets (Daviron and Ponte, 2005; see Fitter and Kaplinsky (2001) for similar results). If this level of concentration is generating imperfectly competitive markets, then low producer prices are not surprising. In this light, Daviron and Ponte (2005) suggest international rules against anti-competitive behaviour.

106. As has been noted in the country cases, coffee from certain countries have been recognised for its exceptional quality. Kenya is a prime example, but coffees from other countries or regions not mentioned here are of note like Jamaica's Blue Mountain and Kona coffee from Hawaii. The appellation coffees receive price premiums. For example, the export value of Blue Mountain was 15 times great than the ICO average price. Because of price premiums, fraudulent sales have occurred (Lewin, Giovannucci and Varangis, 2004). One way for producers and their communities to benefit directly from the unique appellation of their coffees is to expand international rules related to geographic indicators to coffee products (Daviron and Ponte, 2005).

107. One last group of policies to aid in the structural adjustment process are those sponsored specifically by national governments. Many of the solutions mentioned above involve the private sector or public-private partnerships. The case studies reveal several policy interventions by the governments of the affected countries. In Central America, several of the countries instituted a direct payment which may have abided by the "green box" specifications of the Agreement on Agriculture.[72] A common policy in many of the countries was a trust fund created from producer levies and from multilateral lenders. In a number of the countries, state trading enterprises (STE) exist or have existed. Some market observers have

72. They tend to be policies that are not targeted at particular products, and include direct income supports for farmers that are not related to (are "decoupled" from) current production levels or prices. They also include environmental protection and regional development programmes. "Green box" subsidies are therefore allowed without limits, provided they comply with the policy-specific criteria set out in Annex 2 (WTO, 2006)

argued for the reinstitutions of similar enterprises in the context of WTO rules (DFID, 2004). As the deregulation examples suggest, these STEs were, at times, problematic. Another approach to the long-term crisis is the use of producer organisations as seen in Colombia (see Box 3).

Box 3. Columbia's National Federation of Coffee growers

The primary long-term focus of the Federation of Coffee Growers (FNC) is threefold: help stabilize income using market mechanisms such as put options, provide a purchase guarantee to all coffee growers that meet minimum quality levels, and offer key public services such as research, extension, and promotion. This might seem to be a very extensive set of tasks but actually represents a sharper focus for an organization that owns an airline and at one point owned banks, and a shipping line, and also built schools, roads, and clinics in the coffee growing areas. While Colombian coffee growers have always received a high percentage of the international export price, a significant portion of this revenue was directed by the Federation toward a variety of these services. In recent years, the FNC had come under attack due to its lack of focus and the increasing inefficiencies of a large bureaucracy. Under new leadership, and a significant restructuring, this organization of more than 500,000 growers is striving to find a strategic path not just through the current crisis but also toward a competitive long-term position.

Source : Lewin, Giovannucci and Varangis, 2004

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ANNEX

Table 3. Major coffee exporting countries

Coffee Type	Exporting Country
Colombian Milds	Colombia, Kenya and Tanzania.
Other Milds	Bolivia, Burundi, Costa Rica, Cuba, Dominican Republic, Ecuador, El Salvador, Guatemala, Haiti, Honduras, India, Jamaica, Malawi, Mexico, Nicaragua, Panama, Papua New Guinea, Peru, Rwanda, Venezuela, Zambia and Zimbabwe.
Brazilian Naturals	Brazil, Ethiopia and Paraguay
Robustas	Angola, Congo (Dem. Rep.), Ghana, Guinea, Indonesia, Liberia, Nigeria, OAMCAF Members – Benin, Cameroon, Central African Republic, Congo (Rep.) Côte d'Ivoire, Equatorial Guinea, Gabon, Madagascar and Togo –, Philippines, Sierra Leone, Sri Lanka, Thailand, Trinidad and Tobago, Uganda and Vietnam.

Source: ICO, 2006b

Box 4. Coffee Production

Coffee is a perennial tree that grows in the tropics (between 25° N and 25° S) where the temperature ranges from 20 to 25°C. Coffee trees take three to five years to begin producing. The lifespan is around 40 years, but maximum yield occurs in trees between five and fifteen years old. The two main types of coffee are Arabica and Robusta. Arabica coffee is grown at higher altitudes (1 200 to 2 000 meters), has a milder flavor, and fetches higher prices on world markets. Robusta is normally grown at lower altitudes (below 1 200 meters) and is easier to process than Arabica (Brown, 1991). The flowering of the coffee tree is generally triggered by rainfall, and the tree produces coffee cherries six to nine months after flowering. The cherries ripen at different rates in the same field and even in the same tree. Harvesting is done by hand and is quite labor-intensive. *Strip-picking* involves removing all the cherries from the tree at one time. This method of harvesting is more common with the lower-priced Robusta coffee. *Selective picking* involves selecting the ripe cherries for harvesting over the course of several picking sessions. This method is more often used with Arabica coffee, particular when the wet processing method is used

Source : Minot, 1998

2. TOBACCO

Executive Summary

Introduction

This chapter examines cases of structural adjustment in tobacco farming. It surveys experiences in **Brazil**, **China**, the **EU**, **Malawi** and the **United States**. The case study focuses on the US. The policy changes and market settings of the other countries are presented to explore adjustment in their markets. The structural change in the tobacco industry is the result of several factors: change in consumption patterns in terms of location, and national and global tobacco-use cessation efforts, among others.

Key Points

- The case of tobacco provides interesting counter examples of the differences between the adjustment experiences of developed and developing countries. The **EU** and the **US** are adjusting their policies to expose tobacco producers more to market forces. Both include a compensation package for tobacco producers which may help some producers to leave the industry.

- Both the **US** and the **EU** created adjustment policies that may have been influenced by the rules of the Uruguay Round Agreement on Agriculture. Both policies are attempts to compensate producers in ways that are decoupled (or least trade distorting), a core concept of the Agreement on Agriculture.

- In creating structural policies, a lesson from the **US** case presents an example of decentralised structural adjustment policies. Because of the differential effects of structural change, flexibility in the implementation of adjustment policies may have been beneficial to meet the needs of diverse beneficiaries. Another lesson learned is the usefulness of policy dialogues throughout the structural adjustment planning process.

- The **US** case provides an example of sequencing. Policy dialogues and gradual reforms may have helped ease the pains of structural adjustment. However, reforms that are too slow, especially with indications of future compensation, may keep some policy beneficiaries in the industry longer than would be optimal for the producer or the government.

- Production of tobacco is moving from developed to developing countries. In response, developing countries must develop adjustment policies to cope with these changes. **Brazil** may be in a better position to take advantage of the current and future changes in tobacco markets because of the public-private partnerships that are increasing tobacco yields and quality in Brazil.

- The public-private partnerships in **Brazil** and the work of the burley producer association in the **US** show that structural adjustment can be assisted not only by the government but by active participation of the private sector and NGOs.

- FDI may provide a mutually beneficial link between a developed country company with a developing

country producer. The developing country producer can gain better technology, better market information, capital and access to stable markets while the investing company can also gain a stable supply of better quality inputs. This linkage may enable both parties to capitalise on new opportunities of the changing tobacco market.

- **Malawi** is benefiting from the changes in the tobacco market currently; however, if market conditions change the Malawian economy could be hurt because of its dependence on tobacco. **China** up to now has maintained a rather closed tobacco economy and has had a relatively small effect on the global market despite its large production and market. However, it is in the process of opening up and its future role in the global tobacco market is unclear.

Background

108. In the past twenty years, a major shift in the global demand and supply patterns for tobacco has taken place. Changes in consumer preferences, such as greater health concerns, and changes in the domestic and international regulatory environment have led to a fundamental change in the tobacco market. Here, we will first take a bird's eye view of the structural changes in demand and supply in the global market, and then look at the US and some other markets which are experiencing structural change as a result. The review will focus on the structural adjustment policies that the US and other countries have used to help producers adjust to the changing market place. The focus is also on agricultural producers and not the manufacturers of tobacco products.

Global Demand Issues

109. The global demand structure for tobacco (and tobacco products) has changed considerably in the past twenty years. Up to the late 1980s, global consumption had increased quite rapidly. The increase in consumption in developing country markets, such as China, was the main reason for the rapid growth in global demand. Meanwhile, some developed country markets grew relatively more slowly. However, from the end of the 1980s until the present, world consumption of cigarettes has begun to level off, increasing at only 1.5% per year (see Figure 18).[73] In addition, the consumption patterns have been changing. The consumption shares have been evolving such that OECD member countries' consumption of cigarettes is now relatively small compared to that of non-member countries such as Russia, Indonesia and China (see Figure 19). The global market for tobacco and cigarettes is experiencing a structural shift although world demand for tobacco is still increasing. By 2010, tobacco consumption will rise by 3.1% for developing countries, and tobacco consumption is expected to fall by 0.2% for developed countries (FAO, 2003).

110. The decline in consumption of cigarettes and tobacco in the developed world has been the result of changing consumer preferences sparked, in part, by the work of health officials and advocates. Traditionally, tobacco and cigarettes have been regulated and taxed as a significant source of government revenue in many countries. In some countries such as Japan, cigarette production has been reserved for state-owned enterprises. As more research shows the negative health consequences of tobacco use and as healthcare costs have become an increasing burden, many countries have regulated the use of tobacco to reduce its use through excise taxes, advertising regulations, smoking restrictions, etc.[74] In the recent past,

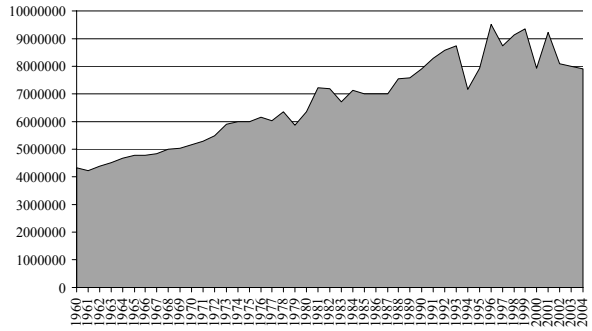
73. Cigarettes account for nearly 85% of the tobacco used in the US (Kennedy, 2002). Therefore, in reviews of the US and other countries, the focus will be on tobacco that is used for cigarette use.

74. In *Curbing the Epidemic* (World Bank, 1999), researchers review a number of studies that showed the effectiveness of common polices, including taxes and non-price measures (consumer information, bans on

lawsuits against US tobacco companies have also had a dampening effect on demand because of the resulting price increases.

Figure 18. Total disappearance of tobacco

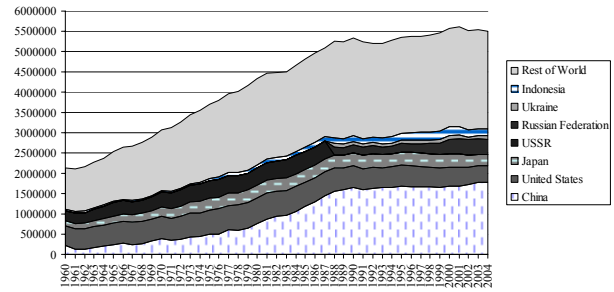
in metric tonnes



Source: FAS/USDA

Figure 19. Domestic consumption of cigarettes

in metric tonnes



Source: FAS/USDA

111. The effort of public health officials to discourage smoking in developed countries has even led to the World Health Organization's Framework Convention on Tobacco, an international agreement to discourage smoking (See Box 5). These domestic and international trends have led to a major shift in global demand patterns, characterized by a slowing growth rate for aggregate demand, with shrinking developed country markets but increasing in developing country markets.

Box 5. World Health Organisation's Framework Convention on Tobacco

Around the world, public health officials argue for greater efforts to discourage the use of tobacco. At the forefront of this drive is the World Health Organisation (WHO). As early as 1995 the WHO has tried to develop an international instrument to deal with the public health concerns of tobacco use. International recognition has increased in gradual steps, through guidelines and a declaration. On 27 February 2005, the WHO Framework Convention on Tobacco Control entered into force. As a framework convention that is to be further developed, demand is to be reduced through (1) price and tax measures and (2) non-price measures. Supply reduction is to occur through the following channels: (1) prevention of illicit trade in tobacco products; (2) prevention of sales to and by minors; and (3) provision of support for economically viable alternative activities.

Even though the Convention took ten years to come into force, it reveals a concerted effort of the global health community to address the issue of tobacco consumption world wide. It remains to be seen if the Convention will have any effect on the consumption of tobacco. The Convention recognises the need to assist tobacco producers and those involved in the tobacco industry with adjustment assistance.

Global Supply Issues

112. Tobacco farm sales achieved a high in the early 1990s (see Figure 20). As of 1990, China was the largest global producer with a global share of over 32%, followed by the US, India and Brazil. It should be noted that developed and developing countries have both produced tobacco and often in small holdings. Developed countries have experienced a decline in production, while most of the expansion in

advertising and promotion, and smoking restrictions). The studies suggest that different policies have had differential effects on the consumption of tobacco.

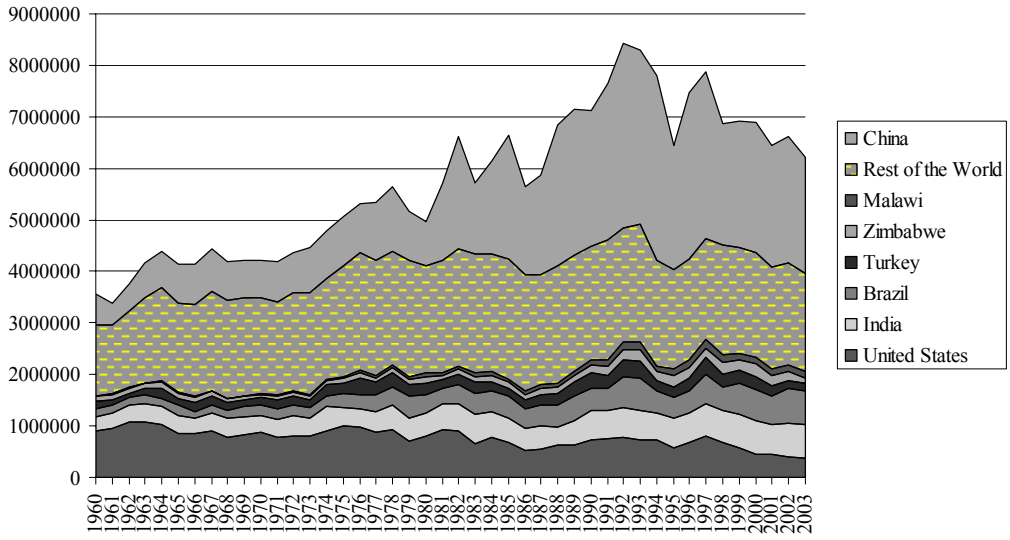
production has been in developing countries especially in Brazil, India, Zimbabwe, and Malawi (see Figure 20). Major factors underpinning this trend include:

- Declining political and taxpayer support for tobacco production in developed countries, including the US and the EU;
- The cost competitiveness of developing countries and the relatively high profitability of tobacco compared with that of many other crops in these countries;
- Direct technical and financial support for tobacco cultivation in several developing countries; and
- Investment by international companies in the promotion of tobacco production and in cigarette manufacturing in selected developing countries (Jaffee, 2003, p.6-7).

113. Worldwide, between 11 and 12 million producers cultivate tobacco, with about two-thirds of these in China. While economies of scale exist in the processing and logistical management of tobacco leaf and in the manufacturing of cigarettes, few economies of scale exist in the actual cultivation of the crop. Although machines can be used during the land preparation, very careful crop husbandry is required and tobacco leaves are harvested by hand. Largely for these reasons, tobacco is typically cultivated on small farms often dependent on family labour. On such farms, the typical plantings of tobacco are a few hectares (see Table 4). In countries such as China, Turkey and (recently in) Malawi, the typical tobacco planting is 0.5 hectare or less (Jaffee, 2003).

Figure 20. Farm sales of tobacco

in metric tonnes



Source: USDA/FAS, 2006

Table 4. Major tobacco producing countries: comparative structural features

	Brazil	China	India	Malawi	Turkey	US	Zimbabwe
Production (000 MT)	590	2600	660	125	260	480	210
Planted Area (000 Ha)	330	1600	435	140	280	195	80
No. of Growers (000)	135	8000	850	375	576	90	18
Average Size of Tobacco Farm (Ha)	16.8	0.4	2.5	1.0	4.9	66	300[c]
Average Tobacco Planting (Ha)	2.6	0.2	1.3	0.2	0.5	4.2	40
Tobacco Varieties[a]	75% FC 16% B	90% FC 9% B	77% N[b]	92% B	95% O	66.7% FC 33.3% B	95% FC

a. FC represents flue-cured varieties, B represents burley, O represents Oriental varieties and N represents non-cigarette varieties.
b. Modified with data from FAO (2003).
c. Jaffee (2003) noted that the size was larger than 300 ha.

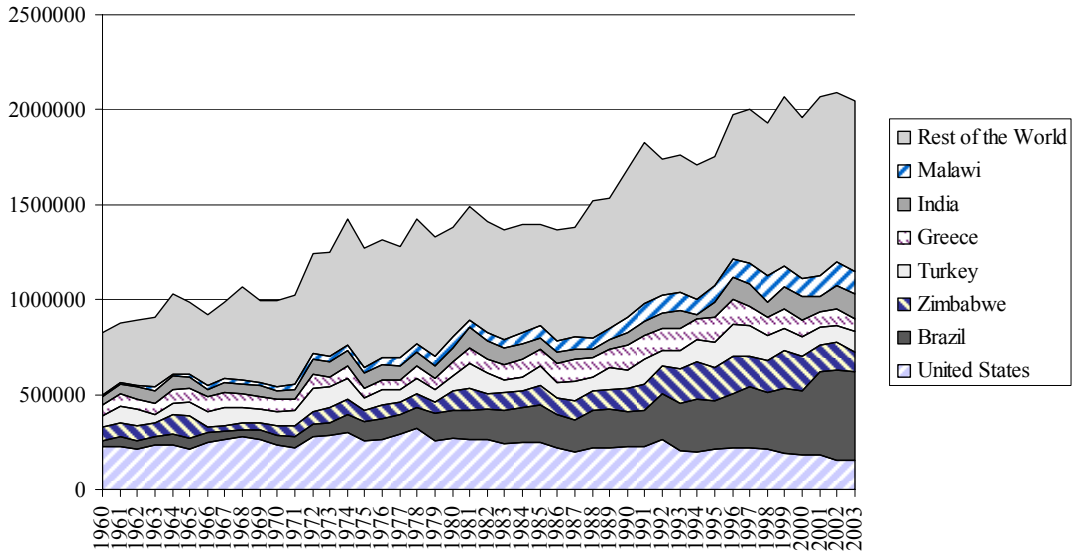
Source: Jaffee, 2003

Country Case Studies

114. The change in the production, in addition to the changes in demand, has triggered a global structural change. Producers in developed countries like the EU and the US are losing market share in domestic and global markets to producers in developing countries (see Figure 21). The structural adjustment has been a major revision of the tobacco support policies. Countries like Brazil and Malawi have increased their production and taken market share from the EU and US in international markets. China was unique in that it had a rather closed market for tobacco and global structural adjustment has not affected its producers as much; however, the situation is changing. By 2004, China has become the fourth largest leaf exporter. The country vignettes that follow explore the structural change and adjustment in some of the tobacco-producing countries.

Figure 21. Exports of tobacco

in metric tonnes



Source: USDA/FAS, 2006

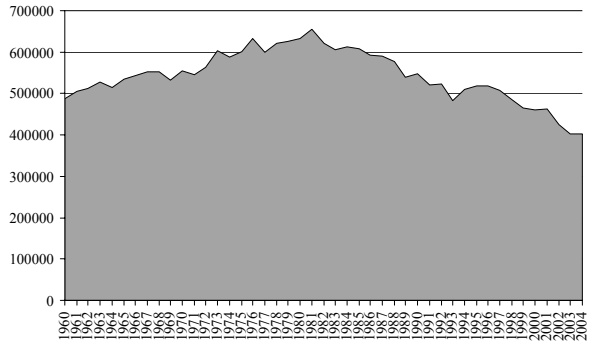
The United States

115. "The restrictions on many crops didn't endure like those on tobacco because of international competition. 'But with tobacco, the international competition didn't become intense until the 1980s and early 1990s.' And when competition intensified, the price support program hamstrung tobacco farmers' ability to compete." (Nash, 2005, p. 20) The story of structural change and adjustment for US tobacco is a complex one. While specific to the US, a number of lessons can be learned from this example.

Demand for Tobacco and Cigarettes in the US

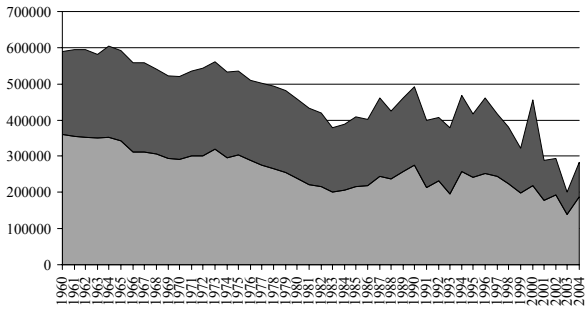
116. US demand for cigarettes reached a peak in 1981 at 640 billion pieces and has fallen every year since (Figure 22). The fall in consumption has been the result of a change in consumer preferences and price increases. The consumption (disappearance) of US tobacco has fallen dramatically (Figure 23). Additionally, imported tobacco took up a larger share of domestic consumption (Figure 24).

Figure 22. US consumption of cigarettes
in million pieces



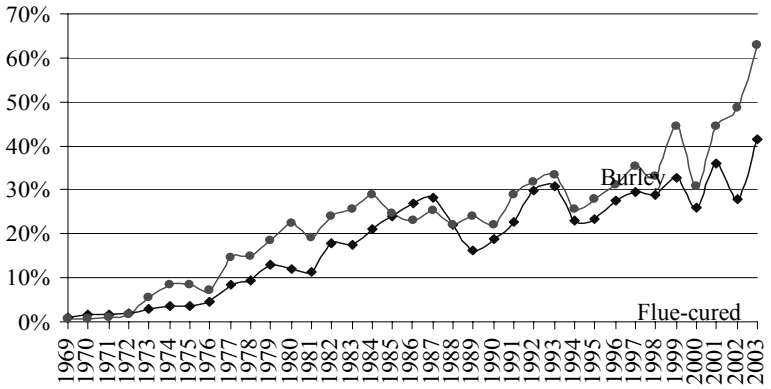
Source: USDA/FAS, 2006

Figure 23. US domestic disappearance of flue-cured and burley tobacco
in metric tonnes



Source: USDA/ AMS, NASS and FAS, 2005

Figure 24. Import share of US total use



Source: FAS/USDA, 2006

117. In the light of the consumption changes for cigarettes and increasing costs, tobacco companies have searched for ways to cut costs. One of the ways of cutting costs was to change manufacturing techniques. New manufacturing techniques allowed tobacco firms to use less tobacco through the more efficient use of the tobacco leaf. (Zhang and Husten, 1998) In a world of no trade, this change in use would have been enough to generate substantial reductions in the demand for tobacco leaf.

118. Tobacco companies have also cut costs by sourcing tobacco from other countries.[75] Initially, because of tariffs and quality differences, foreign tobacco was less attractive to use. However, as price differentials increased, quality differences decreased, and tariffs became less of an issue on a relative basis, imports from other countries began to replace US tobacco leaf. As a result, the percentage of domestic tobacco in US cigarettes went down to only 60% (for burley tobacco) and 40% (for flue-cured tobacco), down from nearly 100% in the 1970s (see Figure 24).

119. Despite increased international competition, US tobacco prices continued to increase because of the tobacco quota program and tariff barriers (see below). At such prices, US tobacco producers not only lost market share domestically but also in international markets, particularly to the developed world. As with the US, these developed country markets have been experiencing declines in tobacco consumption (Serletis, 2004).

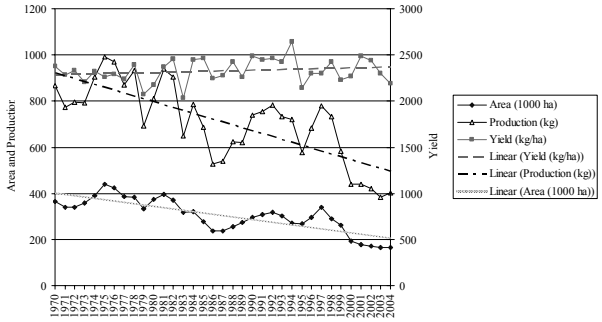
120. As a result, the production and supply of tobacco in the US decreased quite rapidly. From 1965 to 2002, the number of US tobacco farms fell by over 85% from over 500 000 to 27 000. The number of hectares dedicated to tobacco production fell by less, around 50%. Overall tobacco production fell by 60%. The yield tended upward. These figures point to the fact that producers left tobacco production, and some producers took land out of tobacco production; however, those producers who remained tended to increase their farm size (see Figures 25 and 26).

121. In real terms, the crop value of tobacco declined during the period 1970 to 2003 (see Figure 27). However, the remaining, larger, and presumably more efficient, producers earned larger gross revenue on each hectare of land than previous producers. Tobacco earned USD 8 000 per hectare in the early 1970s, but by 2000, tobacco was earning as much as USD 10 000 per hectare. This result is driven by the increase in the supported price received by the producer and the increased productivity of the farms.

122. Drawing on their reputation for high quality tobacco, US tobacco producers had exported roughly 30% of its tobacco abroad. US tobacco producers commanded a price premium relative to similar tobacco varieties in part because international markets considered US tobacco the pre-eminent flavour tobacco (see Figures 28 and 29). However, export data suggests that the US was losing markets overseas. Producers in countries like Brazil, Zimbabwe and China were increasing their exports of tobacco. Other countries such as Brazil, Zimbabwe, Malawi and Argentina have narrowed the quality gap.

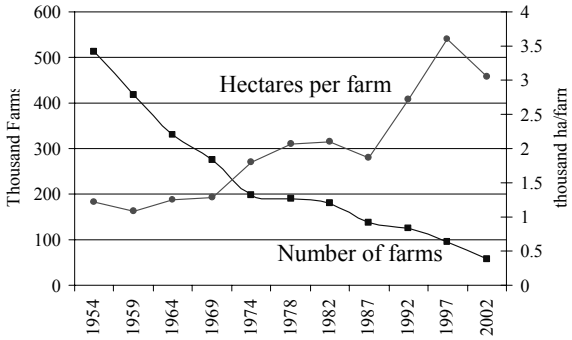
75. However, it should be noted that the cost share of tobacco in cigarettes is small: "The value of domestically grown tobacco represents only about [USD 0.02] of the domestic retail tobacco dollar, while imported leaf represents another [USD 0.01 to USD 0.02]. Of the [USD 0.02] received as gross receipts, tobacco growers keep only a fraction." (Gale 1997, p 39)

Figure 25. US tobacco production, yield and hectares



Source: USDA/ AMS, NASS and FAS, 2005

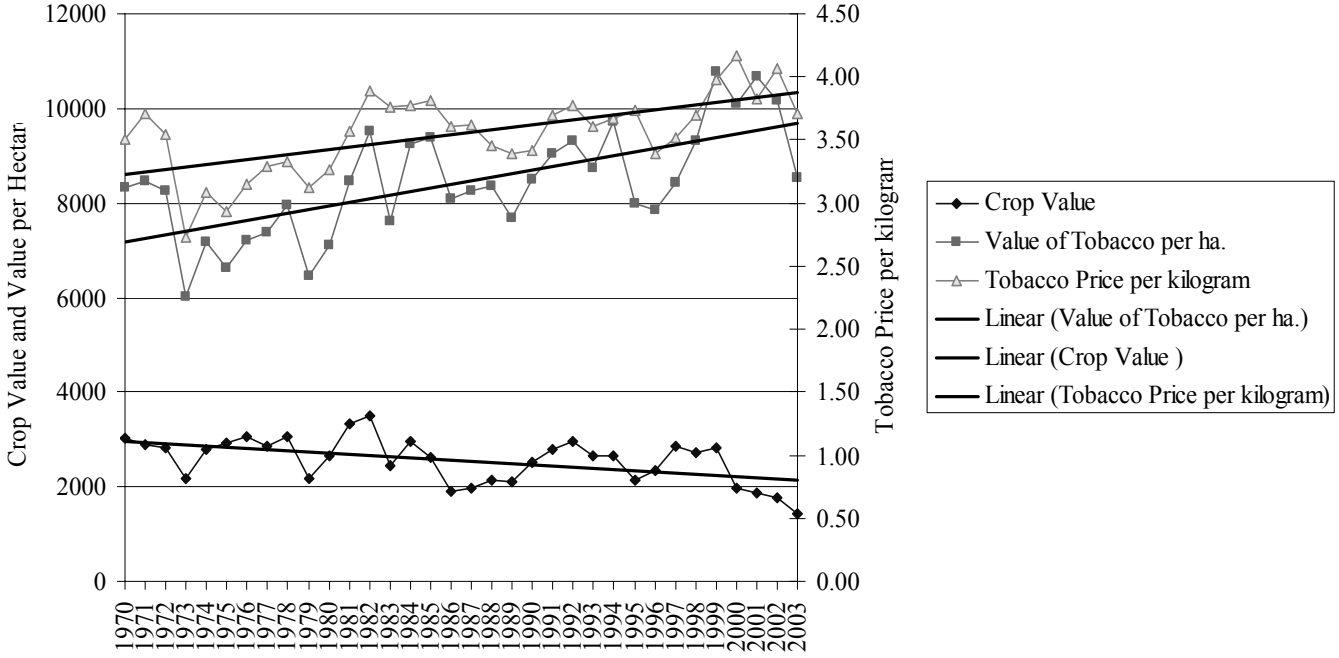
Figure 26. US tobacco farms numbers and size



Source: USDA/ AMS, NASS and FAS, 2005

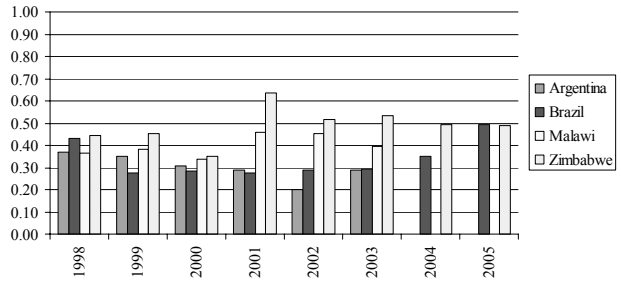
Figure 27. Value of tobacco

USD base year 1981



Source: USDA/AMS, NASS and FAS, 2005

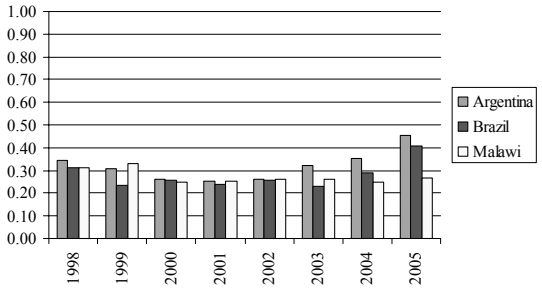
Figure 28. Price of flue-cured tobacco in select countries relative to the US price



1. The data for 2005 are estimates.

Source: Universal Corp, various years

Figure 29. Price of burley tobacco in select countries relative to the US price



1. The data for 2005 are estimates.

Source: Universal Corp, various years

The US Tobacco Price Support Program

123. Through the Agricultural Adjustment Act of 1938, the US government established the tobacco price support program (TPSP) as a form of structural adjustment after the Great Depression in the US. The policy had not changed substantially since its inception. The TPSP was composed of production quotas, a price support and marketing loans. At the same time, other tobacco policy instruments that affected the industry included the following: smoking restrictions, excise taxes, settlement payments and tariff-rate quotas.

Table 5. Tobacco policy instruments

Policy Instrument	Description	Effect on Tobacco Market
Tobacco price support programme	Production quota and price support and marketing loans	Raises leaf prices through the restriction of quantities because of a quota. The quota is not fully transferable and supports potentially inefficient production of tobacco in historical patterns.
Tariff-rate quota	Exporting countries have tariff-rate quotas	May raise the leaf prices through a tariff.[a]
Settlement payments	Payments from manufactures to State governments or other title-holders to settle legal claims	Manufacturers raise prices to cover all or part of the settlement costs. Higher prices are passed on to consumer, reducing demand for tobacco products.
Smoking Restrictions	Prohibitions on smoking in workplaces, restaurant, and other places. Antismoking campaigns.	Reduces demand for tobacco products
Excise taxes	Tax assessments per unit of tobacco products. Federal Taxes paid by manufactures. State taxes paid by wholesalers	Manufacturers and wholesalers raise price of tobacco products to cover all or part of tax liabilities. Higher price passed on consumers reduces demand for tobacco profits.

a. Except for Brazil, most countries have not filled their TRQs. The effect of the TRQ has been limited by the duty draw back programme, which exempts products from the TRQ restriction if the tobacco imported is used to manufacture cigarettes that are exported.

Source: Gale et al., 2000, modified by the Secretariat.

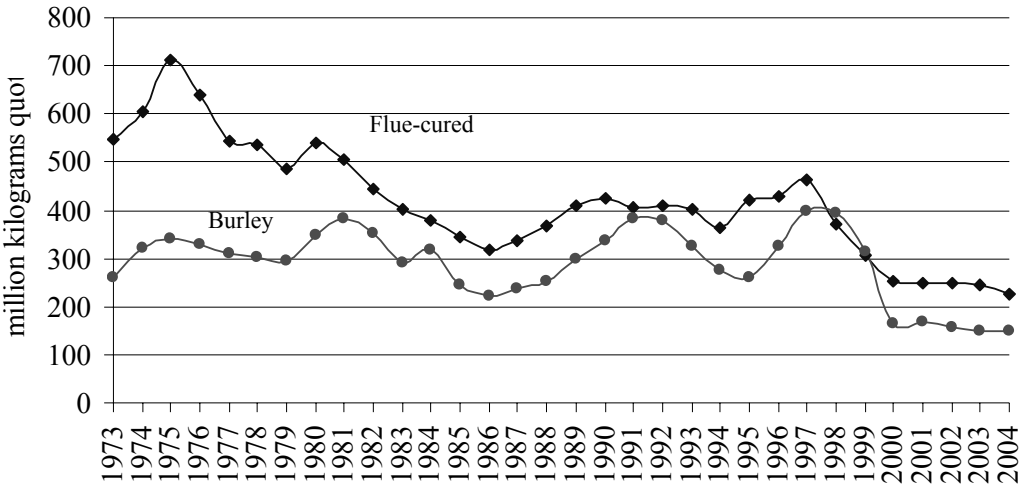
Production Quota

124. In the 1938 Agricultural Adjustment Act, the US government assigned to land that had historically produced tobacco the right to produce tobacco. These rights limited tobacco marketed by restricting the amount of tobacco produced. The limitation on supply led to a higher and more stable price of tobacco. Because the right to produce (or quota) was assigned to the land, the quota initially could not be traded independent of the land. In 1962, this restriction was relaxed to allow "lease and transfer" of tobacco quotas within counties (Rucker, Thurman and Sumner, 1995). This adjustment to the law permitted the emergence of non-tobacco farmers owning quota.

125. Non-tobacco farmers who owned quota are simply called quota owners. As noted in Womach (2005), in 1999, there were about 416 000 quota owners, and in 2002, there were 57 000 tobacco farms. Rough estimates suggest that almost all tobacco producers own at least some quota, but many tobacco producers rent from the quota owners. The rent of quota had been a cost of production that many tobacco producers argue had caused them to lose their competitiveness in world markets.

126. The US government had the right to adjust the amount of the quota to ensure that the price was maintained at a profitable level for farmers. The quota was adjusted to reflect demand (domestic use and exports) for tobacco. Additionally, the quota is adjusted so as to raise the quota price above the government support price. The national marketing quota calculation is the sum of 1) the total estimated amount that domestic cigarette manufacturers intended to purchase from auction markets or from producers during the marketing year, 2) the average annual quantity exported from the US during the three marketing years preceding the year for which the quota is being set, and 3) the amount the Secretary determines is necessary to increase or decrease the producer association inventory to reach the reserve level. The Secretary of Agriculture had the discretion to raise or lower the quota by three percent of the calculated amount (Agricultural Adjustment Act 1938). An additional adjustment was made if the marketings of the previous year were above or below the quota of the previous year. As the demand for US tobacco fell, the quota levels also fell (see Figure 30). Quota owners and quota-owning tobacco producers had a triennial vote on whether to maintain the quota programme.

Figure 30. Quota levels of flue-cured and burley tobacco



Source: USDA/ AMS, NASS and FAS, 2005.

Marketing Loans

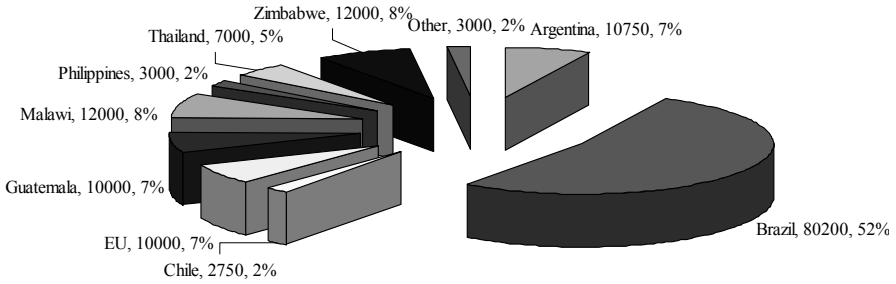
127. In addition to the quota, producers benefited through non-recourse marketing loans. The US government announced the loan price of tobacco each year. If the auction price fell below the announced price (the government support price set by formula[76]) producers would receive the loan price from their co-operative, who borrowed the money from the Commodity Credit Corporation (CCC). The CCC would take possession of the crop for sale at a later date. The support price is available only to tobacco sold in auctions. In 1982, the US Congress passed the No-Net-Cost Tobacco Program Act. This Act required an assessment (or a tax) on each pound of tobacco sold. The assessment was used to pay for the cost of the marketing loans.

Trade Policy

128. The US also has a tariff-rate quota for imports of tobacco. The in-quota tariff, on a weighted average basis, ranged from 50% to 80%. The out-of-quota tariff was 350%. For the year 13 September 2003 to 12 September 2004, the limit for flue-cured and burley imports was 150.7 million kilograms. By the end of that year 70.9% of the limit was met.[77] The distribution of the TRQs for 2004/05 is shown in Figure 31. These TRQs are not applicable to tobacco that is imported and re-exported in the form of manufactured products. Tobacco imported for this purpose is given a duty draw back (Capehart, 2005).

Figure 31. Distribution of US tariff-rate quotas

for 13 September 2004 through 12 September 2005 in Metric Tonnes



Source: US Customs Service

76 According to the *Tobacco Yearbook* 1997 (USDA/ERS), "The price support for flue-cured and burley…is the preceding year's support adjusted by changes in the 5-year moving average of prices, excluding the highest and lowest years (two-thirds weight) and changes in a cost-of-production index (one-third weight). Costs include variable expenditures, but exclude costs of land, quota, risk, overhead, management, marketing contributions, and other items not directly related to tobacco production."

77. In contrast to the fill rate in 2003/04, the fill rate for 1999/2000 was 52.6% (ERS/USDA, 2001). This result is consistent with the increased use of foreign tobacco in US product.

Recent Policies Supporting Structural Adjustment in the US Tobacco Industry

129. As international and domestic pressures for structural change in the US tobacco market increased, the US government developed a series of policies that had the aim of assisting in the structural adjustment process. While all of the policies created were not part of a large, systematic effort to assist in the structural adjustment of tobacco producers, many policies did just that. Some of these policies however may have also encouraged producers to stay in the industry and slowed the adjustment of these producers.

Master Settlement Agreement

130. The Master Settlement Agreement (MSA) was the result of the class-action law suits against cigarette companies (see Box 6). The MSA provided the involved US States with resources to recuperate the health costs associated with tobacco consumption. Several studies indicated that the job loss associated with the MSA could be in the range of 353 000 to 555 000. Overall the loss would be more than compensated by the redistribution of expenditures of ex-smokers. However, job losses were expected to be concentrated in the Southeast tobacco region,[78] and the new jobs, where they could be found, typically were expected to be low-skilled jobs (GAO (1998), Warner et al (1996) and Gale (1997)). For this reason, some states used a portion of the funds from the MSA for structural adjustment for tobacco producers and their communities.[79] The structural adjustment projects included direct payments to tobacco farmers and economic development projects.

Box 6. The Master Settlement Agreement (Phase I)

Beginning in the mid 1990s, more than 40 states and some localities sued tobacco companies, alleging that the industry violated antitrust and consumer protection laws, withheld information about the adverse health effects of tobacco, manipulated nicotine levels to keep smokers addicted, and conspired to hold back less risky and less addictive tobacco products from the market. In 1997 and 1998, four states—Florida, Minnesota, Mississippi, and Texas—settled their lawsuits by negotiating independent agreements with the tobacco industry. In November 1998, four of the nation's largest tobacco companies—Philip Morris Incorporated, R.J. Reynolds Tobacco Company, Brown & Williamson Tobacco Corporation, and Lorillard Tobacco Company[Error! Reference source not found.]— negotiated an agreement with the attorneys general of the remaining 46 states thereby settling a number of lawsuits brought by these states against these tobacco companies.[Error! Reference source not found.] The terms of this agreement, known as the Master Settlement Agreement (MSA), apply only to those tobacco companies and states that are parties to the agreement. Under the MSA, the tobacco companies are required to provide monetary relief to states in the form of annual payments and reimbursement for attorney fees. The total amount was USD 206 000 million to be paid over 25 years (Capehart, 2001). The MSA also imposes restrictions on the tobacco companies' marketing and advertising practices. Furthermore, the MSA established a national foundation to support study and programmes to (1) reduce youth tobacco use and substance abuse and (2) prevent diseases associated with tobacco use. Additionally the states were given freedom to use the money as deemed appropriate. Seven of the 13 states allocated 6% of the total MSA payments for assistance to tobacco grower and economic development projects.[Error! Reference source not found.]

a) Several other tobacco companies have joined the MSA since the time of the agreement.

b) The study by the GAO (2001) reports on the 46 states that are party to the agreement. The agreement also included the District of Columbia and the five US territories.

c) The 13 tobacco states are Alabama, Georgia, Indiana, Kentucky, Maryland, Missouri, North Carolina, Ohio, Pennsylvania, South Carolina, Tennessee, Virginia, and West Virginia.

Source : GOA (2001)

78. The Southeast tobacco region included Georgia, Kentucky, North Carolina, Tennessee, and Virginia.

79. Seven of the 13 tobacco states allocated USD 651 million to structural adjustment projects.

131. Four states used funds from the MSA as direct payments to farmers. Maryland was the only state to require the cessation of tobacco production in order to receive the direct payment. The other states (Kentucky, North Carolina and Virginia) provided direct payments with few or no requirements. The GAO (1998) highlights two states because of the different approaches to direct payments that each state took. Maryland set up a task force to develop a long-term plan to help move farmers away from tobacco but to keep them in agriculture. Maryland allocated USD 11.5 million for a state-wide tobacco buyout program.[80] Virginia on the other hand distributed USD 102 million to its farmers. The money was not used to encourage tobacco production but was used to compensate growers for business losses and lost sales due to the decline in tobacco consumption (GAO, 2001).

132. The MSA required tobacco companies to meet with the political leadership of tobacco producing states to develop a plan to assist in the structural adjustment of the MSA. In July 1999, the four major tobacco companies and the 14 states that produce and manufacture tobacco for cigarettes agreed to a payout of USD 5.15 billion into the National Tobacco Grower Settlement Trust (Phase II).[81] As most of the tobacco growing and manufacturing occurs in this region, the financial loses experienced by the tobacco companies could affect adversely these communities and tobacco producers. The Phase II funds were created to help mitigate these potential adverse effects (GOA, 2001). Additionally, the impetus that led to the MSA also sparked a series of policy dialogues that explicitly dealt with the structural changes affecting the US tobacco producers and communities.[82]

133. President Clinton established the Commission on Improving Economic Opportunity in Communities Dependent on Tobacco Production while Protecting Public Health. The Commission was charged with advising the President on "changes occurring in the tobacco farming economy and recommend such measures as may be necessary to improve economic opportunity and development in communities that are dependent on tobacco production, while protecting consumers, particularly children, from hazards associated with smoking." (President's Commission, 2001, p. 47)

134. The President's Commission (2001) recommended to the President a number of structural adjustment policies called the Tobacco Equity Reduction Program (TERP): The US government should buy back the tobacco quota. The no-net-cost price support should remain intact. Non-transferable production permits based on tobacco demand should be distributed each year to active producers. The US government should ensure an equitable international market for tobacco with the removal of unfair trade barriers to the exports of US producers. Finally, the Commission recommended the creation of a centre for tobacco-dependent communities. The centre was to help communities develop new economic activities instead of tobacco production.

Description of the Tobacco Buyout

135. After much negotiation, a tobacco buyout was signed by the President on October 2004. The US tobacco quota buyout has two major components: 1) the elimination of the TPSP (quota, price support and

80. The state of Maryland produces a different variety called Maryland tobacco. Producers in Maryland had a different quota than producers in the rest of the US.

81. The four tobacco companies were Philip Morris Incorporated, Brown & Williamson Tobacco Corporation, Lorillard Tobacco Company, and R.J. Reynolds Tobacco Company. The 14 states include those in the original MSA and Florida, which had its own settlement outside of the class action suit.

82. Several efforts had been made concerning tobacco producers and public health officials to encourage producers to leave the industry. In 1985 former President Jimmy Carter brought together tobacco producers and public health officials to discuss their concerns. In 1989, public health advocates hosted a conference to reform the TSPS. Several other meetings occurred which dealt with the theme of assisting tobacco farmers in light of the public health concerns (President's Commission, 2001).

marketing loans) and 2) the creation of compensatory payments (quota owner payments and active producer payments). The estimated cost of the buyout is USD 9 600 million. The quota owners are receiving USD 15.43 per kg for the quota that they possessed. The average quota owner will receive USD 16 000 over ten years. Tobacco producers are eligible for a USD 6.61 per kg "transition payment" in addition to the quota buyout, if they own quota. This payment is based on the production from marketing year 2002. The production eligible for payments is 199.57 million kilograms; therefore, the total payment should amount to USD 2 900 million for approximately 57 000 producers (Womach, 2005). The average quota-owning, tobacco producer is expected to receive USD 51 000 over ten years.[83]

136. The payments are to come from tobacco product manufacturers and importers. Some of the Phase II moneys were designated for rural development and programmes to help producers move away from tobacco. In the new buyout no moneys were designated to programmes like these. Only direct payments are left to assist producers and communities adjust to the policy change.

Box 7. Summary of the tobacco quota buyout

Total Payments and Other Spending

Total payments to quota owners and producers, as well as costs related to disposition of loan pool stocks, are limited to USD 10 140 million. There is no additional spending for community assistance or other activities. [Sec. 627]

Funding Sources

Payments to quota owners and active producers, and expenses related to disposal of existing price support loan stocks, are from a Tobacco Trust Fund created in the Commodity Credit Corporation (CCC). Trust Fund revenues are from quarterly assessments on tobacco product manufacturers and importers. Cigarettes pay 96.331% in the first year; other tobacco products share the remainder. [Sec. 625] Cigarette manufacturer Phase II producer payment obligations of about USD 2 600 million for 2005-2010 end under provisions of the Phase II agreement.

Payment Timing

Payments to quota owners and producers are made in 10 equal annual installments from fiscal year 2005 through fiscal year 2014. [Sec. 622(e) and 623(d)] Advance payment options likely will be available to owners and producers from financial institutions to which they assign their contracts. [Sec. 624(e)]

Quota Owner and Active Producer Payments

Quota owners (numbering about 416 000, including about 57 000 active producers and 359 000 landlords) as of the date of enactment are to be paid USD 15.43 per kg on marketing year 2002 basic quota, divided into 10 equal payments of USD 1.54 per kg. [Sec. 622] (Estimated cost is USD 6 700 million).

Active producers (numbering about 57 000), who raised tobacco in 2002, 2003, or 2004, are to be paid USD 6.61 per kg on 2002 marketing year effective quota, divided into 10 annual installments of USD 0.66 per kg. Payments are reduced by 1/3 for each year tobacco was not grown by the producer. [Sec. 623] (Estimated cost is USD 2 900 million. Nearly all producers own some quota.)

83. Because producers in different states produce different types of tobacco (flue-cured and burley) and each type of tobacco has different production and yields, the average estimated payout obscures the diversity of payments that different producers will receive. Consider these examples: An average North Carolina tobacco producer harvesting about 8.5 ha in 2002 and producing 20 411.66 kg, owning 33% of her quota would receive USD 240 000 over ten years, USD 105 000 in quota payments and USD 135 000 in transition payments. A Kentucky tobacco producer with only 1.62 ha of tobacco, producing 3 401.94 kg of tobacco in 2002, owning 44% of his quota would receive a lump sum of USD 45 600 over ten years, USD 23 100 in quota payments and USD 22 500 in transition payments.

Production Controls and Restrictions

Marketing quotas and acreage allotments are terminated. [Sec. 611 and 612] There will be no restrictions on who can produce tobacco in 2005 and future years, or where it can be produced. Production likely will be consolidated onto fewer and larger farms in the most economical regions. Total production is expected to increase.

Price Support

Price support loans and no-net-cost assessments are terminated. [Sec. 612] Market prices are expected to decline by 20-30%.

Source : Womach (2005)

137. According to the ERS/USDA data base on WTO notification of domestic support, the tobacco price support programme did not have non-exempt payments; therefore, it was not notified under the aggregate measure of support (AMS). However, in 1999, 2000 and 2001, emergency/disaster payments were made that were reported under the AMS. These payments were not a part of the tobacco support programme of the marketing quota and no-net-cost marketing loan.

138. Cofrancesco (2003) and Tiller (2003) considered the proposals of the buyout and argued that the proposed buyout and the transitional payments were either not subsidies under the Subsidies and Countervailing Measures Agreement or if they were subsidies that the policies would be considered "green box" measures. Such measures do not have to be reported as AMS, and they do not have to be reduced. These measures are considered decoupled; that is, they are believed not to affect production directly. In addition to the support provided by the US government, private entities are also assisting in the structural adjustment process (see Box 8).

Box 8. Tobacco Infrastructure Investment Program

In 2004, the Burley Tobacco Growers Cooperative Association (BTGCA) announced the Tobacco Infrastructure Investment Program. The program was instituted with the expressed purpose of helping its members to compete in this new market environment after the buyout.

To help tobacco growers in making the transition to the post-buyout environment, the BTGCA is providing a pilot program to invest over USD 3.9 million in cost match funds to allow tobacco growers in Kentucky, Ohio, Indiana, Missouri and West Virginia to improve their tobacco infrastructure.

The goals of this program include (1) encouraging and assisting BTGCA members in improving their competitiveness in global tobacco markets; (2) improving the financial opportunities for producers transitioning into a new market environment due to the end of the federal price support program; (2) ensuring that the BTGCA region's identity as the world's premier producer of the highest quality burley is sustained in the future, and that producers' global market share is retained and increased; and (4) assuring tobacco manufacturers that U.S. burley growers intend to retain their global leadership position in tobacco production through incorporation of the latest technologies to improve efficiency and product quality.

The maximum cost share under this program is 50% of the eligible expense up to USD 5 000 per farm household. Initiatives that improve the efficiency of production such as equipment and facilities are eligible for the 50% cost share.

Source : BTGCA (2004) Downloaded 12 December 2005, http://www.burleytobacco.com/Default.aspx?tabid=78

139. From early reports, the buyout had the effect of diversification. Parker (2005) notes "Yet the drumbeat of so many legal problems for the tobacco industry appears to contribute to the decision of some farmers to grow no tobacco at all. After years of hard work on the farm, it seems that some farmers are planning to take their tobacco buyout payments and cultivate mostly highly mechanised crops on their farm. This will reduce the need to find and pay relative high wages for farm labour." (p.1)

140. Tobacco production is typically labour-intensive, but the labour requirements are falling in much of the US. For example in 1972, 92% of labour used manual methods for flue-cured tobacco; by 1991, only 2% of farms used manual methods (Kennedy, 2002). In recent years, farms near metropolitan areas have experienced labour shortages. Therefore, the labour issue for tobacco production in the US is highly dependant on the location of the farm and the possible alternative sources of income.

141. From 1954 to 2002, the number of US tobacco farms fell from 512 000 to 57 000 a reduction of 89%. Some of the reduction is the result of general declines in the number of people involved in agriculture; however, some proportion of producers left because of structural adjustment. Producers and tobacco labours who are near metropolitan areas with employment greater opportunities—those areas that are less tobacco dependent—will least likely be affected by the new market environment after a structural change.

142. The Economic Research Service of the US Department of Agriculture classifies communities as farm dependent if 20% or more of the total earnings in a county come from agriculture. Because county-level income data are not available for tobacco, an approximate measure is the ratio of tobacco gross receipts to total proprietor and labour income (TPLI) by place of work (Gale, 1998). From these measures only about 5% of the nearly 600 counties are dependent on tobacco production. These counties are the ones, amongst other tobacco producing counties, that have the weakest economic growth potential, as measured by real personal income growth. Therefore, these counties will be the ones with the greatest need for assistance in structural adjustment (Gale, et al, 2000 and Gale, 1998). The producers and labours in these regions will need the greatest help to adjust in terms of new jobs or training. Because of the diversity of the needs, based on differences in tobacco dependencies, structural adjustment policies that are decentralised are considered most appropriate. A one-size fit all policy will not benefit this diversity of communities.

143. The US case provides an example of sequencing which may affect producers' ability to adjust to structural change. Beginning as early as the 1980s market conditions indicated that US tobacco production was losing its dominance in world markets. In the same period, a series of meetings were held for tobacco producers and public health officials to find ways to reform the US tobacco policy. Concurrently, the quota levels were lowered in accordance with market conditions. In 1997, the class-action law suits occurred which had structural adjustment components. The dramatic shift in marketing from auctions to contracting also threatened the viability of the tobacco support policy (Caphart, 2002). In 2004, the tobacco policies were substantially reformed. While not organised, the sequence of events provided indications that the tobacco policies would eventually be reformed and that the tobacco industry was undergoing a structural change. Some producers left the industry during this time. However, some producers may have stayed in the industry so as to receive the benefits of a potential buyout programme, which had been mentioned in some of the early discussions of policy reform. Policy dialogues and gradual reforms may help ease structural adjustment, but reforms that are too slow, especially with indications of a major policy buyout, may keep some policy beneficiaries in the industry longer than would be optimal for the producer or the government.

European Union

144. In 2000-2002, production of tobacco was nearly 6.4 million tonnes. The EU was the fifth largest producer of tobacco behind China 38%, Brazil 9%, India 8% and the US 7%. Of the EU member states, Greece and Italy were the largest producers with nearly 75% of the EU production. Greece, an Oriental tobacco producer, had the slightly larger share with 38%, and Italy, a flue-cured tobacco producer, had 37.4% of total EU production. Though tobacco is important for a few regions of the EU, tobacco only accounts for 0.4% of the EU agricultural output at basic agricultural prices.[84] However, the trade of tobacco and related products shows their significance to the EU. In 2000-2002, the EU imported 34.7% of unmanufactured leaf and exported almost 20% of manufactured tobacco products (EU Commission, 2003).

145. Tobacco production in Europe, like most of the world, is labour intensive. In 2000, tobacco production employed over 126 000 annual work units (213 000 people), which is 2.4% of the total annual work units (AWU) employed in agriculture. Greece was the largest employer with 79 230 AWU while Italy had 23 120 AWU. Greece and Italy accounted for 81% of the total labour force involved in tobacco production. The EU tobacco sector employed over one million people and 440 000 people as full time equivalents. Most tobacco manufacturing is in Germany, the Netherlands and the United Kingdom, and they represent 63% of total employment (EU Commission, 2003).

146. Only the Makedonia-Thraki region of Greece had positive market margins. The reason for this result is that the Oriental varieties that the Greek producers grow earn a higher price relative to the other tobacco varieties. In the other regions, profitable production was only possible through subsidisation. For Greece, Italy and Spain, 98% of farm revenues came from subsidies, which is the highest compared to other supported commodities. Relative to other products, tobacco generates low income for most regions of Europe. The conclusion of the Commission's report on tobacco is "Without support, only the Oriental varieties in Greece could be profitable. In this respect, the raw tobacco sector appears very fragile." (EU Commission, 2003, p. 17)

147. The EU also has substantially reformed its tobacco sector. The old, support policy for EU tobacco consisted of a price premium for tobacco. The premium was a supplement to the tobacco price based on variety. A portion of the premium was based on production. The premium was notified as an "amber box" (coupled) policy and was to be reduced according to the Agreement on Agriculture. The support policy had measures to orient and limit production. There was a threshold of guaranteed support for the EU and tradeable production quotas to ensure respect of the threshold. Producers who wanted to leave the industry could have their quota bought back by the EU. As a form of structural adjustment, the EU policy had a Commodity Tobacco Fund. Initially the fund was created to campaign against tobacco consumption, but in 2003, the fund was used to move tobacco farmers off of tobacco through the results of agronomic or community development research.

148. The EU also has trade polices that affected imports. The EU has a common duty that varies between 11.2% and 18.4% depending on variety. Additionally, the EU has zero duties on tobacco from African, Caribbean and Pacific (ACP) countries and least developed countries and has reduced tariffs for a select group of other countries. The EU has no export subsidies for its tobacco (EU Commission, 2003).

149. Amid pressures of EU enlargement and concerns for public health, the EU revised its tobacco policy. Full decoupling of the premium is to occur over the four-year transition period beginning in 2006.

84. Seven regions have the bulk of tobacco production. Kentriki and Anatoliki Makedonia represent 60% of tobacco holdings. In terms of farm size Umbria, Aquitaine and Veneto have relatively large farm size relative to the Greek and other Italian regions (Campania and Puglia). Basic agricultural prices are the sum of producer prices and net subsidies on production (EU Commission, 2003).

In the transition period at least 40% of the premium is to be included in a decoupled single payment. The other 60% of the payment may be a coupled payment from the Member State. After the transition period beginning 2010, aid to tobacco producers is to be fully decoupled (a "green box" policy). Half of the former support is to be used for rural development in tobacco-producing regions. The other half will be used as a single farm payment, which is decoupled (EU Commission, 2005).

Brazil

150. Brazil is the largest exporter of tobacco in the world, with over 20% of the world exports. In terms of total production, Brazil is second only to China. Brazil is well positioned to remain one of the top producers and exporters of tobacco because of the high quality of its product, low costs, high yields and technological innovation.

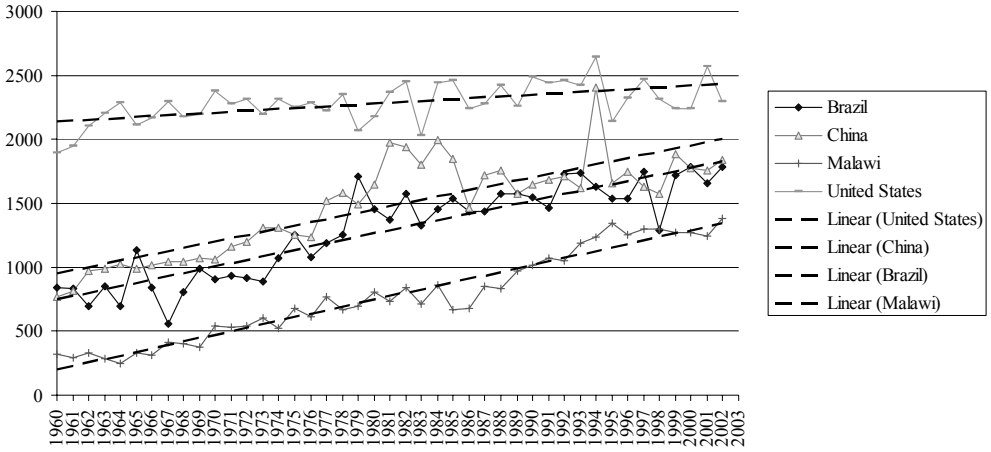
151. Tobacco is a relatively small product within the large Brazilian agricultural sector; however it provides income for a number of small agricultural producers. On average, tobacco is grown on farms of an average area of 16.8 hectares of which tobacco covers 2.5 hectares. As one of the few crops profitable on such a small area, tobacco provides an income four times greater than any other crop and uses family labour, which is more than 50% of the cost of production. In the crop year 1999/2000, tobacco related industries employ about 3.2% of the Brazilian workforce and production agriculture employs around a half million people (FAO, 2003).

152. As a major source of income with few alternatives, government efforts to move producers away from tobacco production have failed. In addition, the government does not provide direct support to tobacco in terms of minimum prices or non-recourse loans. However, tobacco farms are often eligible for production and investment credit at subsidised rates and price insurance because of their size and "family farm" status (FAO, 2003).

153. From the recommendations of major tobacco companies, Brazilian tobacco producers have substantially increased their tobacco yields (see figure 32). From the 1980s to the 2000s, production has increased by 3.5% per year, most of which has come from yield increases of 2.3% per year. Tobacco companies have provided, especially in the South, producers with improved cultivars and improved cultural practices. The tobacco companies, tobacco producer association and a university have created a public-private partnership to ensure tobacco is able to meet international export standards. This partnership also helped Brazilian producers improve the quality of their product to satisfy consumer concerns of nicotine levels and child labour. Brazil is recognised as a reliable producer of high-quality tobacco (FAO 2003).

Figure 32. Market sales to area planted

Kilograms per Hectare



Source: Author's calculations.

154. As a high-quality tobacco producer Brazil is a direct competitor of US tobacco. Brazil has replaced the declining production of the US and Zimbabwe increasing exports to China, Germany, Japan, Korea, Russia and countries in the Far East (FAO, 2003). The demand in Germany and Japan is beginning to plateau. China and the Far East are still growth markets suggesting a future for Brazil's tobacco producers. In the *Supply and Demand 2003* report of Universal Leaf Tobacco Company, Brazil was described as follows: "In some ways Brazil has now become to the industry what the United States was in the 1950's and 1960's, with manufacturers dependent on one origin for large export volumes that are much greater than those of the other exporting origins. Brazil's growth and dominance could only be slowed by dramatic cost increases, which could make the tobacco significantly more expensive, or a crop disaster, which would make manufacturers reflect on their exposure to one origin." (Universal, 2003, p.6).

China

155. China is the largest producer and consumer of tobacco in the world.[85] Through taxes and profits, the state-run tobacco industry generated around 15% of state revenue (see also OECD (2002)). Because the tobacco industry is owned and operated by the state, little product comes into or leaves China. Tobacco producers are also not as dependent on tobacco production as other countries. Tobacco is not the greatest revenue source for many Chinese tobacco producers (FAO, 2003).

156. Based on the work of the State Planning Committee, the State Tobacco Monopoly Administration (STMA) signs procurement contracts with tobacco producers. The contracts specify area of production; additionally, the contracts may specify input use and fixed prices for those inputs, which may be below market prices. The contracts are based on domestic demand for tobacco, so if demand for tobacco falls, the contracts require producers to grow other crops. As changes in Chinese market conditions have shown in the past, tobacco producers need little assistance to move from tobacco to other crops. These producers

85 . Therefore, overlooking China's potential role in international tobacco markets would be a significant oversight. This brief discussion will not explore the structural adjustment in China because from the analysis thus far China has not experienced major structural change or adjustment. However, as the case will reveal a major shift in Chinese interests in the global tobacco market could exert enormous pressure on other tobacco producing countries inducing even greater structural adjustment than has already taken place.

only need to adjust to domestic concerns; they, unlike the rest of the tobacco industry, are generally not affected by global market conditions (FAO, 2003).

157. In the recent past, China has exported less than 10% of its tobacco production; however, the exports from China are growing. In terms of imports, China has traditionally imported little tobacco, but this fact is also changing. Since its WTO accession, tobacco imports are permitted with an import licence although subject to an overall tariff of 17%. Because of the tariff, foreign cigarette brands are still relatively more expensive than local brands (FAO, 2003). Additionally, foreign brands have a different taste than Chinese brands. However some brands and tobacco leaves are entering the Chinese market. Some foreign firms have attempted to enter the large and growing Chinese market through joint ventures, but these efforts have been denied or slow in development (Lu, 2005 and Zamiska and O'Connell, 2005). In 2005, China introduced a new policy to prevent the construction of new cigarette factories including those from joint ventures (*Business Report*, 2005). In contrast, India has recently opened its market to receive FDI (see Box 9).

Box 9. FDI in India

After over a decade of negotiations, Philip Morris International Inc. has succeeded in getting a licence to grow and market tobacco crop in the country and export it in a joint venture with Gunter. The Guntur company has also developed TSN (tobacco specific nitrosamines) free tobacco hybrids. TSNs are the most harmful and carcinogenic constituents of the cured tobacco crop.

FDI opponents in India argue that foreign companies will destroy domestic tobacco and cigarette companies and would only exacerbate the structural change. Supporters of FDI in tobacco welcomed the news, saying that competition in the domestic market would be good to the tobacco market and producers. The supporters point out that the number of bidders in the auction floors of the Tobacco Board over the years has fallen from 300 to below 20, and small traders have exited the auctions. Some argue that competition is dead on the auction floors of the Tobacco Board. The FDI supporters believe that the introduction of Philip Morris will modernise Indian tobacco production with new hybrids produced, improved quality and increased yields.

Source: Business Standard (2004)

Malawi

158. Malawi, a relatively small Southern African country, is one of the top exporters of burley tobacco. Malawi is well positioned in the international tobacco market in part because it produces a burley tobacco with excellent 'filler' properties: low agro-chemical use and low nicotine. As a lower-quality tobacco, Malawi's product does not directly compete with the relatively higher quality burley tobaccos from the US and Brazil (Jaffee, 2003).

159. Malawi is heavily dependent on tobacco. In 1999, tobacco was the largest exported commodity and formed 6% of total GDP and 17% of agricultural GDP (FAO, 2003).[86] The tobacco sector (production, processing, transport, etc.) employs 1-1.2 million persons, which is about 20% of the total labour force of 5 million. In tobacco growing regions, tobacco sales make up the bulk of rural household cash incomes between 65% and 95% (FAO, 2003).

160. Because of Malawi's great dependence on tobacco and the possibility of a downturn in the tobacco market, concern exists for the future of Malawi. Both FAO (2003) and Jaffee (2003) suggest that Malawi is well suited for changes in the tobacco market but that it has also shown signs of a weakened

86. Jaffee (2003) estimates that the tobacco's share of GDP was around 13%.

tobacco industry.[87] Additionally, both noted that Malawi needs to find export alternatives. In the Trade Policy Review of Malawi, the WTO (2002) noted that crop diversification is a part of the government's Poverty Reduction and Growth Strategy. However, finding alternative crops is not always easy (see Box 10).

Box 10. The challenges of alternative crops

Tobacco…yields higher net returns per unit of land than most other cash crops, and substantially more than food crops. Currently, there are a few specialized crops in various areas that provide similar incomes, but it is estimated that these crops would not remain remunerative if total production increased. The economics of alternative crops is generally based on experiments carried out on a limited area at research stations under optimal conditions. More detailed research work is needed on a wider scale at farmers' field level before firm recommendations can be made about them. In general, under farmers' field conditions, most other alternative crops…are currently not as remunerative as tobacco.

Source : FAO, 2003

161. The challenge of finding alternative crops to tobacco in developing countries has not been of importance up to now because the structural change in tobacco markets has permitted growth in tobacco marketing from developing countries. The structural change in tobacco markets may not be over though. The consumption of tobacco products is still increasing, but globally, the growth is slow. The slow growth is, in part, the result of the international community exerting pressure to discourage the consumption of tobacco products. If tobacco consumption falls in developing countries, as has been the case for developed countries, what will happen to tobacco producers?

162. As has been suggested earlier, Brazil has improved its quality and increased its quantity such that it is a recognised producer of tobacco. Even if tobacco consumption falls, Brazil is expected to remain a major producer of tobacco. China, a small player in the global market up to now, may play a more important role in the global market. Producers in China do appear to be capable of moving to other crops as demand changes take place and thus may be able to adjust to changing markets quite smoothly. Countries like Malawi, however, are potentially in a challenging position because tobacco plays a major part of the economy and would have a difficult time adjusting if tobacco demand begins to fall. Even if the demand for tobacco does not fall, climatic shocks or the rise in production of a competitor could cause a major disturbance in the market opportunities for Malawi. As stated by FAO (2003), "Should tobacco farmers need to diversify into other crops, they are likely to suffer economic hardship." Not only will the tobacco producers suffer but so will the entire economy. Therefore, the effort by the Malawian government and donor agencies to help diversify the economy of Malawi is an important step in their structural adjustment in the midst of structural change.

87. For example it is estimated that the price of Malawi tobacco fell by 22% from 2004 to 2005. Robbie van Ensburger, a South African auctioneer on the Lilongwe tobacco auction floor told the *Guardian,* "'Prices have fallen 50% in the past 10 years and this year has reached an almost historic low." (Vidal, 2005, www.guardian.co.uk).

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ANNEX

Types of Tobaccos and Cigarettes

Types of Tobacco

- Burley: Light air-cured tobacco cured under natural atmospheric conditions, usually without the use of supplementary heat (except to prevent damage in damp weather). Usually medium in body, light tan shaded toward red to reddish brown in color, mild in flavor. Used mainly in cigarette blends. Burley is desired because of its flavor and aroma. Burley is also used in pipe tobaccos and plug and twist chewing tobaccos.

- Flue-Cured: Tobacco cured under artificial atmospheric conditions by process of regulating the heat and ventilation without allowing smoke or fumes from the fuel to come in contact with the tobacco.

- Oriental: A type characterized by a strong aromatic leaf that is sun-cured (sometimes referred to as Turkish). The plant is usually small with a large number of short leaves. Oriental is used mainly in cigarettes.

- Dark-Air & Sun-Cured: Dark tobacco types cured under atmospheric conditions, usually without the use of supplemental heat. The air-cured is shaded during curing, the sun-cured is not; usually medium to heavy in body and used in pipes, cigars, homemade and native cigarettes, snuff, and chewing tobacco. The only dark-air and sun-cured tobaccos to enter international trade in significant quantities are the cigar types.

Types of Cigarettes

- American-blend cigarette is a blended cigarette which is made with a mixture of flue-cured, burley, and oriental tobacco. The specific percentage of each type varies from brand to brand but, generally, flue-cured is around 50 percent of the blend while oriental constitutes around 12 percent.

- Dark cigarette is a blended cigarette made almost exclusively of dark air-cured tobacco and is sometimes referred to as "black cigarettes."

- English-blend cigarette is a blended cigarette made almost entirely of flue-cured tobacco. Also known as Virginia cigarettes.

- German-blend cigarette is a blended cigarette similar to American-blend cigarettes, but which uses more oriental tobacco. Also, these cigarettes have a milder taste because the tobacco is not as heavily cased and flavoured as American-blend cigarettes.

- Oriental-blend cigarette is a blended cigarette made almost exclusively of oriental tobacco (Dimon Incorporated, 2005).

Source: FAS/UDSA and Dimon Incorporated (2005)

3. TELECOMMUNICATIONS

Executive Summary

Introduction

The case that follows addresses structural change and adjustment in the telecommunications sector. This sector has experienced profound change over the last two decades. Deregulation and re-regulation have resulted in more open and competitive markets. Trade and investment liberalisation for both telecommunications service providers and telecommunications equipment manufacturers have stimulated trade and economic activity. The liberalisation of world markets for telecommunications services has been a remarkable success story yet the telecommunications sector has experienced adjustment which has changed labour composition over time. Starting with a cross-country study on the global telecommunications sector, this study looks closely at the sequencing issue with references in particular to experiences in **Argentina**, **India** and **Morocco**.

Key points

- Employment in former telecommunications monopolies has dropped in the last two decades but new hires by new telecommunications companies have made up for much of these job losses. While net job losses have been moderate, the composition of the workforce has changed drastically within the sector: old and low-skilled labour has rapidly been replaced by young and high-skilled labour.

- Trade liberalisation in the telecommunications sector has been significant: 35 percent of global outgoing international traffic was open to competition in 1990 when the Uruguay Round negotiations were being undertaken. In 2005, this figure was expected to have surpassed 85 percent.

- The voluntary commitments on basic telecommunications services that were offered in the late 1990s in the WTO have aided the adjustment process and facilitated global integration in the telecommunications sector. The trade negotiations preceding these new commitments offered both incentives and peer pressure for WTO members to open up their telecommunications markets to competition. The commitments helped to lock in liberalisation progress that had already been made and sustain the liberalisation process which was under way. Commitments by regulators not only facilitated foreign participation but also reduced the risk of regulatory reform reversals which increased the incentives for further investment in the sector.

- Another outcome of the WTO negotiations was the creation of a 'Reference Paper' which established a number of regulatory principles, or best practices, that countries could choose to commit to. These principles provided guidance for the liberalisation process which was particularly useful since different countries had adopted different liberalisation strategies and experienced very different outcomes.

- Beside technological change, competition has proven to be the most effective agent of adjustment in the telecommunications sector. However, an independent and competent regulator is paramount to derive the full benefits from competition. Privatisation without effective regulation has not necessarily improved service levels. The establishment of independent regulatory authorities prior to privatisation has had a positive effect on investment in infrastructure, telephone penetration and the stock market valuation of incumbents. It is always a challenge to achieve effective regulation and

independent regulatory institutions, but this is especially the case for developing countries with limited technical and financial capacity.

- Countries which have awarded exclusivity contracts to former state-owned monopolies following privatisation have suffered from relatively slow growth in subscriber levels. A reform process in which an incumbent is given too much time to "adjust", or consolidate, often strengthens the incumbent's market power. Effective change has best been achieved when competition has been introduced directly to the core business, as in fixed line services, rather than solely to adjacent areas, such as mobile services.

- The Moroccan case showed how the sequence of reform of first establishing a regulatory authority followed by the introduction of competition and then privatisation worked well. The mobile telecommunications sector experienced phenomenal growth while lack of competition in the fixed line business resulted in only a moderate increase in the subscriber level. In Argentina, long exclusivity periods awarded to privatised regional monopolies and a weak regulatory authority resulted in slower growth in fixed line subscriber levels than in some other comparable countries.

- In India, the modest reform process in the 1990s produced rather disappointing results. It was not until an independent regulatory authority with a clear mandate was established towards the end of the decade that the reform process was pulled in the right direction. Growth in subscriber levels took off after competition was introduced a few years later.

- The least developed countries that are managing to expand their networks rapidly are doing so with the help of multiple service providers. A number of developing countries have maintained or increased employment following liberalisation, in particular in countries with low tele-densities where most investment is directed toward labour intensive work of building fixed line and mobile networks. The disability of many developing countries to hone contractual agreements following privatisation and to establish independent regulatory institutions are issues which have proven particularly difficult to address.

- Telecommunications liberalisation pursued in parallel with policies which stimulate the supply of venture capital and provide incentives to further investment in human capital would help a country to take advantage of new ICT-related business opportunities. New ICT-intensive industries have been created in several countries with reliable and cost-effective communication services, including developing countries like India, Morocco and the Philippines.

Background

163. Telecommunications services have many attributes which can affect the performance of a country's economy. Telecommunications services are used both for final consumption and as intermediate inputs in manufacturing and services sectors. From a trade perspective, telecommunications has the dual role of being a mode of delivery and a directly traded service. Entire service industries, such as call centres, and business practises, such as internet retailing and international supply of business process services, are dependent on their reliable and cost-effective supply.

164. Telecommunications services help to disseminate and diffuse knowledge which generates economy-wide benefits. Cost-effective and efficient communication can reduce transaction costs and stimulate economic activity: e.g. competitive telecommunications markets facilitate job creation in the IT industry and benefit communication-intensive sectors such as transport, logistics, distribution and finance. Governments early acknowledged the value of telecommunications services to the general public and strived for universal service provision at affordable prices. This first took the form of state monopoly provision but the last decades have witnessed a fundamental shift toward provision through regulated competition.

165. Although the telecommunications sector accounts on average for less than one percent of total employment in OECD economies, revenue from telecommunications services equals approximately 2-4 percent of GDP.[88] It is traditionally a capital-intensive industry with considerable network externalities and it has been affected by frequent changes in technology and product and process innovation over the last two decades. Consumption of mobile services tends to grow faster than income while consumption of fixed line services tends to grow slower than income. Services can be supplied on a cross-border basis, through consumption abroad, or through commercial presence.

166. This case study focuses on two main aspects of structural adjustment. It first analyses adjustment provisions incorporated in trade and investment policies and experiences following market liberalisation in the telecommunications sector. It then presents country experiences and studies good practices of implementing adjustment policies particularly in developing countries. The analysis is centred on the telecommunications services sector with occasional references to the telecommunications equipment sector. These two sectors are closely related to each other and both sectors have during the last decade been affected by new WTO agreements and initiatives: telecommunications services by the Fourth Protocol of the GATS and the Reference Paper; and telecommunications equipment by the Information Technology Agreement. The paper starts by presenting industry characteristics and the main causes and effects of structural change in the telecommunications sector.

Adjustment in the telecommunications sector

Technological change, deregulation and trade liberalisation started reshaping the telecommunications sector in the 1980s and 1990s…

167. Twenty years ago, telephone calls were made from fixed lines provided by public telecommunication operators (PTOs). Most PTOs operated as monopolies and were treated as public services providers.[89] Their services usually covered the provision of a limited number of standardised services using standardised telecommunications equipment. Today, there is plenty of choice in terms of

88 See e.g. Blondal and Pilat (1997) and Lenain and Paltridge (2003).

89 . The investments needed to establish universal telecommunication networks were often of a magnitude so large that most governments viewed PTOs as natural monopolies.

service providers and means of communication, including e.g. voice or video-conference calls from fixed line telephones, mobile telephones, or from portable or desktop computers. The quality of transmission has greatly improved and prices have drastically been reduced. A month of unlimited access to a bundle of services such as national fixed line telephony, high-speed internet and digital television are in many countries offered at the same price as a 30 minute transatlantic telephone call only two decades ago.

168. As this example illustrates, the development of new technologies in the telecommunications area has helped reduce costs and widen the choice of means of communication. Deregulation, first initiated in the United States in 1982 when the long distance market was opened up to competition, also had a profound effect on price and quality of telecommunications services. The choice of telecommunications standards, in particular for mobile services, has affected penetration rates and foreign direct investment. Despite varying degrees of scope and pace of implementation around the world, transparent, simple and symmetric regulations promoting competition has helped transform the global telecommunication market.

169. This trend towards a liberalised telecommunications market has mainly been driven by domestic policy considerations and deregulation initiatives have generally been of a non-reciprocal and non-discriminatory nature. However, two plurilateral trade initiatives within the WTO have played a significant role. WTO commitments on Basic Telecommunications Services were starting to be implemented in 1998 and committed participating countries to open their telecommunication services markets and adhere to a set of regulatory principles. Consumers of telecommunications services also greatly benefited from the WTO Information Technology Agreement (ITA) which was implemented in the last years of the 1990s and required participating countries to eliminate tariffs on information technology (IT) products. These two WTO initiatives have helped produce more competitive and international markets and create new business opportunities in developed and developing countries. Several countries have also gone even further in their effort to facilitate market entry, attract foreign direct investment (FDI) and strengthen consumer protection. In terms of permitting and facilitating adjustment, these developments have had a huge impact on the structure of the telecommunications sector.[90]

…which resulted in changes in the demand for certain telecommunications workers

170. Between 1982 and 1995, total employment levels in OECD country PTOs fell by approximately 10 percent (OECD, 1997).[91] An OECD (1995) report concluded that the most important factor affecting employment in the telecommunication sector was technological change. Network expansion was no longer a primary driver of employment. Process and product innovation was instead affecting employment as networks were technically upgraded. The intelligence built into the networks reduced the demand for jobs related to network expansion, modernisation, maintenance and operation. At the same time demand increased for workers with technological competence and workers in the managerial, professional, sales and marketing fields (OECD, 1995; ILO, 1998) (See Box 11).

171. While the overall number of workers in the service industry slightly declined, the adjustment within the sector itself and its occupational structure were substantial and reflected a shift in demand from low-skilled to high-skilled workers (OECD, 1997). The change in demand for occupational categories did not only reflect changing technology but also the shift from supply driven to primarily demand driven organisations. And despite the gradual decline of employment within PTOs, new jobs were increasingly created in market entrants in a growing support industry providing the same services on a sub-contractual

90 . See ITU World Telecommunication Development Report, OECD Information Technology Outlook and OECD Communications Outlook for a comprehensive discussion of the latest trends in the telecommunications sector.

91 . Total employment in the sector may have fallen by less than the observed fall due to outsourcing of services by the main telecommunications operators (Blondal and Pilat, 1997).

basis. This development held for developed and developing countries alike although the transformation started affecting different countries at different points of time. Countries that resisted change were likely to aggravate the adjustment pressure: e.g. a report by the European Commission (1996) concluded that countries that prohibited infrastructure competition were losing jobs due to technological change while missing out on the prospective gains from job creation in new market entrants.

Box 11. Changing labour composition in telecommunications markets

PTT Netherlands provides an illustration of the changing educational structure of PTO employment. During the first four years of the 1990s, total employment grew by 7 percent. However, there were rapid declines in the shares of employees with primary education (-30 percent), primary professional education (-26 percent) and secondary education (-35 percent) while the share of employees with secondary professional education (51 percent), higher professional education (35 percent) and university degree education (33 percent) increased rapidly (OECD, 1995). A study by Garrone and Sgobbi (2001) of the Italian market between 1986 and 1995 confirmed this trend of skill substitution but also found that there was a marked reduction in the average age of employees. Older workers increasingly made way for younger workers with more training. The share of PTO employees of up to 40 years of age increased from 22 percent in 1986 to 46 percent in 1995. These changing patterns are illustrative for the sector at large.

Another round of adjustment was initiated in the early 2000s following shifting consumer preferences and reduced investment in telecommunications equipment

172. Communication preferences have changed and diversified over time. While standard fixed line telephony is still widely used, new means of communication and add-on services have been introduced, including mobile telephony and voice over Internet Protocol (VoIP) services, Short Text Messaging (SMS) and Multimedia Message System (MMS). Mobility, digitisation and internet connectivity are transforming the way people communicate and since 2001 there are more individual mobile subscribers than there are fixed line subscribers in the OECD area (see Figure 33). Since 2002, there are also more mobile subscribers per capita than there are fixed line subscribers in developing countries.[92] These shifts have forced companies to adopt new business models and quickly acquire new competence within their organisations.

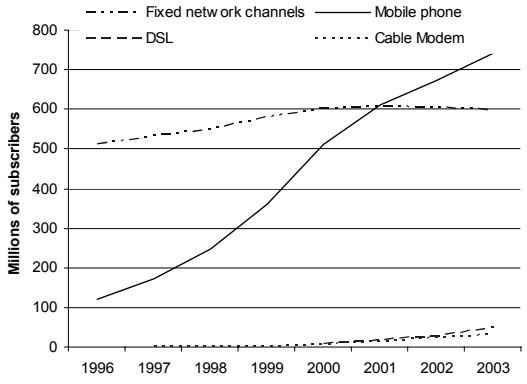
173. Service operators throughout the world acquired foreign assets in the 1990s following a general relaxation of FDI rules. Several countries also auctioned off Universal Mobile Telecommunications System (UMTS) licences which helped trigger a peak in investment in 2000. Investment in public telecommunications in the OECD area had doubled between 1994 and 2000 while services revenue grew modestly or not at all during the following three years (see Figure 34). Many service operators were heavily indebted and responded by aggressively cutting operating costs and investment in telecommunication equipment. This helped trigger a depression in the telecommunications equipment sector (See Box 12). However, several developing countries were not affected by this outcome and rather expanded their telecommunications networks and rapidly increased the number of subscribers from relatively modest levels.

174. While the boom and bust in the telecommunications sector mainly affected the equipment manufacturing industry, employment effects also hit the service sector. Despite the last decade's rapid transformation of the telecommunications sector, most telecommunications employees in the OECD area still work in the fixed line services business (Figure 35). The industry reached a peak in employment in 2000 followed by a marked decline of 18 percent over the subsequent three-year period. However, at the

92. See www.itu.int/ITU-D/ict/statistics/ict/index.html.

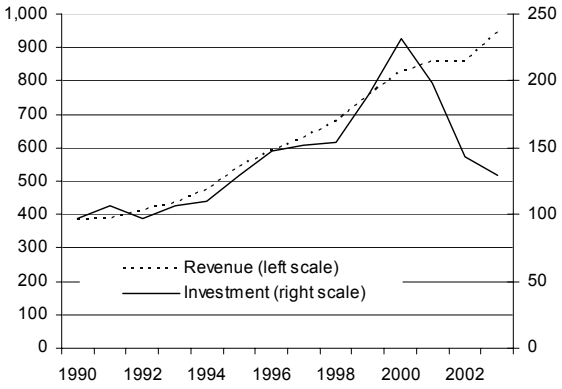
same time, the number of mobile services employees increased by 32 percent. Despite this increase in mobile services employment, the total number of telecommunications services workers declined by almost 13 percent. The case of the United States paints a somewhat similar pattern: the mobile services market suffered least during the recent downturn. Employment was cut in the fixed line business with sharper cuts in the equipment manufacturing industry (see Figure 36).

Figure 33. New technologies and means of communication in the OECD area, 1996-2003



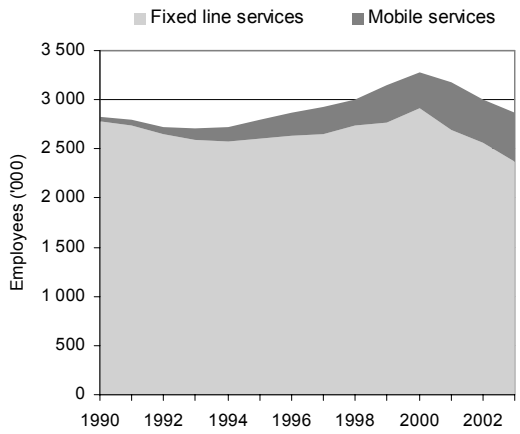
Source: OECD (2005a)

Figure 34. OECD public telecommunication revenue and investment, 1990-2003 (USD billion)



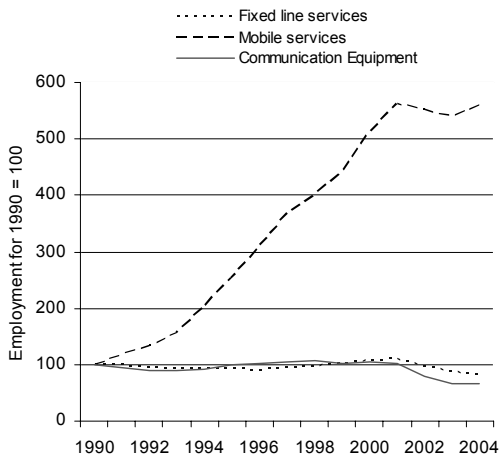
Source: OECD (2005a)

Figure 35. OECD telecommunications services employment trends, 1990 – 2003



Source: OECD (2005a)

Figure 36. United States telecommunications employment trends, 1990 – 2004



Source: OECD (2005a)

175. The work redundancies incurred in 2001-2003 created strains in certain regions and communities where large numbers of workers entered the labour market over a relatively short period of time. The adjustment process in the equipment manufacturing sector is significant not only because of its sheer size and short timeframe but also because so many of the workers who lost their jobs were highly educated and well paid. A study by Lenain and Paltridge (2003) towards the end of the crisis concluded that market

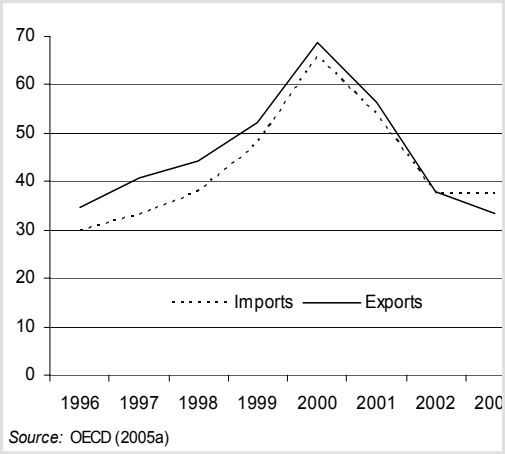
forces had helped correct the imbalances in the telecommunications sector in 2001-2003. However, the authors noted that regulators had a role to play in facilitating adjustment. For example, legal provisions for debt negotiations could facilitate, or fasten, debt restructuring; technology-neutral regulation could bring added benefits such as inter-modal competition; and regulatory monitoring and flexibility was needed to safeguard competition.

Box 12. Structural adjustment in the telecommunications equipment sector

Purchases of telecommunications equipment dropped by more than 40 percent in 2000-2003. As a result, revenue of the top 250 communications equipment manufacturers dropped from USD 232 billion to USD 159 billion (OECD, 2004). Trade in telecommunications equipment declined by roughly 50 percent in the OECD area and exports contracted somewhat more than OECD imports (see Figure 37). The trend was very different in developing countries where imports and exports of telecommunications equipment grew by 9 percent and 43 percent respectively between 2000 and 2003.[93]

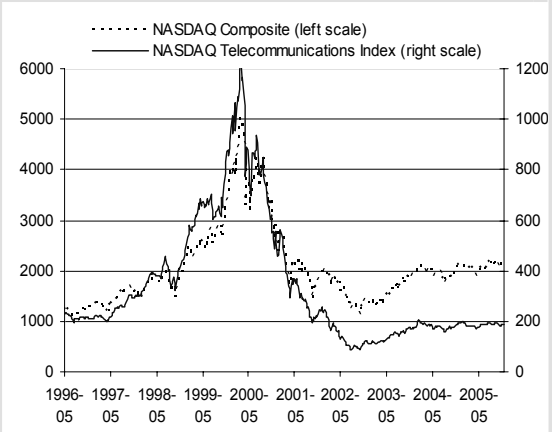
Taken together, these developments affected corporate profitability: the top 250 companies in the communications equipment industry recorded a net income of USD 9 billion in 2000 but lost USD 40 billion only two years later (OECD, 2004). This helped trigger a stock market crash from which the equipment manufacturing industry has not yet fully recovered: e.g. the NASDAQ Telecommunications Index was in mid-2005 around a sixth of its peak in 2000 (see Figure 38).

Figure 37. OECD trade in telecommunication equipment, 1996-2003 (USD billion)



Source: OECD (2005a)

Figure 38. NASDAQ telecommunications index, 1996-2005[94]



Source: NASDAQ and www.econstats.com

The world-wide drop of investment in telecommunications infrastructure forced equipment manufacturers to cut capacity, move production to lower-income countries predominantly in Asia, reduce investment in research and development (R&D) and cut overhead costs. Between 2000 and 2002, the top 250 companies in the communications equipment industry reduced their workforces from 867,000 to 564,000 (OECD, 2004). For example Alcatel, Ericsson, Lucent Technologies, Marconi and Nortel Networks reduced their workforces by 52-72 percent in 2000-2004. Other companies like Cisco Systems, Nokia and Samsung did better and reduced their workforces by less or even increased their number of employees. Despite the fact that some staff reductions were attributed to corporate spin-offs, domestic sub-contracting and voluntary early retirement schemes, a large share of the reductions caused unemployment. Fortunately the downturn in the telecommunications sector has been reversed and it is again expanding and hiring new workers.

93. UNCTAD Handbook of Statistics.

94. The graphs are based on weekly closing prices. The NASDAQ Telecommunications Index uses a broad definition of telecommunications, see http://dynamic.nasdaq.com/reference/IndexDescriptions.stm.

Adjustment in the telecommunications sector: experiences from three countries

176. This part of the analysis presents the experiences of three countries' liberalisation effort in the telecommunications services sector. Morocco, India and Argentina have sequenced their reform initiatives differently and experienced different outcomes. The case studies show that when markets are subject to effective regulation and competition, positive adjustment takes place with accelerating subscriber growth.

(1) Liberalisation in the Moroccan telecommunications sector[95]

177. Morocco started to reform its telecommunications sector in 1997 following the enactment of Law No. 24-96 which separated telecommunications operations from postal operations. It also established the National Telecommunications Regulation Agency (ANRT) with responsibility to monitor the liberalisation of all branches of the telecommunications market. The ANRT was considered North Africa's most independent regulator which inspired confidence for investment. In May 1999, a reform programme was introduced to open up the country's telecommunications sector to competition, to support the drafting of a new regulatory framework, to prepare the privatisation of the incumbent Maroc Télécom and to extend access to telecommunications services to the most under-privileged sectors of the population. This adjustment programme was aided by USD 200 million in financial support from the World Bank and the African Development Bank (ADB).

178. A new private mobile telephone licence was granted in August 1999 and in March 2000 the mobile telephone market became a duopoly. Imminent competition made Maroc Télécom lower tariffs four times in one year. The number of subscribers rose quickly from 0.15 million at the beginning of 1999 to 5.5 million by the end of 2001 exceeding the average growth forecasts by bidders for 2010. Mobile services were soon made available in many areas of Morocco which lacked access to fixed line services.

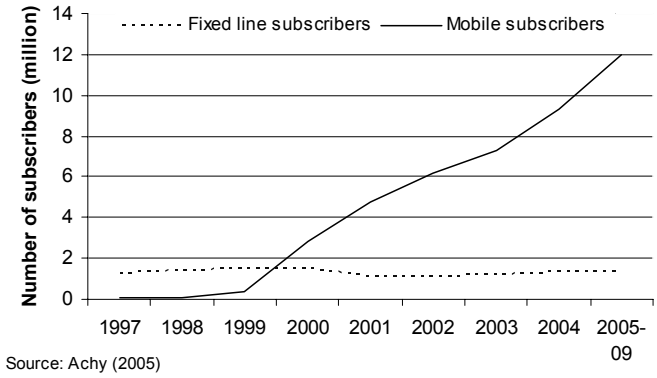
179. A second reform programme was introduced in August 2000 to consolidate the initial progress, improve competition in services and infrastructure, and to increase use of IT. This programme was also financially supported by the ADB and the World Bank. In January 2001, 35 percent of the incumbent Maroc Télécom was sold to Vivendi Universal which acquired an additional 16 percent in November 2004. 14.9 percent were also sold to public and private investors in an IPO in December 2004. Following the privatisation, the number of employees in Maroc Télécom was reduced from 14,495 in 2001 to 12,204 by the end of 2004. However, the new entrant Médi Télécom had hired 710 people by 2005 – of which two-thirds had university diplomas – and created an additional 9,000 jobs in partner and sub-contracting companies. The productivity improvements following the opening up to competition affected the number of employees in the incumbent PTO but the total number of people employed in the Moroccan telecommunications sector grew rapidly.

180. The unilateral reform process was initiated and pursued in parallel with the multilateral and plurilateral commitments made under the WTO General Agreement on Trade in Services. Morocco participated in the basic telecommunications negotiations which started in 1996 and its commitments were annexed to the Fourth Protocol of GATS in February 1997, coming into effect in January 1998. The initial commitments were limited covering only mode 1 and mode 2 supply of value added services but they were subsequently improved in October 2000 to cover all modes of supply and included the 'reference paper'. Morocco also signed the WTO ITA. Following the reform process, telecommunication subscription exploded for mobile services from 2000 onwards as Figure 39 indicates. Mobile penetration exceeded 40 percent of the population in late 2005. In addition to the unilateral, plurilateral and multilateral initiatives, Morocco also signed FTAs which cover telecommunication services, including the Morocco-United States

95. This section is based on Achy (2005), annual reports of Vivendi Universal, Medi Télécom's website, Rosotto (2003), Wellenius and Rosotto (1999) and WTO (2003).

FTA. The International Telecommunications Union (2002) hails Morocco as a success story since the country's reform path helped it move from having North Africa's lowest telephone access level to its highest.

Figure 39. Telephone penetration in Morocco, 1997-2005



Source: Achy (2005)

181. While growth in mobile subscribers expanded rapidly the fixed line sector developed slowly. In 2000, the average waiting time for a new fixed line was 5 months and subscriber numbers didn't grow until 2003 when demand for internet connection gathered pace. Incidentally, 2003 was the year that Maroc Télécom lost its exclusive right to provide fixed line voice services. Contrary to Morocco's earlier WTO commitments, this exclusive right expiring 31 December 2002 was granted to Maroc Télécom when the company went public and had negative implications in terms of subscriber growth and stability of the liberalisation timetable.[96]

182. The easy and cost-effective access to mobile services has had a substitute effect to fixed line services. The lack of competition – until very recently – in the fixed line business has kept prices high. This illustrates some of the potential drawbacks of liberalising one type of service while protecting another, especially since internet usage also was dependent on fixed line services. In April 2002, the ANRT issued an invitation to tender for the granting of a second fixed line licence but the agency received no offers. The new prospects of competition in the fixed line market starting in 2006 pushed Maroc Télécom to recently improve its offers and the number of internet subscribers roughly doubled in 2005. In July 2005 a second fixed line licence was successfully issued to a private telephone company.

(2) Liberalisation in the Argentinean telecommunications sector[97]

183. Argentina started to introduce competition in mobile telephony through a presidential decree in 1988. More thorough reform of the telecommunications sector began in the early 1990s. The incumbent ENTel (Empresa Nacional de Telecommunicaciones) was first divided into two companies: Telefónica de Argentina S.A., serving the north of the country; and Telecom Argentina S.A., serving the south of the country. These companies were then sold to mainly foreign agents: 60 percent of Telefónica de Argentina was sold to Telefónica of Spain, CEL Citicorp Holdings and Techint; and 60 percent of Telecom Argentina was sold to France Telecom, Italy's Stet SpA, Morgan and Pérez Companc. An additional 10 percent was

96. Argentina had a somewhat similar experience following privatisation and granting of an exclusivity period to the incumbent (ITU, 2002).

97. Based on ILO (1998), Cowhey and Klimenko (2001), Yahoo Finance.

also allocated to ENTel employees and 5 percent to telephone cooperatives which operated in poorer regions. The Buenos Aires market was split between the new operators.

184. The privatisation of ENTel was a long and difficult process which faced considerable resistance among certain civil servants, trade unions and political parties. Operating licences were awarded with exclusive rights to provide basic telephone services for seven years, with an extra three years depending on the attainment of a number of operational targets. Additional companies controlled by the new regional monopolies were created with a similar 7+3 years agreement: Telintar for international services; Startel e.g. for data and mobile services; and Miniphone for cellular mobiles.[98] The privatisation of the two monopolies did accelerate growth in mainlines in 1989-1994, compared to the previous five-year period, but growth significantly lagged a country such as Chile which had both privatised and introduced competition in its telecommunications sector (Wellenius, 1997).[99]

185. In 1993, Argentina was the only large country in South America to avoid all commitments on value-added services in the Uruguay Round's initial agreement on telecommunications. However, in 1996, Argentina created the Comisión Nacional de Comunicaciones (CNC) from existing federal bodies with the aim to ensure continuity, regularity and equality of services and to promote universal services at fair and reasonable prices through effective competition. The move was followed by a major rebalancing of phone rates: international rates had been relatively high while domestic rates had been relatively cheap. The high international rates dampened demand and encouraged call-back services. The new regulatory agency corrected some of the regulatory deficiencies in the former system of highly decentralised agencies.

186. One year later, Argentina made a market access offer in the WTO including foreign ownership or control of telecommunications services and facilities from 2000 onwards; guaranteed market access for satellite services and facilities starting in 1999; and guaranteed pro-competitive regulatory principles.[100] Services other than voice services were opened up to competition. The new international commitments in 1997 fostered considerable activity: the General Interconnection Regulation was passed in January 1997 and the Basic Telephone Services Decree in March 1998. In November 1997, the two regional monopolies were awarded the extra three-year licence of exclusive services provision in line with the initial agreement. However, only five months later, the CNC announced that it would allow the entry of two new basic service providers in November 1999. The CNC also agreed to liberalise voice telephony aiming at achieving full competition by November 2000. Following this shift in policy, licences were granted to CTI and Movicom as mobile operators, and Impsat, Kedata and Comsat as long distance and international services operators.

187. The creation of the regulatory agency CNC and the introduction of competition have helped to modernise the Argentinean telecommunications market. By the end of 1997, Telecom Argentina achieved

98. These three companies were dissolved in 1998.

99. The experiences of moderate fixed line subscriber growth in Morocco and Argentina following the awarding of exclusivity contracts for monopoly provision are hardly unique. Wallsten (2000) studied the privatisation of 20 telecommunications companies in 15 developing countries and found two-thirds of the countries chose to allocate exclusivity periods for an average of 7.4 years. The reason was simple: by granting a monopoly in fixed local services more than doubled the price investors paid for the companies. However, the author estimated that a one percent increase in the length of the exclusivity period was associated with a 0.05-0.08 percent decrease in network growth. Li and Xu (2002) also found negative effects in a larger sample of 116 countries. Between 1981 and 1998, the impact of exclusivity periods on the number of fixed lines and mobile subscribers was negative and significant.

100 . According to Bouzas and Soltz (2005), "…Argentina's GATS offer was seen as a mechanism to send a strong signal of commitment to economic reform and to 'increase the costs' of future policy reversals.", and "to provide 'an anchor to domestic reform' and to 'prevent a return to protectionist policies'".

full digitisation following USD 5.2 billion in investment. Telefónica de Argentina achieved the same target in June 1998 following USD 6.37 billion of investment. The two former license monopolies have continued to dominate the telecommunications market even after the introduction of competition in 2000. This is partly because of the long period of time they had to integrate their various activities in basic local services, long-distance national and international services, mobile telephony and data transmission services. The exclusivity period granted during the privatisation may have increased the price the Argentinean government received from investors but it may also have negatively affected the expansion of the network and distorted the market in the medium term.

188. The digitisation of the telecommunications network helped increase productivity sixfold. The telephone density also increased by 130 percent to 26 lines in service per 100 habitants between 1990 and 2001. The number of employees reduced in the former incumbent was large: it dropped from 35,000 employees in 1990 to 20,100 employees in 2000 when full competition was introduced. However, many of these workers were reabsorbed by companies controlled by, or linked to, the licensees and by other companies in the sector. In 2004, the two groups of the former state monopoly employed around 24,000 people. The level of education among employees rose drastically. The percentage of professionals in the staff of Telecom Argentina with a primary or incomplete school background was reduced from 57 percent in 1990 to 12 percent in 2001. At the same time, the percentage of university educated professionals increased from 6 percent to 42 percent.

(3) Liberalisation in the Indian telecommunications sector[101]

189. A first attempt to reform the Indian telecommunications sector began in 1991 following a balance-of-payments crisis which led to the opening up of exchange-level switch manufacturing to the private sector. Indian telecommunications services and products had until 1991 been provided by a state-owned monopoly organised as a division in the Department of Telecommunications which was part of the Ministry of Communications. This move did not help in attracting FDI mainly due to the small size of the Indian market, local content requirements and the services incumbent's monopoly position in procurement. Other early reform initiatives were equally ineffective. Licenses for service provision were offered for mobile services in 1992 and fixed line services in 1994 which would have changed the market from a monopoly to a duopoly. However, a bidding process requiring prospective new entrants to pay up-front fees led to a bidding war. The winners of the bidding process defaulted because of the high up-front fees. Neither did the National Telecom Policy of 1994 lead to any significant change and years passed without noticeable improvements in the Indian telecommunications sector. Foreign ownership of telecom operators were allowed up to 49 percent of capital, but as the new license holders defaulted there was no real entry.

190. Following the setbacks in the modest attempts to initiate a reform process during the 1990s, it became increasingly clear that more thorough reforms were needed in order to address the issues of the underperforming telecommunications sector and meet the demand. An independent and statutory regulator TRAI (Telecom Regulatory Authority of India) was established in 1997 but a long period of power struggle followed between the new regulator and the Department of Telecommunications, where the latter won some key cases in court. The conflicts undermined the credibility of the regulator during the initial years of liberalisation in India. However, some moderate success was achieved in allowing private providers of data traffic in 1998.

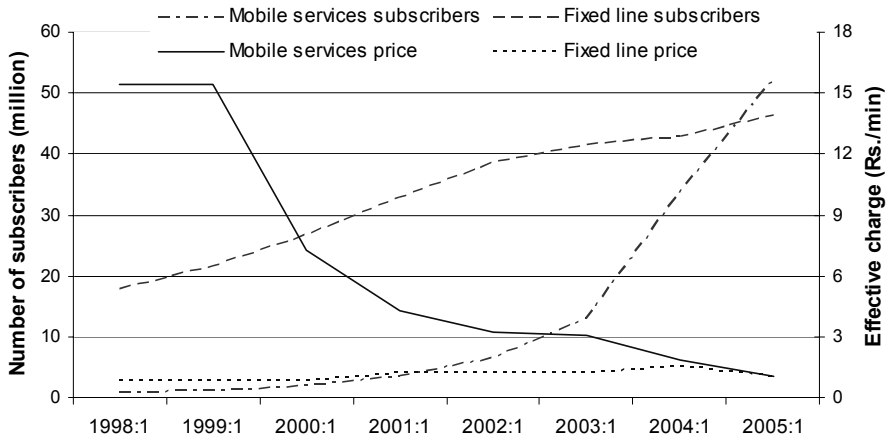
191. Despite the difficulties associated with convincing trade unions, the state incumbent and many other interested parties, the Indian government managed to pass 'The National Telecom Policy 1999' by the end of the decade due to top political support. This new policy made private service provision possible

101. Based on chapters in Dossani (2002), Hossain and Kathuria (2003), TRAI (2005) and The Economist (2005).

by: a) strengthening the mandate of TRAI (further strengthened in 2000); b) scrapping the hitherto policy of demanding high up-front fees for licenses and instead awarding franchises (revenue sharing agreements); and c) allowing new private entrants to be put on par with the state-owned incumbent. In addition, in 2000 the state incumbent was incorporated and TRAI declared that it was technology-neutral, which eased the highly contentious issue about local content requirement in fixed line equipment. A major rebalancing of telecommunications tariffs was carried out by TRAI in 1999 and two new entrants in 2001 and 2002 increased competition in the mobile services market and some competition was also introduced in the fixed line sector (see Figure 40).

192. The reform process in India was long and riddled with difficulties but by the turn of the century, India finally managed to address many of the issues that had plagued the reform process. Tele-density has since then grown rapidly. During the fifty years preceding 1998, the country achieved a tele-density of 1.9 percent with 18 million fixed line subscribers and less than a million mobile subscribers. Between March 1998 and March 2005, the number of fixed line subscribers increased by 28 million of which 18 percent was generated by private operators. During the same period, mobile subscribers increased by 51 million of which 85 percent was generated by private operators[102]. By the end of 2005, India had more than 65 million mobile subscribers and this figure was growing by 3 million a month. In June 2004, India also had the world lowest call charges per minute in the mobile services sector. The ceiling for foreign ownership was increased from 49 percent to 74 percent in the fall of 2005 and soon afterwards Vodafone acquired ten percent of Bharti Tele-Ventures in what was billed as India's largest ever foreign investment (see Box 13 for an illustration of the link between telecommunications services and the new opportunities of developing country provision of IT services and business process services).

Figure 40. Indian growth in subscriber base and price, 1998:1-2005:1



Source: TRAI (2005)

102. This type of rapid growth has not been unique for India. ITU (2002) mentions countries like Togo, Benin, Uganda and Madagascar as other cases where tele-density remained very low for many decades but increased manifold after 1995.

Box 13. Telecommunications services and export opportunities for developing countries

Reliable telecommunications services and FDI friendly policies have helped create new export industries in labour intensive and capital scarce countries with well trained graduates. The Indian IT services (ITS) and business process services (BPS) industry delivers services through ICT networks – which initially were special cable networks connecting major IT hubs – and currently employ more than one million workers (Nasscom, 2005). In the year ending March 2005, India exported USD 17.2 billion worth of ITS and BPS. The Philippines is another developing country which is quickly establishing itself as a global champion of voice-based BPS. In 2005, figures from the Philippine government indicated that the supply of ITS and BPS was worth USD 2 billion and the industry employed around 100,000 call centre workers. The country's early and complete liberalisation of the telecommunication sector translated into a competitive advantage in providing these services as investment in telecommunications equipment improved quality and competition drastically reduced prices (OECD, 2006 forthcoming).

These new industries are entirely dependent on reliable and cost-effective supply of telecommunications services. But India and the Philippines would not have managed to take advantage of the opportunity if it was not for their investment in tertiary education. OECD (1995) emphasised more than a decade ago that the developments in the telecommunications market would have implications for government policy in education and training not only to provide the necessary skills for their PTOs to compete in global markets, but also to satisfy the increasing need for ICT skills across the economy. These recommendations were mainly targeted to OECD countries. However, as the Indian and Philippine cases show, they are just as relevant for developing countries.

Trade and investment policy in the service of adjustment

193. The WTO covers some agreements and initiatives which specifically concern the telecommunications sector. The Information Technology Agreement (ITA) covers telecommunication equipment and the General Agreement on Trade in Services (GATS) includes an annex on telecommunications services with a protocol on commitments on basic telecommunications services, and a reference paper on regulatory disciplines. These commitments were initiated to liberalise and increase competition in the telecommunications sector. Because of differences in the level of ambition among WTO Members, both the ITA and the Fourth Protocol of GATS were initiated on a voluntary basis and implemented following commitments by members representing a critical mass of world trade/revenue.

(1) WTO Information Technology Agreement

194. The ITA is a voluntary, or plurilateral, initiative to liberalise trade in IT products. It provides a binding mechanism to eliminate tariffs on a set of predefined IT products and it also provides a review mechanism of non-tariff barriers.[103] ITA participants abide by some basic principles. First, all products listed in the ITA Declaration *must* be covered and reduced to a zero tariff level.[104] Second, all other duties and charges (ODCs) on imports of these products *must* be bound at zero and there are no exceptions to product coverage. The benefits of these commitments then accrue to all WTO Members because of the most favoured nation (MFN) provision.[105]

103. The review mechanism is managed by the Committee of Participants on the Expansion of Trade in IT Products

104 The average tariff of these products in non-ITA members was 14 percent in 2002 (Bora, 2004).

105 According to the MFN principle, a country must treat imports from a country on the same basis as that given to the most favoured other nation. In effect, this means that with some exceptions, every country gets the lowest tariff that any country gets, and reductions in tariffs to one country are provided also to others.

195. The ITA entered into force on 1 April 1997 when 40 WTO participants covering 90 percent of world trade in IT products agreed to sign the declaration (see Table 1).[106] This group has subsequently expanded and most new member states acceding to the WTO have signed the agreement, including China. As of 1 January 2006, the ITA had 67 participating members accounting for 97 percent of world trade in IT products.[107] Approximately one-fifth of this trade in IT products is made up of telecommunications equipment (Bora, 2004). Argentina, Brazil and Mexico are the three largest traders of IT products among the group of WTO members which are not ITA participants.

196. During its implementation phase, the ITA provided for the staging of concessions in equal rate reductions over a period stretching from 1 July 1997 to 1 January 2000. A number of developing country participants requested and received extended staging beyond the initial deadline of 2000 for at least some products in their schedule. India, for example, joined the ITA on 25 March 1997, bound all of the 217 tariff lines covered by the ITA and committed to eliminate tariffs on 95 lines in 2002, 4 lines in 2003, 2 lines in 2004, and 116 lines in 2005.[108] No extended staging period was allowed beyond 2005 for the original signatories.

197. Developing countries that have opted not to take part in the ITA have raised three types of concerns: a) trade tax revenue implications; b) reduced infant industry protection; and c) doubts about its usefulness due to their relatively low volume of trade in IT products (Wunsch-Vincent, 2005). However, tariffs (and non-tariff barriers) raise the price of ICT equipment which negatively affects the use of ICT and reduces the positive externalities associated with ICT investment. Tariffs discourage FDI since all non-participants have relatively small domestic markets and trade protection also impedes any country's prospects of being integrated in the ICT industry's global production chain. In addition, rapid technological change in IT product markets renders the infant industry argument weak, if relevant at all.

(2) WTO General Agreement on Trade in Services

198. Multilateral commitments on trade in telecommunications services were first negotiated in the Uruguay Round and resulted in the **Annex on telecommunications** of the General Agreement on Trade in Services (GATS). This annex requires each WTO Member to ensure that all service suppliers seeking to take advantage of scheduled commitments are accorded access to and use of public basic telecommunications on a reasonable and non-discriminatory basis.

199. The annex provides some relief to developing countries as it states that *"…a developing country Member may, consistent with its level of development, place reasonable conditions on access to and use of public telecommunications transport networks and services necessary to strengthen its domestic telecommunications infrastructure and service capacity and to increase its participation in international trade in telecommunications services."*[109] An important feature of the annex is that it provides a commitment for progressive liberalisation. It also presents a number of recommendations which encourage cooperation between developed and developing countries, and the participation of developing countries and their suppliers of public telecommunications services in the development programmes of international and regional organisations. Other recommendations concern the use of international standards and technology transfers to least developed countries.

106 Hoekman and Kostecki (2001) also refer to the ITA as a zero-for-zero agreement. See www.wto.org/english/tratop_e/inftec_e/inftec_e.htm for further information.

107. WTO (2005) G/L/756, WTO (2005) G/IT/1/Rev.36 and consultations with the WTO Secretariat.

108. See Wunsch-Vincent (2005) and Government of India: http://commerce.nic.in/wtoit_2.htm.

109. www.wto.org/english/tratop_e/serv_e/12-tel_e.htm

200. WTO negotiations continued following the completion of the Uruguay Round and the creation of GATS. These negotiations resulted in the **Fourth Protocol of the GATS** which entered into force on 5 February 1998. It included commitments on basic telecommunications services offered by 69 WTO members. In January 2006, this number of members scheduling commitments had increased to 105 (See Table 6). The Protocol provides schedules of specific commitments regarding market access and national treatment of foreign telecommunications providers.[110] The commitments cover cross-border supply (GATS mode 1), consumption abroad (mode 2) and commercial presence (GATS mode 3) (WTO, 1998).

201. The implementation of the schedules depended as in the case of the ITA on participation by countries accounting for a critical mass of world trade in the covered services. The participants could specify which segments of the services sector they wished to open up to foreign competition, including local, long-distance, international and mobile telecommunications services (Blouin, 2000). Schedules with commitments for particular countries and services were phased in and implemented at specified dates in the future.

202. In addition to the Fourth Protocol of the GATS, a document called the **Reference Paper** was created and attached to WTO Members' schedules of commitments on a voluntary basis. It includes regulatory disciplines such as commitments on competitive safeguards, interconnection, independent regulation, transparent licensing procedures and non-discrimination. It also leaves significant scope for regulatory autonomy, explicitly allowing e.g. universal service requirements. The main objective of the Reference Paper is to address the issue of the dominance of incumbent PTOs and ensure that competitive conditions are created. Blouin (2000) has noted that the lifting of formal entry barriers was insufficient to ensure actual market access given the strength of the traditional national operators in their domestic markets and their control over essential facilities such as the local telecommunications network.

203. In February 1997, 63 of 69 governments submitting schedules on basic telecommunications included commitments on regulatory disciplines, with 57 of these committing to the Reference Paper in full or with minor modifications[111]. The Reference Paper provides policy makers with valuable guidance on how to introduce sustainable competition in telecommunications markets. It also locks in commitments related to the regulatory disciplines a country may wish to undertake. Participation allows for less than full reciprocity and commitments can be implemented over a pre-defined time period.[112]

(3) The role of WTO commitments in adjustment

204. OECD countries and many emerging markets have opened up their telecommunications sectors to competition and various degrees of foreign ownership. While liberalisation in the telecommunications sector has brought significant welfare benefits, the reform process has often received significant opposition from incumbent PTOs and trade unions. The implementation of reform policies including privatisation and introduction of competition involved changes which incumbent PTOs sometimes had strong incentives to resist. Many PTOs initially argued that competition would jeopardise the universal service "contract" and their financial and political influence was applied to decelerate the reform process (OECD, 1997).

110. See www.wto.org/english/tratop_e/serv_e/telecom_e/workshop_dec04_e/wk_prog_dec04_e.htm for a thorough review of the schedules.

111. www.wto.org/english/tratop_e/serv_e/telecom_e/telecom_history_e.htm. Bolivia, India, Morocco, Pakistan, the Philippines, Turkey and Venezuela did not include the whole document (Blouin, 2000).

112. See Hendersen et al. (2005) for a discussion regarding some of the challenges and consequences of developing country commitments to the GATS Fourth Protocol and Reference Paper.

205. One increasingly common approach to facilitate and sustain the reform process has been for governments to enshrine their market liberalising moves in treaty-level commitments, notably in the context of the WTO's schedules on basic telecommunications services (ITU, 2002). The WTO negotiation process has helped offering incentives and applying pressure on countries to open their telecommunications markets to competition; to lock in progress; and to convince interest parties that the gains from competition are greater than the potential asset and market share losses for incumbents. Hoekman and Kostecki (2001) have pointed out that many developing countries used the negotiations on basic telecommunications as a "pre-commitment device" to bind themselves to introduce competition in the future. This approach reflected a general recognition among many developing countries that liberalisation was in their interest and that WTO provided a useful mechanism to guarantee and proceed with future liberalisation.[113]

206. The negotiations on basic telecommunications enhanced the ability of national regulators to convince markets that reforms were unlikely to be reversed. This is particularly important since regulators' ability to commit to a certain reward structure for a regulated firm is essential in creating reasonable investment incentives. When a regulator's commitment is weak or lacks credibility, the regulated companies limit their investments in network equipment and operating licenses or demand higher returns on capital because of the associated risk. The WTO has thus been a mechanism through which countries have been able to make credible commitments to future changes in regulation: e.g. many Latin American and Central and Eastern European governments used the WTO commitments on basic telecommunications for this purpose. Cowhey and Klimenko (2001) also argue that the change in the international telecommunications regime will have some major implications: the commitments on basic telecommunications services will e.g. influence the terms of accession of new WTO members and change the expectations of economic agents which will regard countries with poor regulatory transparency and competition as especially risky.

207. Figure 41 and 42 demonstrate how the markets for mobile and fixed line telecommunication services have evolved over time in the OECD area. From the entry into force of the GATS in 1995 to the entry into force of the schedules on basic telecommunications services in 1998, the number of fixed line markets with open competition increased from 27 percent to 73 percent. During the same time the number of monopoly markets providing mobile services was reduced from eleven to zero. In 2004, Turkey – with the last remaining monopoly in the OECD – opened its fixed line market to competition (OECD, 2005a). The two figures show that several countries had started to liberalise their telecommunications markets and that these liberalisation initiatives accelerated during the course of negotiations and following the implementation phase of basic telecommunications commitments. Data show that 35 percent of global outgoing international traffic was open to competition in 1990. In 2005, this figure was expected to have surpassed 85 percent (Kelly, 1999).

113. See Mattoo (1999) for a review of developing country pre-commitments in basic telecommunications.

Figure 41. Market structure of fixed networks in the OECD area

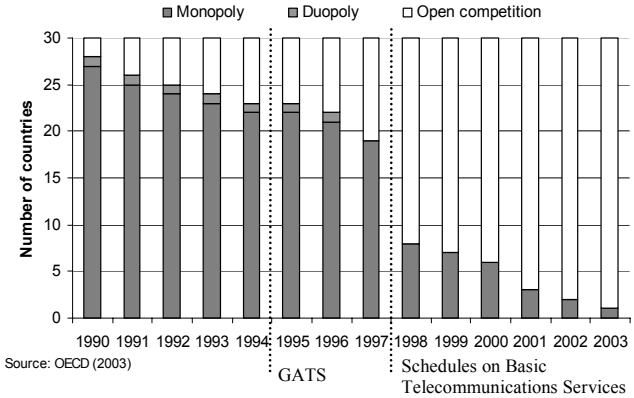
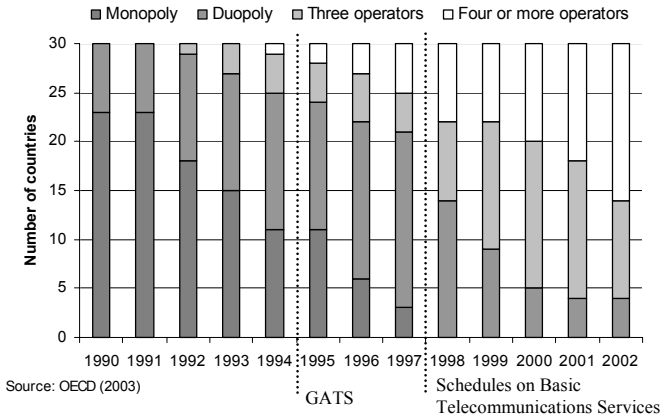


Figure 42. Market structure of mobile networks in the OECD area



208. As this sectoral study shows, successful implementation of regulatory reform in the telecommunications sector can bring significant improvements to quality and prices of telecommunications services. But the approach to deregulation and sequencing of reform may also have a considerable effect on the outcome. The WTO initiatives that have been reviewed above offer voluntary participation. For example the Reference Paper provided guidance for the liberalisation process to those countries that were ready and committed to open up their telecommunication services markets to foreign competition. The reform process was locked in and reform measures implemented over an extended period of time to facilitate adjustment.

209. WTO members that opt not to offer commitments enjoy the benefits from liberalising countries' commitments through the MFN provision yet they miss out on the prospective benefits from domestic liberalisation. Nevertheless, they may also draw on other countries' experiences as they have access to a wealth of information on regulatory reform, including in the Reference Paper. Several developing countries have received funding and technical assistance from multilateral bodies for their reform process. This is important since not only reform but also the sequencing of reform measures does have an impact on a country's ability to improve its telecommunications markets and smooth adjustment. While a multilateral approach to telecommunication liberalisation would be more beneficial to the global economy, the voluntary approach may yet be a second best approach.

Table 6. WTO initiatives regarding the telecommunications sector[1]

	Information Technology Agreement	Schedules on Basic Telecommunications Services	Reference paper on Basic Telecommunications
Entering into force	1997-04-01	1998-02-05 [fourth protocol]	1998-02-05 [fourth protocol]
Number of original members scheduling commitments	40	69 [fourth protocol]	63 [fourth protocol]
Number of members having scheduled commitments in January 2006	67[2]	105	78 in full or with minor modifications 7 adopted in part
Critical mass criteria	Participating countries had to cover 90% of world trade for the agreement to be implemented	"Critical mass of telecommunications market"	
Coverage	Approximately 97% of world trade	Approximately 90% of world revenue	
Main objective	Binding and elimination of tariffs and other duties and charges on IT products	Progressive liberalisation of trade in telecommunications services	Offer regulatory disciplines as a way of safeguarding market-access commitments
Staging of concessions	Basic staging for original participants until 2000-01-01; extended staging for sensitive items until 2005-01-01 for developing countries. Staging available for new participants.	An implementation date, if applicable, was specified for certain commitments in the schedules concerned.	
Acceptance of new signatories/participants	Yes	N.A. (new commitments through accession or the DDA)	N.A. (new commitments through accession or the DDA)
MFN principle	Yes	In principle yes but exemptions were allowed if explicitly stated	Yes
Binding commitments	Yes	Yes	Yes
Review/consultation mechanism	Periodic review or consultation of non-tariff barriers and product coverage		

[1] Input was offered by the WTO Secretariat in March 2006.

[2] Albania, Australia, Austria, Bahrain, Belgium, Bulgaria, Canada, China, Costa Rica, Croatia, Cyprus, Czech Republic, Denmark, Egypt, El Salvador, Estonia, France, Finland, Georgia, Germany, Greece, Guatemala, Hong Kong, China, Honduras, Hungary, Iceland, India, Indonesia, Ireland, Israel, Italy, Japan, Jordan, Korea, Kyrgyz Republic, Latvia, Liechtenstein, Lithuania, Luxembourg, Macao, China, Malaysia, Malta, Mauritius, Moldova, Morocco, Netherlands, New Zealand, Nicaragua, Norway, Oman, Panama, Philippines, Poland, Portugal, Romania, Saudi Arabia, Singapore, Slovak Republic, Slovenia, Spain, Sweden, Switzerland, Chinese Taipei, Thailand, Turkey, United Kingdom and United States

Differentiation and sequencing of the reform process

210. Governments should seek, to the greatest extent feasible, to pursue policy reforms in parallel because successful adjustment often depends more on the interaction of policies than on the effects of individual policies (OECD, 2005b). However, as this section will show, certain reform policies may best be implemented with consideration to sequencing. While no single blueprint for sequencing exists, a particular sequence of reform may be more appropriate than another. Some reform policies may also need to be differentiated between developed and developing countries due to different economic and institutional capabilities.

Market openness and pro-competitive regulation improve telecommunication sector performance

211. The economic benefits of liberalisation and regulatory reform in the telecommunications industry are relatively large and quickly realised. Some benefits are derived from adjustments triggered by the mere prospect of liberalisation but the depth and scope of adjustment depend on the establishment of effective competition (Boulaud and Nicoletti, 2000). An empirical study by Rosotto et al. (2003) looking at the determinants of telecommunication sector performance found evidence that market openness and pro-competitive regulation improve telecommunications sector performance. The study suggested strong linkages between export performance in manufacturing, participation in global production networks, attractiveness to FDI and the performance of the telecommunications sector. Boylaud and Nicoletti (2000) also found that increasing product market competition generally brings productivity and quality improvements – even when controlling for the influence of technological developments – and reduces the price of telecommunications services.

212. Empirical work by Wallsten (1999) has shown that competition is the most effective agent of change, privatisation without regulation may not improve service levels, and regulation is key to effective privatisation of PTOs (see also Auriol, 2005). Mattoo et al. (2001) also found evidence in a sample of 60 countries for the period 1990-1999 that openness to trade in telecommunications services influences a country's long-run growth performance. In high-income countries there is evidence that greater market openness encourages expansion of telecommunications networks at lower cost, while improving the efficiency of incumbent operators and lowering the costs of services to ICT-using sectors (Boylaud and Nicoletti, 2000). International evidence also suggests that open telecommunication markets and the quality of the regulatory regime are drivers of ICT sector development (OECD, 2000).

213. When competition for telecommunications services was authorised in the Philippines in March 1995, the number of fixed lines increased from 1 409 million to 5 786 million two years later. Most of the increase was due to investment by new market entrants (Cowhey and Klimenko, 2001).

Sequencing of reform may significantly affect the adjustment outcome

214. There are three basic ingredients for telecommunications reform: privatisation, competition and independent regulation; and according to ITU (2002) "…*the difference between fast and super-fast growth is often the quality and timing of reform"*. Progressive liberalisation of markets is a key objective in the GATS and it allows schedules to take different forms and be gradually implemented (Mamdouh and Tuthill, 2004). New entrants have gained significant market share in liberalised telecommunications markets – in particular for mobile services – but the regulatory starting point has proven to affect the outcome. For example the United States chose to separate local access from long distance service provision following the liberalisation of its long distance market. This resulted in relatively quick gains of market share of new market entrants because these companies were competing on more equal terms as the incumbent lacked direct access to subscribers (OECD, 1997).

215. The UK chose a different policy of moving gradually from a monopoly to a duopoly and then increasing the number of competitors further. This policy resulted in a much slower rate than in the United States of transfer of market share between incumbent and new entrants. In general, in the mobile services sector, liberalisation proceeded faster than in fixed network infrastructure partly because of the lack of strong incumbents. But a slow and gradual approach may impede growth: several studies have concluded that market openness has had a significant effect on the growth of mobile telecommunication subscribers (OECD, 1997; ITU, 2002). Among OECD countries, the relative growth of mobile subscribers was 1:2:3 in monopoly, duopoly and open markets (OECD, 1997).

216. Without real competition, the benefits from increased private participation are generally not fully realised (Wellenius, 1997). For example, labour productivity growth in the UK was weak in the immediate aftermath of privatisation but labour productivity doubled in the 1991-1995 when market entry was liberalised (Blondal and Pilat, 1997). Innovations also appear to have expanded more strongly in countries where the industry was privatised and made subject to competition. Delays in the introduction of competition may adversely affect performance even after competition is eventually introduced. This finding is in line with the less positive results from exclusivity periods granted to newly privatised PTOs in e.g. Argentina and Morocco. A process in which an incumbent is given too much time to "adjust" may only strengthen the monopolist's market power and provide it more time to consolidate its position.

217. In a panel dataset covering 200 countries from 1985-1999, Wallsten (2002) found that countries which established regulatory authorities prior to privatisation experienced increased telecommunications investment and telephone penetration compared to countries that did not. In a subset of 33 countries, the author also found that investors paid more for telecommunications companies in countries where a regulator was established prior to privatisation. In a dataset of 86 developing countries for the same period, Fink et al. (2002) found that both privatisation and competition lead to significant improvement in performance but a comprehensive reform programme involving both policies produced larger gains. The authors further noted that competition should precede or be introduced in parallel with privatisation rather than the other way round.

218. According to Bortolotti et al. (2002), financial and operating performance of telecommunications companies improves significantly after privatisation. Panel data of 31 fully or partly privatised companies in mostly developed countries (between 1981 and 1998) show that much of the improvement results from regulatory changes – either alone or in combination with major ownership changes – rather than from privatisation alone. For example, the authors found that competition reduces the companies' profitability, employment and efficiency after privatisation. The creation of an independent regulatory agency increased output and the mandating of third party access to an incumbent's network was associated with a significant decrease in the incumbent's investment and an increase in employment.

219. Incomplete introduction of competition in the MENA region (e.g. Lebanon and Egypt) has brought some progress in their telecommunication sector performance but bottlenecks related to the inefficiency and resistance to change in the incumbent operators remain (Varoudakis et al., 2002). Effective change has best been achieved by introducing competition directly to the core business of providing fixed line services, and not only by offering licences for new mobile network operators. The authors also concluded that telecommunications liberalisation pursued in parallel with policies to stimulate the supply of venture capital and provide incentives to develop human resources would help a country to take advantage of new ICT-related business opportunities.

Developing country issues

220. The telecommunications sector is of great importance to developing countries: Fuss et al. (2005) estimates that for developing countries, a ten percent increase in mobile tele-density boosts economic growth by 0.6 percent, which is similar to that of fixed-line tele-density in developed countries in the 1970s. Almost all least developed countries (LDCs) that manage to rapidly expand their networks are doing so with the help of multiple operators (ITU, 2002). Competitive mobile markets in developing countries can relieve fixed line incumbents of some of the pressure related to long waiting time for new connections. The combination of mobile communications, competition and prepaid cards has been a success in LDCs, many of which are experiencing unprecedented growth in telephone access. In 1991, total telephone penetration (fixed and mobile networks) stood at 49.0 percent in developed countries, 3.3 percent in emerging market countries, and 0.3 percent in LDCs. A decade later, the corresponding levels were 121.1, 18.7 and 1.1 and growth was highest in the LDC group.

221. In Africa, mobile telecommunications has acted as a competitive force encouraging fixed-line providers to improve access (Hamilton, 2003). But results are ambiguous: consumers may treat mobile and fixed line networks as both substitutes and complements, even when fixed-line penetration is low. In the case of South Africa, lower-income households treat mobile phones as a substitute for fixed lines while higher-income households treat the two as complements (Hodge, 2005).

222. A number of developing countries have maintained or increased employment in their liberalised telecommunications sectors. In countries with low tele-densities, roughly 70 percent of telecommunications investment is directed toward the labour-intensive work of building fixed line and mobile networks (Hoekman et al., 2002). Market characteristics do matter: the authors refer to a paper which found that in 26 Latin American and Asian economies, telecommunications markets with competition were the only ones that consistently increased their employment levels. Two-thirds of the countries with monopolies saw considerable declines in the telecommunications workforce.

223. Table 7 shows that employment in the telecommunications sector increased between 1995 and 2000 across all country income groups. The telecommunications sector experienced significant regulatory and technological change during this five-year period. The table shows that productivity increased markedly in terms of average number of main lines per employees ─ especially in poorer countries ─ and that international traffic expanded rapidly too.

Table 7. Telecommunications statistics

Type of country	Telecommunication staff (thousand)		Average number of main lines per employee		Outgoing int. traffic (million minutes)	
	1995	**2000**	**1995**	**2000**	**1995**	**2000**
Low-income	902	934	38	69	1868	2413
Lower-middle-income	1444	1621	73	126	4977	6892
Upper-middle-income	650	684	139	203	6361	10154
High-income	2359	2582	195	210	50156	96389

Source: ITU (2002)

224. The case studies in this chapter have shown that the establishment of an independent regulator is key for countries to fully realise the benefits from competition. Technological change has greatly increased productivity in the telecommunications sector and continues to do so. Telecommunication monopolies are not likely able to both protect jobs and provide cost-effective services. Competition does help provide growth in subscriber levels and cost-effective services. However, competition needs to be properly

regulated and this is arguably the real weakness in countries with weak institutions and a scarcity of human resources. Developing countries may lack documented market information which makes the regulator's role even more challenging.

225. Auriol (2005) has pointed out that developing countries which used to control prices and production in the telecommunications sector through public ownership have been unsuccessful in establishing regulatory institutions. Weak legal, regulatory and institutional frameworks are not unique for the telecommunications sector in developing countries. But their importance is paramount (See Wellenius and Stern, 1994 for an extensive discussion regarding these issues). An issue resulting from weak regulatory capacity and political instability is related to credibility in the privatisation process. The frequent renegotiation of licenses awarded to private operators increases risk and hence distorts investment incentives. Agencies with technical expertise, assistance capacity and funds can, and do, play an important role in helping to create the proper regulatory environment in many developing countries as some of the previous case studies showed.

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4. CHEMICALS

Executive Summary

Introduction

The case study that follows addresses the structural change and adjustment in the chemical industry, focusing on petrochemicals. Rising oil prices, technological change, increased demand for petrochemical products in Asia especially China, have triggered a change in supply-demand patterns. While traditionally, chemical production was dominated by developed countries, Middle Eastern countries and Asian countries are increasing their presence as exporters. The rapidly growing Chinese market has been the main destination of these exports. It is clear that this sector will experience further changes in the global demand-supply structure as Middle Eastern and Asian countries continue to invest in new capacity, and China increases its self-sufficiency. Starting with a cross-country study on the global chemical industry, this study surveys experience in the **United States, Western Europe, Japan, Eastern Asia excluding China and Japan, China, Mexico and Saudi Arabia.**

Key Points

- The petrochemical industry experienced substantial structural adjustment triggered by high oil prices, changes in technology trends, and change of supply-demand structures in the 1980s and 90s. The United States, Western Europe and Japan underwent structural adjustment in different ways. Structural adjustment in the United States was market driven, while in Western Europe both market forces and government intervention played a role. In Japan, the government played a major role especially in the 1980s.

- The United States case highlighted how strong monitoring by financial markets can induce timely structural adjustment. Mature financial markets with private equity and leveraged buy-outs can also facilitate the reallocation of capital and speed up the process of structural adjustment. Many major chemical companies sold off petrochemical plants to domestic/foreign competitors or private equity firms, allowing these companies to focus resources on the specialty chemicals segments. Companies that bought these plants could make capacity reductions more readily because they had more choice on which plant to close.

- The European case illustrated how the structural adjustment process may be complicated when state-owned enterprises and private-owned companies coexist. State-ownership and/or prolonged state subsidies can hinder adjustment by cushioning industry from market forces. Industry associations can play a limited but useful role by providing benchmarking data on capacity and production trends. The creation of the Single European Market served both as a trigger for structural adjustment and as a facilitator of adjustment. FDI played an important role in adjustment as in other cases. The role played by FDI from Middle Eastern countries was especially noteworthy, illustrating how developing countries are using FDI to acquire technology and gaining market footholds in developed country markets.

- The case of Japan illustrated the potential dangers of direct government intervention in the structural adjustment process. While succeeding in reducing capacity to weather the storm in the 1980s, across the board capacity reductions supported by the government, allowed even relatively inefficient players to survive. Japan's case also showed how phased-in multilateral tariff reductions such as the Chemical Tariff Harmonization Agreement (CTHA) may serve as a trigger and timetable for structural adjustment, showing the benefits of making multilateral commitments.

- The Eastern Asia case illustrated how different countries developed their petrochemical industries with varying degrees of government involvement. FDI played a key role in all cases, and was most evident in the restructuring of the Asian petrochemical industry after the financial crisis. Considering the role FDI played in the restructuring process, there seems to be considerable merit in liberalising trade and FDI in a simultaneous manner. While the financial crisis may suggest that premature capital liberalisation has its dangers, liberalisation of FDI without allowing domestic companies to tap foreign capital may have the effect of disadvantaging domestic companies.

- China has used inward FDI to modernize its petrochemical industry which continues to be dominated by majority state-owned companies. At the same time, China's frequent use of anti-dumping duties to imports from around the world raises concerns, both because this may be an improper use of the multilateral trade rules, and because such protection may delay the structural adjustment process.

- Mexico and Saudi Arabia presented cases of countries with substantial advantages in natural resources. Saudi Arabia has successfully built up a petrochemical industry based mainly on exports through domestic investment and skilful use of FDI partners. Mexico has not been as successful; despite similar natural endowments, demand has been satisfied more through petrochemical imports than investment. Pemex, the state-owned petroleum/petrochemical company did not make substantial investments mainly because of lack of funds. Attempts to privatise its petrochemical business have failed because of domestic opposition. Subsequent attempts to find joint venture partners to make additional investments have not been successful. In terms of sequencing, the case of Mexico may indicate the desirability of removing domestic impediments to structural adjustment such as FDI restrictions in order to maximise the benefits of trade liberalisation.

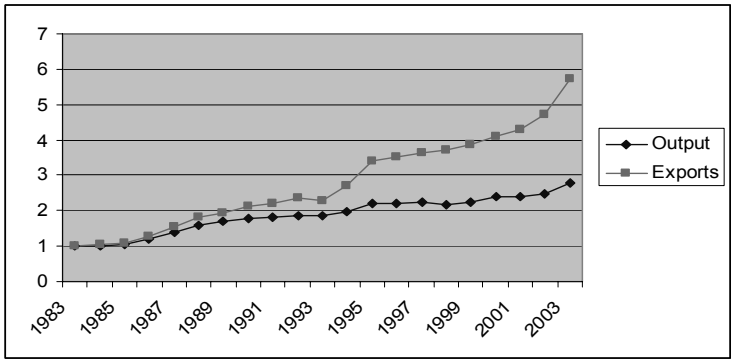
- Looking ahead, the major capacity additions by Middle Eastern countries and Asian countries and continued growth in China suggest that the current trend in supply-demand structure will continue. Oil/gas prices are expected to remain quite high, and the United States, Western Europe and Japan who have traditionally been exporters will see a further erosion of their export positions due to increased competition from the Middle East and Asia.

- Other factors such as environmental regulations and chemical safety may also affect industries' ability to adjust to structural change.

Background

226. The global chemical industry is a heterogeneous industry which includes, among other things, petrochemicals, basic inorganic chemicals, fertilizers, basic plastics, synthetic rubber, pharmaceuticals, specialty chemicals, detergents, and paints and coatings. It is essential to a broad range of manufacturing and agricultural industries with virtually every product – from synthetic fibres to automobiles – using chemical inputs.[114] The chemical industry ranks among the major manufacturing industries in any country, and global output has grown at an average 5.2% per annum in the past twenty years and to reach $ 1.9 trillion as of 2003 (see Figure 43). Chemical trade has outgrown production in the past 20 years at an average 9.1% per annum growth. $792 billion, or forty percent of output, is traded globally, accounting for more than 10 percent of world merchandise exports in 2003.

Figure 43. Global trade and output of the chemical industry



1. Global trade and output in dollars. 1983=1

Source : International Council of Chemical Associations.

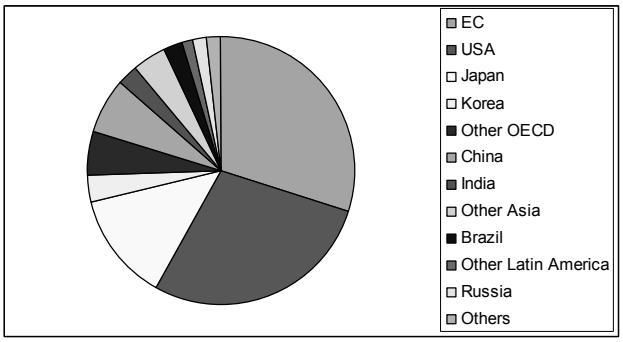
227. World chemical output is heavily concentrated in the "Big Three" – Western Europe, the United States and Japan, which constitute over two thirds of global output (Figure 44), and the Global top 50 companies are dominated by companies from the "Big Three". However, developing countries are playing a greater role, with developing countries' share in chemical exports increasing from 16.5% in 1990 to 20.7% in 2000 (see Table 8), with some companies such as Sinopec and PetroChina from China, Reliance from India, SABIC from Saudi Arabia, and Sasol from South Africa becoming more prominent in the global market (See Table 9).

228. Both chemical consumption and output in most economies have increased in step with their development and GDP growth. Being a growth sector, one may think that the chemical sector is unrelated to structural adjustment. However, a closer look reveals that technological change, changes in oil prices, and economic growth have affected supply and demand patterns, leading to major shifts in trade patterns, triggering substantial structural change. Declining tariffs and reduced impediments to investment, both in the chemical industry and in the user industries has spurred global and regional competition. Thus, despite a general increase in output, employment has been declining in some countries including OECD countries

114. For example, according to the American Chemistry Council, the chemical content of various goods would be as follows; paint (100), carpets (68), tyres (62), diapers (37), batteries (27), and motor vehicles (14).

and some developing countries, whereas they have increased in others. Privatization of former state owned enterprises[115] have also been a major feature in the restructuring.

Figure 44. Share in global output in chemicals (2001)



1. Output of 25 countries is calculated as 100%.
Source : Secretariat using data on top 25 major countries compiled by ICCA.

Table 8. Leading Chemical Exporters

(Percentage of World Exports)

	1980	1990	2000	2003
European Union (15)	58.4	59.0	52.3	55.7
Extra-exports	23.3	21.1	20.4	22.0
United States	14.8	13.3	14.1	11.5
Japan	4.7	5.3	6.0	4.9
Switzerland	4.0	4.6	3.8	4.3
China a	0.8	1.3	2.1	2.5
Canada	2.5	2.2	2.5	2.2
Singapore	0.5	1.1	1.6	2.1
domestic exports	0.2	0.7	1.1	1.7
re-exports	0.3	0.4	0.6	0.4
Korea, Republic of b	0.5	0.8	2.4	2.1
Taipei, Chinese	0.4	0.9	1.6	1.5
Russian Federation b	-	-	1.2	1.1
Saudi Arabia	0.1	0.8	0.7	0.8
Mexico a	0.4	0.7	0.9	0.7
India c	0.3	0.4	0.8	0.9
Malaysia a	0.1	0.2	0.6	0.7
Above 15	87.0	91.0	89.5	90.8

a Includes significant shipments through processing zones.
b Includes WTO Secretariat estimates.
c 2002 instead of 2003.
d Imports are valued f.o.b.
(Note) Total of percentages may be greater than 100 due to rounding up.
Source: Secretariat based on World Trade Organization; International trade statistics 2004 (Geneva)

115. The petroleum and petrochemical industries are closely linked (see paragraph 238) and often conducted by the same entity. Although at present, private companies dominate the chemical industry in developed countries, in most developing countries, and in many developed countries in the past, state owned enterprises continue to play a big role. SABIC in Saudi Arabia, Pemex in Mexico, PETROBRAS in Brazil, SINOPEC, CNPC, and CNOOC in the People's Republic of China are examples of state owned companies in this area.

Table 9. Global top 50 companies in 1999 and 2005

(Sales are in $ Millions)

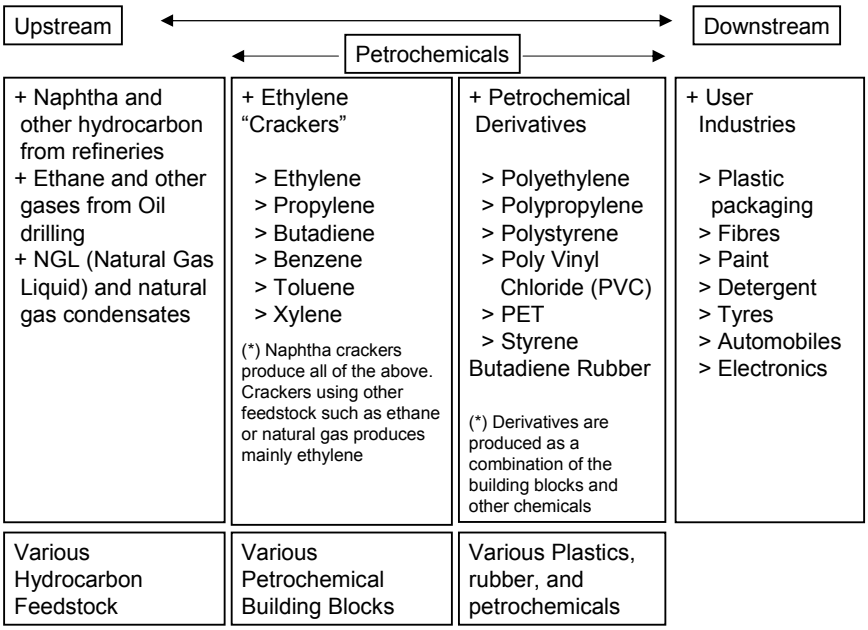
	1999			2005			
Rank	Company Name	Country	Chemical Sales	Company Name	Country	Chemical Sales	Rank in 1999
1	BASF	Germany	31250	Dow Chemical	USA	40161	4(28)
2	DuPont	USA	27688	BASF	Germany	38189	1
3	Bayer	Germany	20193	DuPont	USA	30130	2
4	Dow Chemical	USA	18600	Royal Dutch Shell	UK/Netherlands	29497	7
5	Exxon Mobil	USA	13777	Exxon Mobil	USA	27781	5
6	ICI	UK	13672	Total	France	24928	11(12)
7	Shell	UK/Netherlands	12886	BP	UK	21209	10
8	Akzo Nobel	Netherlands	12324	Bayer	Germany	18088	3
9	Degussa Huls	Germany	10086	China Petroleum and Chemical	China	16730	na
10	BP Amoco	UK	9392	Mitsubishi Chemical	Japan	16274	23
11	Total	France	9344	SABIC	Saudi Arabia	15901	32
12	Elf Acquitaine	France	9272	Degussa	Germany	13985	9
13	Sumitomo Chemical	Japan	8137	Formosa Plastics Group	Chinese Taipei	12627	47
14	Huntsman Corp	USA	8000	Akzo Nobel	Netherlands	11806	8
15	Mitsui Chemicals	Japan	7763	Huntsman Corp	USA	11438	14
16	Henkel	Germany	7325	Mitsui Chemicals	Japan	11350	15
17	Aventis	France	7090	Air Liquide	France	10714	21
18	General Electric	USA	6941	ICI	UK	10258	6
19	Solvay	Belgium	6792	Sumitomo Chemicals	Japan	9883	13
20	Dainippon Ink and Chemicals	Japan	6697	Toray Industries	Japan	9869	25
21	Air Liquide	France	6617	DSM	Netherlands	9642	22
22	DSM	Netherlands	6610	Equistar Chemicals	USA	9316	30
23	Mitsubishi Chemicals	Japan	6673	Dainippon Ink and Chemicals	Japan	9273	20
24	Clariant	Switzerland	6162	Chevron Phillips	USA	9238	50
25	Toray Industries	Japan	6134	Shin Etsu	Japan	8946	na
26	Ciba Specialty Chemicals	Switzerland	5973	General Electric	USA	8290	18
27	Rhodia	France	5887	Lanxess	Germany	1529	3b
28	Union Carbide	USA	5870	PPG Industries	USA	7309	29
29	PPG Industries	USA	5502	Asahi Kasei	Japan	7142	42
30	Equistar	USA	5436	BOC	UK	7095	
31	Rohm and Haas	USA	5339	Air Products	USA	7051	34
32	SABIC	Saudi Arabia	5330	Ineos Group	UK	7000	na
33	Monsanto	USA	5102	Clariant	Switzerland	6862	24
34	BOC	UK	4948	ENI	Italy	6738	43
35	Norsk Hydro	Norway	4727	Praxair	USA	6594	39
36	Novartis	Switzerland	4697	Eastman Chemicals	USA	6580	41
37	Reliance Industries	India	4654	Reliance Industries	India	6572	37
38	Air Products	USA	4654	Rhodia	France	6568	27
39	Praxair	USA	4639	Sasol	South Africa	6558	na
40	Celanese	Germany	4600	Solvay	Belgium	6524	19
41	Eastman Chemical	USA	4590	Rohm and Haas	USA	6471	31
42	Asahi Chemical	Japan	4555	Yara	Norway	6417	35
43	ENI	Italy	4364	LG Chem	Rep of Korea	6309	na
44	Borealis	Denmark	4334	Syngenta	Switzerland	6030	na
45	Honeywell/Allied Signal	USA	4007	Lyondell Chemical	USA	5968	48
46	Roche	Switzerland	3860	Borealis	Denmark	5756	44
47	Formosa Plastics	Chinese Taipei	3729	Ciba Specialty Chemicals	Switzerland	5653	26
48	Lyondell	USA	3693	Teijin	Japan	5287	na
49	SKW	Germany	3609	Nova Chemicals	Canada	5270	na
50	Chevron	USA	3544	Celanese	USA	5069	40

(*Source* : Chemical and Engineering News July 18, 2005 and July 24, 2000)

229. Structural adjustment in the chemical sector has not surfaced as an issue as much as other sectors, in part because of the diversified nature of the chemical industry which allows for decreases in some sub-sectors to be compensated by increases in other sub-sectors. The high levels of education of employees in this sector may also be a factor.[116] In most cases, companies have been the drivers of structural adjustment, changing composition of their product lines through mergers and acquisitions, divestitures, and joint-ventures accompanied by restructuring of production capacity and personnel.

230. In this paper, we will focus on the petrochemical sector which remains the most important segment of the industry, constituting roughly 50% of the chemical sector in major countries. Petrochemicals refer to the sub-sector of the chemical industry which manufactures various chemicals from oil (e.g. naphtha) or natural gas (e.g. ethane)[117] (See Figure 45).

Figure 45. The petrochemical industry



231. We will first look at some characteristics of this industry. Then, we will compare the restructuring process of this sector in the 1980s and 90s in the three major markets, the United States, Western Europe and Japan. Next, we will look at some of the some case studies in Asia, Mexico and Saudi Arabia. Finally, we will take a look at some trends in the industry that foreshadow some need for further structural adjustment.

116. According to the American Chemistry Council homepage, "a study by Industry Canada showed that nearly 40% of all employees in the US business of chemistry have at a minimum, a university degree. This is nearly double the average in US manufacturing."

117. Oil and/or natural gas (hydrocarbons) are put in a furnace, placed under heat and pressure to "crack" long chains of hydrocarbons to smaller molecules of hydrocarbons (e.g. ethylene, propylene, benzene etc). These molecules are then used to create plastics (polyethylene, polystyrene, etc), synthetic fibres, synthetic rubber, and other substances.

Characteristics of the industry

232. First, the petrochemical industry is highly capital intensive.[118] This has several implications. The relatively low share of labour cost means that relatively high unit labour costs in developed countries do not present huge disadvantages. On the other hand, the large capital requirements may pose as an entry barrier for developing countries and/or smaller companies, especially in high risk countries.

233. Second, the basic technology is mature, and there has been little major progress in recent years. Most of the technology is embedded in the plant and equipment and held by many chemical companies and engineering companies. The wide availability of technology facilitates the entry of new producers if the capital requirements can be met.[119]

234. Third, there are substantial economies of scale,[120] with larger plants having significant cost advantages. However, whether the economies of scale are realized depends on a number of factors such as whether the plant can be opened according to schedule, whether the plant can be run according to schedule without stoppages and/or accidents, availability of feedstock, sufficient demand, etc. So a smaller plant running at full capacity could be more cost efficient than a larger facility running at low capacity. Plants that have been fully depreciated may also maintain competitiveness in the short to medium term.

235. Fourth, the petrochemical industry is highly interdependent. There is a lot of intra-industry consumption (chemicals often are used as inputs to higher value added chemicals), and multiple products are often produced by a single process (naphtha cracking produces ethylene, propylene and a host of other products). This means competitiveness in petrochemicals is essential for the profitability of other products.

236. Fifth, there is a certain degree of substitutability, first among different types of raw materials for producing the same molecule (ethylene can be produced from ethane, natural gas, naphtha, etc), and secondly among different finished products for the same end-use applications (drainage pipes can be made from polyethylene or polyvinyl chloride(PVC), as well as other plastics).

237. Sixth, the petrochemical industry is energy intensive, both in terms of feedstock (ethane, natural gas, naphtha), and conversion costs (cost of heating the feedstock to make a chemical reaction). This means that countries with low cost energy such as oil and gas producing countries in the Middle East have a significant advantage, especially where technology and customer proximity is less of an issue.

238. Lastly, there is a very close relationship with the oil/gas industry. The petrochemical industry receives its inputs from the oil refining industry (e.g. naphtha) or from the oil/gas industry (e.g. ethane in off-gases emitted in the extraction of oil and natural gas). Furthermore, because some chemicals can be used for improving the quality of petroleum, the petrochemical industry sometimes supplies these to the petroleum industry. Technology used for petroleum refining and ethylene cracking are also very similar.[121] Because of these synergies, many petroleum companies have diversified into petrochemicals.

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118. A state-of-the-art ethylene unit can cost over several hundred million USD. Several plants are often built together as a petrochemical complex, which cost over 1 billion USD in total.

119. Many developing country companies have built plants as joint ventures because delays in the start-up of production may be extremely costly considering the large capital requirements and high interest rates.

120. A cost of a plant with twice the capacity costs 1.6 times as much. This is because production capacity is the function of volume while cost is a function of the metal used (surface area).

121. Petroleum refining is a process where (1) crude oil is "crack"ed into smaller hydrocarbon chains in a heated furnace, and (2) separated into various substances (gasoline, naphtha, gasoil, etc) using the different boiling points. The petrochemicals process as outlined in footnote 117 uses exactly the same principles.

Restructuring of the petrochemical sector in the 1980s

239. The petrochemical industry was born in the United States in the 1930s and 40s and grew rapidly, displacing existing materials and creating new products and end-uses. It spread quickly to European countries at the end of the Second World War, and to Japan later in the 1950s. Producers in Europe and Japan used naphtha, while US producers mainly used natural gas condensates due to resource availability (Table 10).[122] Low natural gas prices provided a big cost advantage to U.S. producers, especially as oil and naphtha prices went up. The petrochemicals industries developed behind high tariffs in the 20 to 30 percent range until the conclusion of the Kennedy Round in the late 1960s (OECD 1989).

Table 10. Ethylene feedstock of major countries

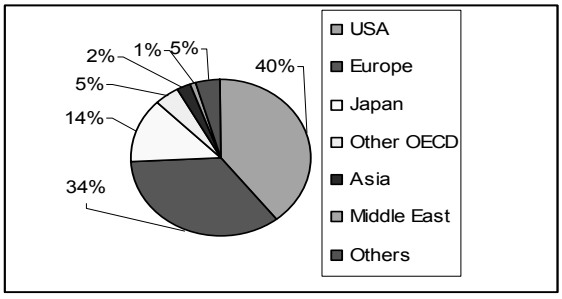
Country	Share of ethane in feedstock
U.S.	42%
Western Europe	8%
Japan	0%
Rep of Korea	0%
Saudi Arabia	76%
Canada	72%
Brazil	3%
Mexico	100%

Note: The above figures are illustrative as they are taken from different sources at different times

Source: Worell 2000, Table 8, edited by OECD.

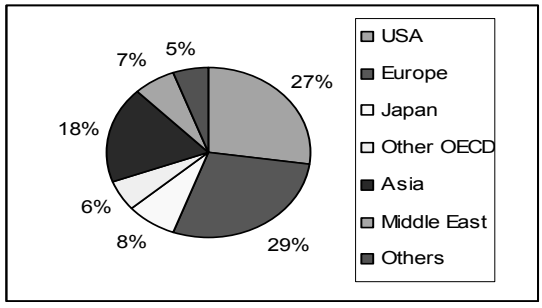
240. Until the first oil shock in 1973, OECD Member countries maintained a virtual monopoly on world chemical production by virtue of their ownership of market and technology. However, rising oil prices, maturity of technology, dissemination of technology to engineering companies, saturation of major end-use markets, slowdown in economic growth in OECD countries, led to gradual diffusion of the petrochemical industry to developing countries, especially in the Middle East (Figure 46 and 47).

Figure 46. Global ethylene production capacity (1980)



Source : OECD(1985)

Figure 47. Global ethylene production capacity (2000)



Source : Japan Petrochemical Association

241. The new entrants in Canada and Middle Eastern countries had great advantages as they could utilize state-of-the-art large scale plants and cheap inputs such as off gases from petroleum drilling. They

122. Differences in raw materials translate into different product mixes. Although all chemical building blocks are produced from naphtha, mainly ethylene is produced from ethane and natural gas condensates.

succeeded in building up their petrochemical industries. However, they did not immediately dominate the market as anticipated,[123] because of several factors.

242. First, although petrochemical producers in resource countries enjoyed significant cost advantages in ethylene and its derivatives, for technological reasons, the amount of other petrochemical building blocks[124] produced were more limited. The technology accumulated in many companies in the OECD countries enabled these companies to maintain competitiveness using these other petrochemicals in an efficient manner (In the U.S., low cost natural gas feedstock and petrochemicals derived from the large petroleum refining sector were the main sources of competitiveness).

243. Secondly, new producers often lacked access to consumers. Considering the risks involved in investment, it is necessary to have good marketing plans, which was not the case. Thirdly, there were some advantages in being near the customer. Customers sometimes had special specifications, which required closer coordination with the customer. Fourthly, the high capital requirements deterred chemical companies from shifting too much of their resources in high risk countries. For the petroleum industry, making risky investments in petrochemicals were less of a priority when the oil industry was undergoing major changes itself.

244. Although the two oil shocks and some new entrants from Canada and the Middle East did not lead to a radical shift in the global petrochemical industry as once anticipated, the profitability of the petrochemical sector began to suffer with the diffusion of technology and increase in the number of players. A wave of investment in the late 1970s and an economic downturn led to considerable excess capacity and a need for considerable structural adjustment in the "Big Three" in the 1980s (see Table 11).

Table 11. Global ethylene and production in the 1970s and early 80s

(million tons)

			Ethylene Capacity						Capacity addition		
			1974	1979	1980	1981	1982	1983	1974-1979	1979-1981	1974-1981
Western Europe	Theoretical Capacity	a)	12.7	15.6	15.8	17.6	16.5	14.4	+2.9	+2.0	+4.9
	Production	b)	10.4	12.3	10.9	10.3	10.1	-	+1.9	-2.0	-0.1
	Unused Capacity	c)	2.3	3.3	4.9	7.3	6.4	-	+1.0	+4.0	+5.0
	% of a)	d)	18%	21%	39%	41%	39%				
Japan	Theoretical Capacity	a)	5.1	6.1	6.1	6.1	6.2	6.2	+1.0	0.0	+1.0
	Production	b)	4.2	4.8	4.2	3.7	3.6	3.7	+0.6	-1.1	-0.5
	Unused Capacity	c)	0.9	1.3	1.9	2.4	2.6	2.5	+0.4	+1.1	+1.5
	% of a)	d)	18%	22%	31%	40%	42%	40%			
USA	Theoretical Capacity	a)	11.2	14.8	16.8	18.0	17.8	17.0	+3.6	+3.3	+6.9
	Production	b)	10.8	13.6	13	13.3	11.2	-	+2.8	-0.3	+2.5
	Unused Capacity	c)	0.4	1.2	3.8	4.7	6.6	-	+0.8	+3.6	+4.4
	% of a)	d)	4%	8%	23%	26%	37%				

Source: OECD, 1985.

245. Although the excess capacity problem was common to all three major markets, the structural adjustment process (including reduction in capacity and in the number of players) proceeded in a somewhat different manner. In the United States, the reductions were market driven and without explicit

123. As we shall see later, producers in these countries are capturing an increasing share of the world market.

124. Other petrochemical building blocks include propylene, butylenes, butadiene, benzene, toluene and xylene. These other building blocks are often used for value added products such as engineering plastics and pharmaceuticals.

coordination. In Europe, both market forces and government intervention played a role. Government played a large role, especially in Italy and France, where the state had large ownership stakes (Martinelli 1991). In Japan, the Japanese government played a major role by coordinating capacity rationalisations. Here, we will briefly see how the process differed in the three major markets after a quick look at the market situation in each market.

(1) U.S.

246. The U.S. petrochemical industry at the beginning of the 1970s consisted of a wide variety of players; the large chemical conglomerates such as Dow and DuPont, the big oil companies and gas companies who had diversified downstream, and some others such as Goodyear, Georgia Pacific who were non-chemical companies that had diversified.

247. Lower growth prospects, low profit rates, and intensifying international competition brought about by substantial worldwide excess capacity led to a restructuring which was quicker and more thorough than in Europe and Japan (Lane 1993; Lieberman 1990; Da Rin 1998). On the one hand, many large chemical conglomerates pushed forward with 1) divestment or significant downsizing of traditional businesses in commodity chemicals, and 2) diversification into specialty chemicals and other higher value added downstream operations allowing greater product differentiation and competitive positioning.[125] This led to a significant consolidation of the commodity chemicals business in the United States, accompanied by major changes in ownership patterns.[126] Major oil companies, with some exceptions, expanded and strengthened their positions in commodity chemicals (Bozdogan 1989).[127]

248. One of the reasons that restructuring proceeded quickly in the U.S. was the stronger monitoring by the capital markets (Lane 1993). Institutional investors put pressure on both chemical and petroleum companies to sell their petrochemical portfolio because they viewed petrochemicals as a declining sector, which was dragging down returns on equity. Detaching the petrochemical portfolio was thus often preferable for the evaluation of the stock of a company whether in petroleum or in other chemical areas.

249. The frequent use of leveraged buyouts is an example of how the capital market facilitated structural adjustment. For example, Huntsman chemical, a company founded in 1982 has become the world's 15th largest chemical company by buying commodity chemical plants put up for sale by major chemical corporations using leveraged buyouts.[128] Sterling Chemicals, Cain Chemicals, Vista Chemical, Georgia Gulf, Aristech are similar examples of leveraged buyouts which facilitated industry restructuring.

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125. Dow, Union Carbide, DuPont, and Monsanto put more emphasis on specialty chemicals by either selling plants or decreasing production capacity in commodity chemicals. Commodity chemicals accounted for a much smaller share of total sales of major US companies after these restructuring activities. At Dow Chemical, the proportion dropped from 63% to 50 percent between 1981 and 86, and at Monsanto it fell from 61 percent to 35 percent (Bozdogan 1989).

126. Of the 1978 total capacity in ethylene, 41.9% was sold. In high density polyethylene, 90.5%, low density polyethylene, 52.1%, polypropylene, 78.5%, and polystyrene, 49.4% were sold respectively (Lane 1993).

127 . Some petroleum companies decided to pull out or decrease their petrochemical interests (Arco, Gulf, Shell, etc.), and some diversified companies exited petrochemicals.

128. Huntsman chemical started off with acquiring Shell's polystyrene business in 1983, and has grown through the acquisition of other commodity chemical divestments by Hoechst, Shell, Goodyear, Texaco Chemicals, Monsanto, and ICI.

250. Another reason that restructuring in the United States proceeded more smoothly was that capacity was more concentrated in leading manufacturers compared to other markets.[129] Concentration facilitates structural adjustment as "multi-plant firms may be more willing to close a plant than single plant producers (Lieberman 1989)". U.S. capacity reductions through plant shutdowns started as early as the 1980s, mainly through unilateral reduction of capacity by the largest producers, and some exit by the more inefficient smaller players.[130] By the end of 1982, 0.8 million tons had been permanently shut down, and another 1.3 million tons had been mothballed for possible restarting later (Spitz 2003). The restructuring consolidated production of commodity chemicals into fewer, more specialized firms (Lane 1993).

251. Yet another reason for the smooth restructuring was that most of the capacity were ethane based and were geographically concentrated in Texas and Louisiana, with a substantial interconnecting pipeline grid and extensive opportunities for barge shipments. This made shutting down individual plants much easier as plants were less interdependent, and closing of independent plants did not affect the other plants.

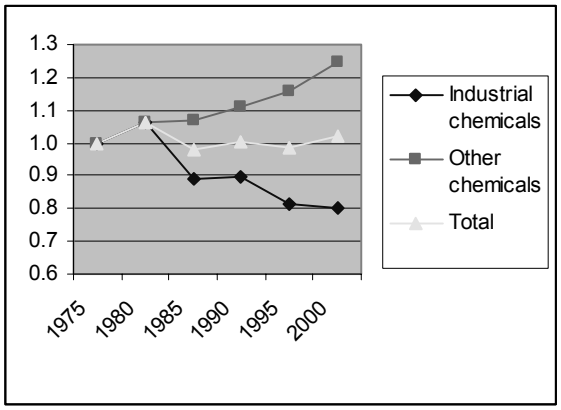
252. Foreign capital played a very important role in the restructuring. The large European multinationals such as BASF, Hoechst, ICI, etc. bought up both entire companies and individual businesses being divested, either to expand their sales in North America, or to increase their specialty portfolios. Asian companies such as Shintech (Japan), Formosa plastics (Taiwan), and Westlake Chemicals (Taiwan) also emerged as important new players in this period.

253. The restructuring of the U.S. chemical industry was very successful as profitability bounced back. In the late 1980s, return on equity was about 5 points higher for major chemical companies compared to the average in large manufacturing (Bozdogan 1989). In terms of employment, between 1980 and 1990, employment in industrial chemicals decreased from 477,000 in 1980 to 376,000 in 1986, but it recovered to 402,000 in 1990. When looking at the chemical sector (industrial chemical + other chemicals) as a whole, one sees only a decrease of 5.7% from 941,000 to 887,000 as there was growth in "the other chemicals" sector, which includes pharmaceuticals (Figure 48 and Table 12).

129 According to Chapman (1990), in 1973, although there were 25 producers producing ethylene, 40.5% of production was concentrated in the top 3 producers (as opposed to 24.3% in Western Europe).

130 For example, in 1982, Exxon cut down its U.S. ethylene capacity by 450,000 tons (Bozdogan 1989).

Figure 48. Employment in the United States



Source : UNIDO

Table 12. Employment in the U.S. chemical industry

(Unit: 000s)

	1980	1981	1982	1983	1984	1985	1986	1987	1988	1989	1990
Industrial chemicals	477	464	443	422	413	401	376	382	386	394	402
Other chemicals	464	459	464	465	467	466	469	467	478	490	485
Total	941	923	907	887	880	867	645	649	964	884	887

Source: UNIDO

(2) Europe

254. European chemical companies faced similar problems to their counterparts in the United States but reorganization of the chemical industry was slower than in the United States for several reasons.

255. First, the problem was more complicated because the European market was more diverse. "There were a number of petrochemical industries that operated according to the rules of private capitalism while there were others, that were state-controlled" (Aftalion 1991). Norway, Sweden, Finland and Portugal, all with populations far too small to support petrochemical projects, decided to build large installations in the 1960s and mid-1970s (Spitz 2003). Meanwhile, state owned companies in France, Italy, and Netherlands continued to expand capacity. There were also cases like Italy where private companies received large amounts of state aid for regional policy reasons (See Box 14). Prolonged government subsidies in the face of considerable losses, and state intervention to corporate decisions on restructuring plans, lead to delays in adjustment.

Box 14. An example of State Intervention in the European Chemical Industry

At the beginning of the 1960s, Italy embarked upon a program to attenuate the socio-economic cleavage between the north and south of Italy commonly called Mezzogiorno. Between 1950 and 1973, the Brindisi province received funds for 170.6 billion Lire, 93 per cent of which benefited the chemical sector. A petrochemical complex was built close to Brindisi by Montecatini, a chemical and mining conglomerate which had had a fertiliser plant in the area since 1929. As a result, industrial employment in Brindisi became dominated by the chemical sector with almost 4,500 workers employed in the sector in 1971 representing more than 24 per cent of the total manufacturing work force.

Although a private company, the corporate culture of Montedison (Montecatini had merged with Edison in 1968) was affected by the role it had been given by the Italian State. The public money received to locate in the south fed a culture of unaccountability and of political interference which undermined efficiency. One major effect of this was the over-manning of the petrochemical plant which was in the interest of both management and trade unions. The fact that the system of financial incentives to plants in the south was linked to personnel numbers accentuated this tendency. Although market trends often dictated plant closures or the restructuring of some production lines, measures to reduce workforce were often not implemented due to the commitment to safeguarding existing employment. Montedison had been able to show balanced books only once in ten years, in 1979.

For example, an accident in the Brindisi petrochemical plant in 1977 led to reduced production and large rise in unit costs. In these circumstances, Montedison decided to close its activity in Brindisi. However, in 1978, as a result of state intervention, the company modified its decision. They agreed on a restructuring plan which allowed Montedison to rebuild the ethylene plant and reorganise its production using public money. Montedison however

continued to have financial difficulties. As a result, ENI the state owned petroleum company was called upon to rescue the company, which led to the formation of Enichem.

With the end of large-scale state industrial intervention in the south in 1992, Enichem began to take substantial steps to regain efficiency for example by pursuing joint ventures with foreign companies and divesting certain businesses. The downward profitability trend of the 1980s has shown signs of improvement after 1993.

Source: Greco (2002), Greco (2004) and Aftalion (1991).

256. Second, production in Europe was much less concentrated in the leading manufacturers compared to the United States (24.2% of ethylene produced by the top three manufacturers as opposed to 40.5% in the United States (Chapman 1990)). Third, compared to the United States, accountability of firms to shareholders was weaker in Europe than in the United States. This was of course the case in state owned companies and where subsidies were involved, but even where state owned companies were not involved there were differences in how the financial markets worked (e.g. between U.S. and Germany).

257. Although slower than in the United States, similar restructuring took place in Western Europe. In Germany and Great Britain, where there was no state ownership and capacity was more concentrated, 33 percent and 24 percent of ethylene capacity were shut down during 1981 and 82 (Spitz 2004). In some cases, reductions took the form of unilateral decisions. For example, BASF reduced its LDPE capacity by one third between 1980 and 1983 and shut down two ethylene crackers. Shell and Hoechst made similar reductions. In other cases, restructuring involved inter-firm agreements. The most important of these was a decision by ICI and BP Chemicals to exchange their respective polyethylene and vinyl chain portfolios in 1982.

258. In some other countries, restructuring proceeded differently. In France, the state took control of 70 percent of the petrochemical industry, and companies were cut up along lines decided by the government. In Italy, where state regional subsidies had led to construction of small and poorly integrated petrochemical centers, the whole Italian petrochemical sector was restructured around the state owned petroleum company ENI and Montedison. As a result, between 1980 and 1984, twenty five ethylene and eight polyethylene units were scrapped in Western Europe (Aftalion 1991, Spitz 2003).

259. There are two things worth noting, the role of industrial associations and foreign direct investment. Industrial associations, such as the Association of Petrochemical Producers in Europe (APPE) formed in 1985, played a limited yet useful role in the process. Joint decisions for capacity shutdowns could not be made as it would be subject to possible antitrust problems. However, APPE facilitated the restructuring process by providing benchmarking data on capacity and production trends.

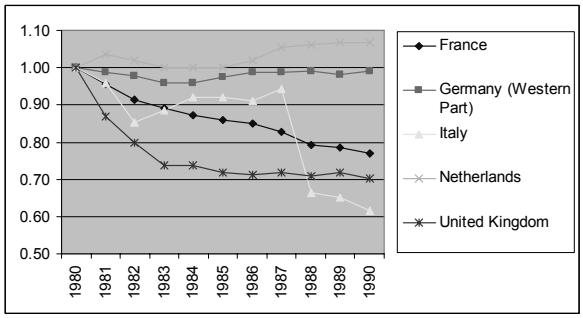
260. Foreign direct investment also played a role. In the initial stages of restructuring, major US oil and chemical firms withdrew from commodity chemical production in Europe, facilitating capacity reduction and/or concentration of capacity. In the later phase, the creation of "Common market" and concern over "Fortress Europe" led US and Japanese chemical companies to make investments in Europe, facilitating the transition of the European chemical industry to areas of higher added value contributing to new employment. One other interesting feature is the emergence of Middle Eastern countries as suppliers of capital. Qatar's association with CdF Chimie in France, and Kuwait's involvement in Hoechst (Germany), ERT and Cros (Spain), and further down the road, Saudi Arabia in DSM (Netherlands) and Abu Dhabi in Borealis (Denmark) are examples where the interests of Middle Eastern countries to gain technology and a market foothold in Europe have coincided with interests in Europe.

261. The effects on restructuring on employment in industrial chemicals between 1980 and 1990 have been mixed depending on the country (Figure 49-51). In the Netherlands and Germany, there was even an

increase in employment. In France, job loss in industrial chemicals was compensated by job increases in other chemicals. Italy saw an increase in jobs in the industrial chemicals sector between 1982 and 1987, but experienced an even severe job loss between 1987 and 1990. The United Kingdom experienced considerable job loss between 1980 and 1983 but the decrease levelled out, and job increases in other chemicals after 1985 allowed total employment after 1985 to increase.

Figure 49. Employment in Europe (industrial chemicals)

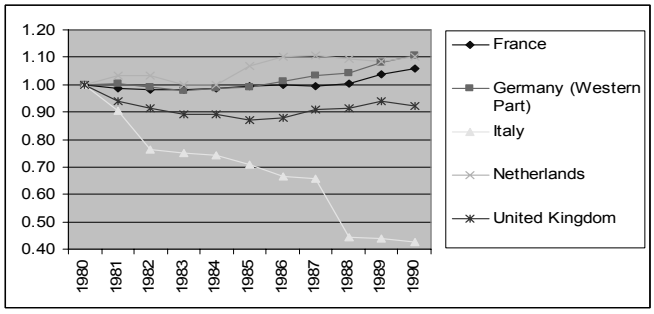
Industrial chemicals (ISIC 351)



Source : UNIDO

Figure 50. Employment in Europe (other chemicals)

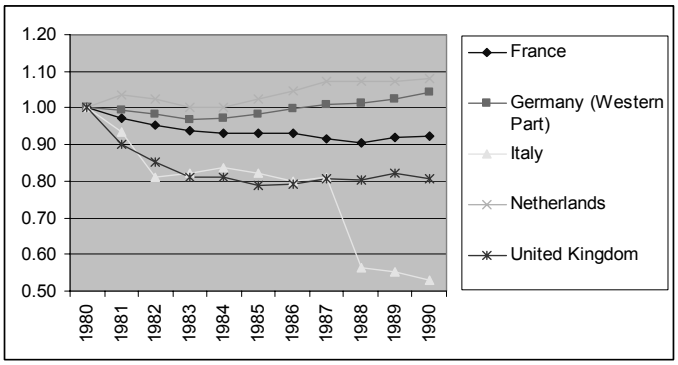
Other chemicals (ISIC 352)



Source : UNIDO

Figure 51. Employment in Europe (total chemicals)

Total (ISIC 351 + 352)



Source : UNIDO

(3) Japan

262. Japan's petrochemical industry which started in the 1950s grew rapidly from 78 thousand tons in 1960 to 3 million tons in 1970. Numerous players including affiliates of major groups,[131] subsidiaries of petroleum companies,[132] entered this high growth sector, which led to the creation of a highly fragmented market. Investment was subject to stringent foreign exchange controls, and permits were required to import technology and equipment. Foreign exchange controls were eventually relaxed allowing free entry.

131 Major corporate groups such as Mitsubishi, Mitsui, Sumitomo all entered the petrochemical industry.

132 Idemitsu, Maruzen, Tonen (Exxon Mobil) and Nippon Oil Corp are examples of petroleum companies with petrochemical subsidiaries.

263. When in the early 1980s, the depression of the petrochemical industry worsened and industry itself seemed incapable of finding a solution to its excess capacity problem, the Ministry of International Trade and Industry (MITI) instructed the Industry Structure Council to come up with concrete plans to reduce domestic capacity for some basic petrochemicals. A structural improvement basic plan was formed which cut ethylene capacity by 36% and placed additional capacity investment on hold. Most of the smaller less competitive plants made in the 50s and 60s were shut down or mothballed. Over 80% of the targeted reduction was achieved, and the average size of ethylene plants improved from less than 200,000 tons/annum to 330,000 tons/annum. Similar targets were made and achieved for other products such as polyolefins and vinyl chloride. In some areas, depression cartels were formed, and in polyolefins, joined marketing companies were set up whereby 17 producers were grouped into 4 to cut costs as a group.

264. The government intervention succeeded in reducing capacity, and all major companies survived. When market conditions improved in the latter 1980s, companies restarted mothballed plants, made new investments, and moved back to the growth trajectory again. However, government intervention had some serious setbacks: 1) consolidation of the industry was delayed compared to the US and Europe, as it did not lead to exit of inefficient players. For example, the number of manufacturers in polyethylene only decreased from 16 in 1983 to 14 in 1994, and in the case of polypropylene actually increased from 12 to 14. This was because due to equity problems, the capacity reductions were calculated more or less on a pro rata basis. 2) Subsequent over-capacity problems may have been amplified. Because capacity reductions were calculated based on existing capacity, companies had an incentive to maintain old capacity while accelerating investments in new capacity. 3) It may have led to future moral hazard problems. While MITI had turned a marked shift away from individual industrial policy, corporate decisions for restructuring may have been delayed because of continued expectations towards governmental intervention, when markets faced a downturn.

Restructuring from the late1980s to present

(1) United States and Western Europe

265. The chemical industry in the United States and Western Europe continued along the path of consolidation[133] throughout the 90s to the present. One new factor contributing to structural adjustment in Western Europe was the creation of the Single European Market (SMP: 1986-95). Through the general removal of physical barriers and obstacles to movement of labour and capital, streamlining of regulations on dangerous substances, regulations on classification, packaging and labelling of dangerous preparations etc,[134] the Single European Market, or anticipation thereof, had a major impact on corporate strategy through the intensification of competition (EC 1997, CEFIC interview). According to survey evidence, "the SMP facilitated cross-border M&As and joint ventures with one third of the companies considering the single market as the main reason for seeking joint ventures with companies in other EC countries"(EC 1997). The M&As and joint ventures allowed companies to take advantage of economies of scale more

133 Examples include, mega-mergers in the petroleum industry between 1998 and 2003 (Exxon/ Mobil, BP/Amoco, TotalFinaElf and Phillips/Chevron) which led to consolidation of downstream operations, and other mega-mergers such as the formation of Equistar (Lyondell/Occidental/Millenium), Basell (Shell/ BASF), and the take over of Union Carbide by Dow Chemicals.

134 Elimination of tariff and quantitative restrictions on internal trade (eliminated in 1968 for the six initial members and subsequently expanded in 1973 to include Denmark, Ireland and the United Kingdom) seemed to have had relatively limited effects.

effectively, and together with increased competition, productivity improved substantially. A move to unified competition policy in the EU[135] facilitated cross border mergers, which became the norm.[136]

266. EC regulation related to state subsidies were also an important aspect of competition policy. Under EC rules, any form of aid by a Member State or through state resources which distorts or threatens to distort competition were incompatible with the common market in so far as it affects trade between Member States. This clause, together with the general trend of increased competition in Europe, contributed to some decrease of state intervention.[137] However, it should be noted that the report also states that state aid continued to be a problem.

267. Private equity firms also began to play a major role in Europe. For example, British-based Ineos formed in 1998 through a venture-capital-supported management buyout of a part of BP Chemicals, has quickly become a major chemical producer (No. 32 on Global Top 50) through a series of opportune acquisitions. In 2005, BP further sold its polyolefin subsidiary to Ineos, and Basell (the polyolefin subsidiary of BASF and Shell) was bought up by Nell Acquisition, another private equity firm.

268. This consolidation has led to greater concentration of capacity both globally and regionally. For example, the Dow/Union Carbide and Exxon/Mobil mergers resulted in 41 percent of the North American polyethylene market being shared between them.[138] In polypropylene, in 1990 there were 17 European producers, and the top 5 held 50% of capacity. By the year 2002, there were only 9 producers, and the top 5 held 80% of capacity (CEFIC 2004). Increase in the weight of intra-EU exports suggests an increase of competition within the EU (Table 13).

135 The adoption of the merger regulation in 1989 (Council Regulation 4064/89) established a system of prior clearance by the European Commission of all mergers and acquisitions having a "Community dimension", requiring no parallel filing to Member State competition authorities.

136 . Merger of Akzo (Netherlands) and Nobel (Sweden) to form Akzo Nobel, Stat Oil (Norway) and Neste Chemicals (Finland) to form Borealis in 1994, Rhone Poulenc (France) and Hoechst (Germany) to form Aventis in 1999, are but a few examples.

137 . Bertero (2002) argues that the European Commission was successful in imposing some financial discipline on both the Italian government and the state held corporate sector. For example, in 1994, the European Commission (EC) investigated the state aids provided to Enichem in 1992 and 1993 and did not approve the package (EC(1994)). In 2005, the EC ordered the recovery of a part of the grant aid provided to Chemische Werke Pieteritz (CWP), an eastern German producer of chemicals as not meeting the Community Guidelines for rescuing and restructuring firms in difficulty (EC(2005)).

138 Without intervention of the competition authorities, the Dow/UC merger would have given the combined entity control over 44% of European linear low density polyethylene.

Table 13. EU trade in chemicals (excluding pharmaceuticals)

(billion Euros)

	1994	1995	1996	1997	1998	1999	2000	2001	2002	2003	2004
Extra EU exports	58	62	66	80	73	79	100	99	101	104	102
	21%	22%	24%	27%	23%	25%	27%	26%	26%	27%	25%
Intra EU exports	99	116	120	129	145	148	173	175	176	176	198
	37%	40%	43%	44%	46%	46%	46%	47%	46%	46%	49%
Domestic sales	113	110	90	87	95	94	101	102	106	105	101
	42%	38%	33%	29%	30%	29%	27%	27%	28%	27%	25%
Total	270	288	276	296	313	321	374	376	383	385	401

Source: CEFIC, edited by OECD.

269. According to ICEM, chemical industry employment dropped steadily in the EU, from 1,943,000 in 1990 down to 1,664,000 at the beginning of 2000 by 14 percent, while production climbed by 31 percent in real terms. Decline of chemical industry employment in the US in this period has been more gradual and less severe than in the EU, from 1,050,000 in 1995 to an expected 1,025,000 by the end of 2001 (ICEM 2001).

(2) Japan

270. After a period of growth in the late 1980s, the Japanese petrochemical industry faced a recession in the 1990s as the "bubble" burst. Domestic demand of ethylene reached a peak of 5.9 million tons in 1997 (Table 14). While restructuring in both the United States and Western Europe have led to cross border mergers creating global champions, restructuring of the Japanese industry was limited. Even companies in the same group (Mitsubishi Kasei and Mitsubishi petrochemicals, Mitsui Toatsu and Mitsui petrochemicals) did not merge until the mid 1990s.[139]

139. Even as restructuring in the financial sector has led to the disassembly of old groups (i.e. Mitsui-Sumitomo bank merger), the much hailed merger between Mitsui and Sumitomo chemicals was cancelled.

Table 14. Japan's petrochemical production and trade

000t (ethylene equivalent)

	Export	Import	Balance	Consumption	Export/ (%) Production	Import/ (%) Consumption
1990	737	642	95	5742	12.7	11.2
1991	882	664	218	5802	14.4	11.2
1992	1061	481	580	5601	17.4	8.7
1993	894	485	409	5427	15.5	9.0
1994	1175	553	622	5483	19.2	10.0
1995	1662	454	1208	5658	23.9	7.9
1996	1739	459	1280	5815	24.4	7.8
1997	1811	432	1379	5964	24.4	7.2
1998	1957	407	1550	5565	27.7	7.4
1999	2364	478	1886	5788	30.8	8.2
2000	2138	411	1727	5898	28.1	7.0
2001	2051	417	1634	5623	27.9	7.3
2002	2157	393	1764	5473	30.2	7.3
2003	2238	420	1818	5560	30.4	7.6
2004	2206	388	1818	5752	29.1	6.7

Source: JPCA.

271. The lack of progress in industry consolidation was due to a combination of factors including, *interalia*, 1) weaker monitoring by the capital market;[140] 2) profitable specialty chemical divisions (such as electro-chemicals, pharmaceuticals) allowing companies to present profits as a whole; 3) highly fragmented industry and dispersed location of chemical plants; 4) substantial increase of petrochemical exports to China which kept overcapacity from becoming a problem;[141] and 5) tariff barriers as high as 20% for some products.

272. However, as a result of the Uruguay Round and the Chemical Tariff Harmonization Agreement (CTHA: see Box 15), tariffs were progressively reduced from 1995. One interesting feature of Japan's commitments under the CTHA was that there was a perceived inflection point in the reduction schedule in the year 2004. This was because Japan's tariff reduction commitments had been made on a specific duties basis (yen/kg) with a final year (2004) commitment on an ad valorem basis (Table 15). The depressed international prices of many petrochemical products meant that the specific duties provided higher ad valorem tariff protection while global prices were depressed.

140 Banks and shareholders have traditionally not interfered in management decisions as long as there are sustained profits.

141 This has resulted in an increasing dependency on exports especially China.

Table 15. Japan's tariff reduction schedule under CTHA

(Specific duties in yen/kg)

	1995	1996	1997	1998	1999	2000	2001	2002	2003	2004
LDPE	20.99	19.58	18.17	16.76	15.35	13.94	12.53	11.12	9.71	6.5%
					18.9% (1)				6.0%-11.4%(2)	
HDPE	20.99	19.58	18.17	16.76	15.35	13.94	12.53	11.12	9.71	6.5%
					20.4%(1)				7.3%-10.1%(2)	
PP	24.06	22.52	20.98	19.44	17.9	16.36	14.82	13.28	9.71	6.5%
					27.3%(1)				6.8%-10.6%(2)	
PS	10.7%	10.3%	9.8%	9.3%	8.9%	8.4%	7.9%	7.4%	7.0%	6.5%

Note 1: ad valorem equivalent converted using CIF Japan prices (Hyakushima 2005)

Note 2: ad valorem equvalent converted using CIF data by OECD

Source: Japan Petrochemical Association.

273. The "Year 2004 problem" together with the bigger structural changes in the industry triggered some consolidation in downstream polymers. In the area of polyethylene, the number of players decreased from 14 in 1994 to 8 in 2005. Similarly, polypropylene producers decreased from 14 to 4, polystyrene from 9 to 4, and polyvinylchloride from 15 to 7. Although there have been some divestment/acquisitions, joint production and marketing agreements have been more prevalent. Such agreements, while not as effective as company mergers in increasing efficiency, have been considered as a second best option for petrochemical companies unwilling to divest businesses directly affecting viability of their ethylene crackers.

274. In the meanwhile, the number of workers in petrochemicals has decreased from 104,812 in 1990 to 80,142 in 2002 by 24%. These reductions have mostly been realized through early retirement, decrease in new hiring, and through personnel transfers to other units in the same company or to subsidiaries.

Box 15. Chemical Tariff Harmonization Agreement

As a part of the Uruguay Round, a group of WTO Members agreed to harmonize tariffs on a broad range of chemical goods to promote liberalization in the chemical sector and to develop a more predictable and transparent global tariff structure. The result was the Chemical Tariff Harmonization Agreement (CTHA), which led to a substantial reduction and harmonization of chemical tariffs (Harmonized System Chapters 28-39) in the signatory countries. Participants in the Agreement agreed to harmonize tariffs at three levels: zero, 5.5 percent, and 6.5 percent. The tariff cuts by CTHA signatories were provided on an MFN basis, irrespective of whether the exporting country has participated or not. As a result, MFN tariff rate for chemicals have been reduced considerably. As of August 2004, the number of participants have expanded to 26 counting the EC (25 members) as 1), with the addition of new participants such as PRC and Taiwan.

On 4 July 2005, Canada, Japan, Norway, Separate Customs Territory of Taiwan, Penghu, Kinmen, and Matsu, Singapore, Switzerland, and the United States submitted a proposal on tariff liberalization in the chemical sector which follows up on the CTHA in the Uruguay Round (TN/MA/W/58). The proposal calls for wider participation while providing special and differential treatment to developing countries in the form of longer implementation periods, zero for "x", and partial participation.

Structural Adjustment in other countries and areas

275. Compared to the experience in the United States, Western Europe and Japan, the experience of structural adjustment in other countries and areas has been that of "catching up". The petrochemical sector, which is closely associated to the petroleum sector, was often developed with substantial government involvement. In many cases, the petroleum sector has vertically integrated into the

petrochemical sector,[142] while in the case of Saudi Arabia, a separate organization, SABIC was established. There have been cases like Singapore, where government provided equity and considerable infrastructure, and others like Korea, where the government provided support mainly through soft loans.

276. As highlighted in the introductory section, the petrochemical industry in other countries and areas has experienced rapid development. However, there are considerable differences in how countries have adjusted to changing conditions in the global market. One trend is for countries to increasingly rely on FDI to realize growth efficiently. Although many countries placed emphasis on developing the most upstream activities on their own in the past, many countries are now developing the sector through joint ventures with major oil/chemical companies.[143] Here, we compare the experience of several developing countries.

Eastern Asia excluding Japan and China

277. The petrochemical industry in the East Asian region started off with Korea and Taiwan in the 1970s, and spread to the ASEAN region in the late 80s and 90s (Table 16). In Korea, chaebols were the engine of industry growth. Although industry growth was modest due to government regulations until 1986, when the Petrochemical Development Act which regulated investment was repealed, chaebols competed to add capacity,[144] and ethylene output more than tripled between 1990 and 1994. As a result, Korea became extremely dependent on exports. In Chinese Taipei, the development of the industry was mainly led by domestic private companies such as Formosa Plastics (FPC) and Chimei. After the lifting of investment restrictions on petroleum refining, olefins production and electricity generation, FPC accelerated its growth, and has become Taiwan's top petrochemical company, with significant production in the United States, and ranked the 15th largest chemical company in the world in 2005.

Table 16. Ethylene production in East Asia

(000 t)

	1987	1988	1989	1990	1991	1992	1993	1994	1995	1996	1997	1998	1999	2000	2001	2002	2003
Korea	574	605	666	1065	1584	2839	3315	3656	3737	4016	4456	5139	5202	5538	5439	5656	5905
Chinese Taipei	823	852	771	779	709	734	742	889	847	906	959	935	1296	1592	2584	2395	2679
Singapore	438	447	370	400	422	390	460	450	450	460	718	926	941	1002	1332	1456	1614
Thailand	0	0	0	155	184	203	284	284	371	633	978	1104	1487	1775	1749	1847	1965
Indonesia	0	0	0	0	0	0	0	0	190	381	508	464	407	493	267	463	453
Malaysia	0	0	0	0	0	0	0	140	315	420	500	630	662	835	913	1285	1407
East Asia Total	1835	1904	1807	2399	2899	4166	4801	5419	5910	6816	8119	9198	9995	11235	12284	13102	14023
	1987=1	1.0	1.0	1.3	1.6	2.3	2.6	3.0	3.2	3.7	4.4	5.0	5.4	6.1	6.7	7.1	7.6

Source : Ministry of Economy Trade and Industry, Japan.

278. The ASEAN region was limited to isolated investments in downstream chemicals using imported inputs for the domestic market in the 1960s and 70s. However, it moved into a new stage of development as Singapore built a petrochemical complex in the mid 80s (Table 17). Singapore was followed by Thailand, Malaysia, and Indonesia who capitalized on the growing market and newly found natural hydrocarbon resources. As in other countries, governments have been involved in the initial stage either

142 Pemex in Mexico, Petrobras in Brazil, the China Petrochemical Company in Taiwan, Compania de Petroleos in Chile, Sinopec in China, Pertamina in Indonesia, the Indian Petrochemicals Corporation in India, Petronas in Malaysia and the Petroleum Authority in Thailand (PTT) are examples.

143 This is primarily because although the technology is available, the growth of minimum viable capacity has rendered the risks of failure much larger. FDI has often been used particularly in the case of downstream activities, where the technology gap is greater.

144 For example, Hyundai and Samsung both entered petrochemicals at this time. Hyundai Petrochemical after running into trouble was sold to LG Chemical and Honan Chemicals. Samsung was bailed out by Total.

through equity participation or debt financing. However, in many cases there has been a decrease in state involvement,[145] or the sector has opened up to private investment (Exxon Mobil in Singapore, TPI in Thailand). Investments in the downstream sectors were commonly conducted under foreign ownership or participation. Some have been very successful (Singapore, Malaysia), while some have proved less so (Indonesia). Exports of petrochemicals have increased exponentially as ASEAN countries have increased production (Figure 52). Exports have increased both within the region and to markets outside the region.

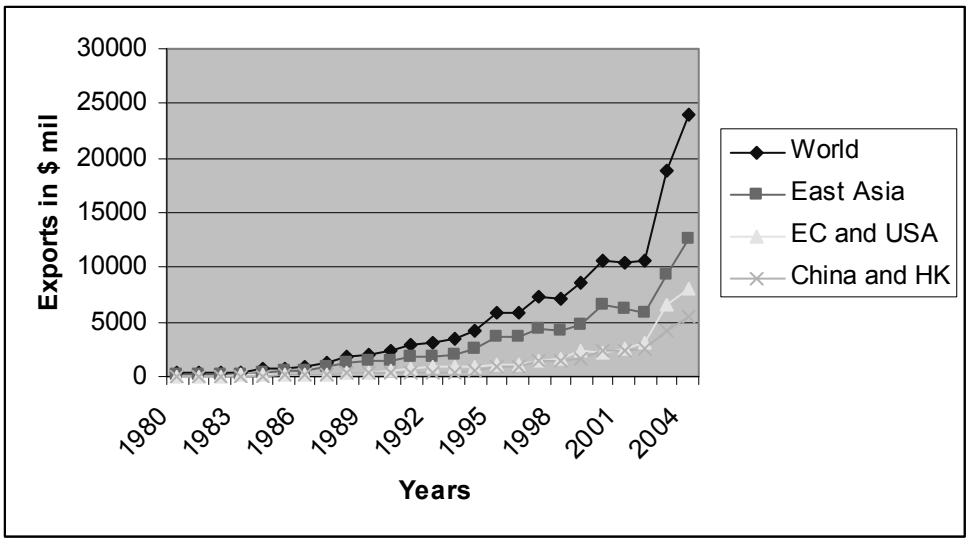
Table 17. Ethylene capacity additions in the ASEAN region

Country	Name	Year	Capacity	Description
Indonesia	Chandra Asri	1995	540 000	Initially Indonesian and Japanese JV with no involvement of Pertamina (SOE in petroleum). After ownership restructuring, now held by Indonesia, Malaysia and Singapore investors.
Malaysia	Titan	1993	660 000	JV between PNB (Malaysia Investment Public Corporation), and Chao Group (Chinese Taipei)
	Ethylene Malaysia	1995	400 000	JV between Petronas (Malaysian SOE in petroleum), British Petroleum and Idemitsu(Japan), now a Petronas / BP JV.
	Optimal Olefins	2002	600 000	JV between Petronas and Dow chemicals
Singapore	PCS (Petrochemical Corporation of Singapore)	1984	475 000	JV between the Shell and consortium of Japanese companies
	"	1997	595 000	"
	Exxon Mobil	2001	800 000	
Thailand	NPC (National Petrochemical)	1989	437 000	JV with PTT (Petroleum Authority of Thailand), CRP (the Bureau of the Crown Property of Thailand) holding majority. NPC and TOC were merged to form PTTCH in Dec 2005.
	TOC (Thai Olefins)	1994	685 000	JV with PTT (Petroleum Authority of Thailand-40%), NPC and 6 user companies. NPC and TOC were merged to form PTTCH in Dec 2005.
	TPI	1997	360 000	Thai Private Company went bankrupt and under court supervision in 2000 and plans to emerge from bankrupcy in 2006.
	ROC(Rayong Olefins)	1998	885 000	JV between PTT and a number of other companies

Source: Secretariat from various sources.

145 For example, the Singapore government sold its shares in PCS, and PTT Thailand has listed NPC and TCC (now merged as PTTCH) as public companies.

Figure 52. ASEAN exports in petrochemicals by destination



Note 1. Total of SITC Rev 2. 51 (oraganic chemicals) and 583 (polymer products)

Note 2. East Asia consists of ASEAN 5, China, Chinese Taipei, Hong Kong China, Japan, and Korea

Source: WITS data base.

279. The financial crisis which erupted in Thailand in 1997 and spread to Korea, Malaysia, and Indonesia had a profound effect on the chemical industry in the area, although companies in Singapore and Chinese Taipei went relatively unscathed. The crisis affected the petrochemical industry in two ways. First, many petrochemical conglomerates were immediately affected by the depreciation of their currencies because it boosted their foreign debt when measured in local currency, while much of the income were based on local currencies. Secondly, the financial crisis triggered a deep economic recession in 1998, which led to drops in demand. The crisis especially affected companies which had made aggressive investments using short term debt.[146] These companies were forced to restructure their debts or filed bankruptcy. In Korea, the financial crisis triggered a restructuring which have been focused on divestment of non-competitive, non-core businesses, to allow companies to focus their resources on core areas. For example, Hyundai Petrochemical was split and acquired by LG Chem and Honam Petrochemical in 2004. Buyers have often been foreign companies, as was the case in TotalFinaElf's involvement in Samsung Chemical.[147] In other East Asian countries, foreign partners often contributed to restructuring where they bought up local partner ownerships in joint ventures. However, where there were upper limits on foreign ownership as was the case in Thailand and Malaysia, restrictions needed to be relaxed. Lack of a well-functioning bankruptcy law also acted as a brake on structural adjustment in some cases.[148] Although bankruptcy laws in this area has been improved, much still needs to be done.

146 Chandra Asri in Indonesia, TPI in Thailand, and some investments by chaebols in Korea are examples.

147 Other examples include the sale of Hyosung-BASF by BASF, Tong Suh Petrochemical by Asahikasei, and Dongsung Chemical by ICI)

148 . TPI in Thailand is a case where insufficient bankruptcy laws led to a delay in restructuring. OECD (2001) explains how "a well developed insolvency system is a critical component of every well-functioning market economy" by facilitating "smooth reallocation of resources into more productive uses for firms that cannot be returned to profitability".

China

280. China's petrochemical industry since its start in the 1960s has been dominated by state owned enterprises (SOEs) which were established either under the supervision of the central ministry or the local government. Sinopec was established in 1983 as an entity to provide more structure to the industry, acting simultaneously as an overseeing government organ, an industrial association, and a unifying holding company for all petroleum and petrochemical companies which were formerly under the supervision of various ministries and local government. In 1989, Sinopec accounted for 91 percent of China's ethylene output, 76 percent of synthetic rubber output, and 59 percent of plastics output (Nolan 2001).

281. The transition of China from a centrally planned economy to a "market based" economy was accelerated in the 1990s, and rapid economic growth has led to exponential growth in demand for chemicals. As a result, Sinopec's output of its key petrochemical products has grown rapidly, but it has not been able to meet the increased demand both in terms of quality and quantity. This is because many state owned enterprises had old, small outdated plants which were extensively overmanned as they served both a normal business function and a social function (schooling and hospitals).[149] The increase in imports and foreign direct investment has made the restructuring of state-owned enterprises a pressing issue for the Chinese government.

282. Imports of petrochemicals increased, due to increase in chemical demand and reduction of chemical tariffs even before China's accession to the WTO. Imports were further accelerated with China's accession, as China began to lower tariffs on basic and intermediate chemical products according to its commitments made in line with the Chemical Tariff Harmonization Agreement (Table 18). As a result, only 30% to 60% of domestic demand in plastics was satisfied through domestic production (see Table 19). The liberalisation in the input sector may have been one of the factors contributing to the higher growth in exports of plastic products compared to that of total exports (Figure 53).

283. FDI into China begun in the 1980s and 1990s, and accelerated in the mid 1990s, as discussions on China's WTO accession intensified, a legal framework for FDI was established, and China became more open to FDI. Multinationals in the chemical industries have competed to participate in this growing market, although the Chinese government continues to require permits especially for large scale projects.

Table 18. China's tariff schedule after accession to WTO

		(tariffs in percent)						
	Before accession	2002	2003	2004	2005	2006	2007	2008
Polyethylene (PE)	15.4	14.2	12.9	11.6	10.3	9.1	7.8	6.5
Polypropylene (PP)	13.9	10.0	10.0	10.0	9.7	8.6	7.6	6.5
Polyvinyl chloride (PVC)	13.9	12.8	11.8	10.7	9.7	8.6	7.6	6.5
Polystyrene (PS)	13.9	12.8	11.8	10.7	9.7	8.6	7.6	6.5
ABS polymer	13.9	12.8	11.8	10.7	9.7	8.6	7.6	6.5
Phenol	7.0	5.5	5.5	5.5	5.5	5.5	5.5	5.5
Caprolactum	12.5	10.8	9.0	9.0	9.0	9.0	9.0	9.0
PTA	13.9	12.8	11.8	10.7	9.7	8.6	7.6	6.5

Source: Compiled by Secretariat from WTO data.

149 Data available for 1998-2000 places SOE employment in chemicals and chemical fibres at 1,979,000 in 1998, decreasing to 1,455,000 in 2000, which is roughly 10% of total manufacturing employment.

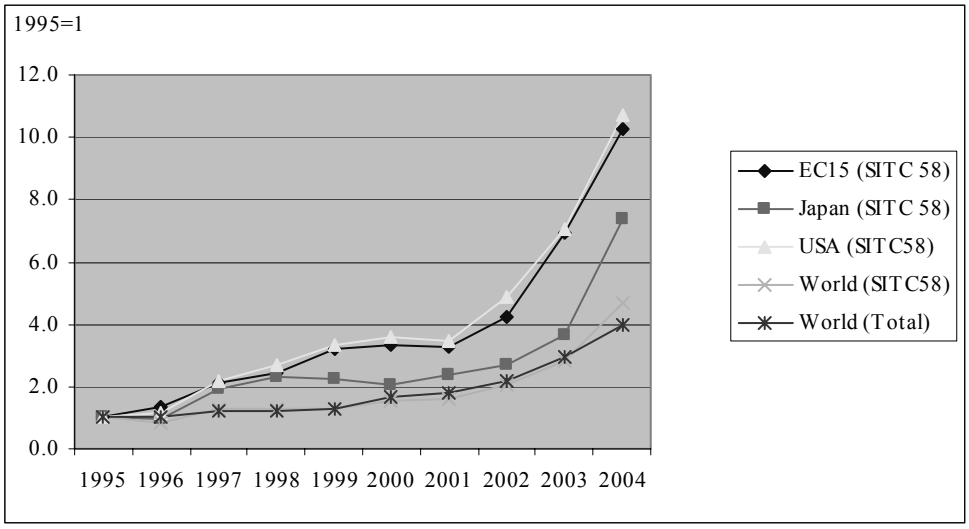
Table 19. China's production and imports of major plastics

(000 t)

	1997		2002	
	Production	Imports	Production	Imports
Polyethylene (PE)	2152 49%	2283 51%	3542 44%	4559 56%
Polypropylene (PP)	1881 60%	1253 40%	3761 61%	2442 39%
Poly vinyl chloride (PVC)	1536 66%	783 34%	3392 67%	1701 33%
Polystyrene (PS)	340 24%	1103 76%	897 38%	1453 62%

Source: Secretariat using data from Heavy and Chemical Industries News Agency (2004).

Figure 53. China's Exports of plastic products



Note: SITC rev3. Category 58 Plastics in non-primary forms

Source: Secretariat from WITS database.

284. The integration of China into the global market has triggered a restructuring of industry. In 1998, the State Council created two new large vertically integrated oil and petrochemical companies (the new CNPC and Sinopec) reshuffling the former respective monopolies in oil and petrochemicals. This has introduced some competition in former monopoly markets. Both CNPC and Sinopec separated their core businesses (i.e. various oil and gas related sectors and petrochemicals) as individual subsidiaries from the non-core businesses and social functions, such as schools and hospitals,[150] and subsequently listed their core business subsidiaries (Petrochina, Sinopec) on the international stock exchange[151] to raise the capital for restructuring.

150 However, it should be noted that both CNPC and Sinopec Corp have retained non-core businesses and social functions which employ more than 800,000 and 600,000 people respectively, a large fraction of which do not create any income.

151 PetroChina was listed in the New York and Hong Kong Stock Exchange in April 2000, and the IPO accounting for 10 percent of its shares raised $2.89 billion. Sinopec was listed in the stock exchanges of

285. Petrochina and Sinopec have pressed ahead with restructuring,[152] and have succeeded in posting considerable profits. However, this may be because of high profits in the petroleum sector,[153] and because much of the overhead costs borne by the parent company are not included. As a part of the restructuring, Sinopec and CNOOC have decided to set up foreign joint ventures with major global players, which produce a wide range of products from upstream (ethylene and aromatics) to downstream (polymers and organic intermediates) and is competitive on a global scale (Figure 54). This new capacity enhances production of petrochemicals measurably, for example accounting for 30% of total ethylene production in China. In 2005, Sinopec and PetroChina announced additional plans to invest in several global-scale olefin units on their own after 2008. Although it is uncertain whether these plans will be actually realized, such plans are a reflection of the Chinese government's strategy to use knowledge acquired through joint-ventures to restructure Sinopec and PetroChina's business as a whole.

Figure 54. Major Sino-foreign petrochemical joint ventures

Major Partners	Location	Capacity (000 tons/yr)	Completion
Sinopec / BP	Shanghai	900	2005
Sinopec YPC/ BASF	Nanjing	600	2005
Sinopec/ Exxon Mobil / SaudiAramco	Fujian	800	2008
CNOOC/ Shell	Guangdong	800	2005

Source: Secretariat from various sources.

286. Many Chinese chemical companies in the meanwhile have run into serious difficulties, and this has led to an increasingly frequent use of anti-dumping duties. Between 1999 and 2004, there have been 110 antidumping investigations initiated, 86 of which were related to the chemical sector, and over 50 have led to imposition of duties, with some pending results (Table 20). The number of countries being subject to anti-dumping duties raises some doubt as to whether there indeed is "dumping" (Table 21). There may be a possibility that anti-dumping duties are being used as a form of safeguards mechanism. In some cases, imposition of duties have not led to decrease in imports, and simply resulted in a change in the country of origin, making it necessary to expand the countries subject to investigation. This was indeed the case in acrylates where the investigation was expanded from the original three countries to seven countries.

Table 20. China's anti dumping investigations by year and by sector

Importing Member	1995	1996	1997	1998	1999	2000	2001	2002	2003	2004	Jan.-June 2005	Totals:
China, P.R.	0	0	0	0	0	6	14	30	22	27	11	110
Totals for 01/01/95 - 30/06/05	157	225	243	256	354	292	364	312	232	212	96	2743

New York, Hong Kong and London in October 2000, with the IPO accounting for 21.21 percent of the shares and raising $3.73 billion. Shareholders include companies such as BP Amoco, Exxon Mobil and Shell.

152 Sinopec states in its 2003 Annual Report that it had a plan to reduce the number of employees by 100,000 persons by means of retirement, voluntary resignations and/or redundancy within the 5 years period from 2001 and 2005. In its 2004 Annual Report, it states that the accumulative number of persons laid off by the end of 2005 will amount to 140,000 and that the workforce size is expected to be around 370,000.

153 In 2003, Sinopec had 37 billion yuan of operating income, of which only 2 billion or 5.8% was from petrochemicals. PetroChina had 99 billion yuan of operating income, of which 1 billion or 1.1% was from petrochemicals (Heavy and Chemical Industries News Agency (2004)).

Importing Member	Mineral etc	Chemicals etc	Plastics and Articles thereof	Leather and related products	Textiles and textile articles	base metals and their products	Machinery etc.	total
China, P.R.	4	60	26	8	4	5	3	110
All countries	63	546	362	121	188	803	225	2743
Per centage of total	6%	11%	7%	7%	2%	1%	1%	4%

Source: WTO website.

Table 21. Antidumping duties imposed by China in chemicals (1999-2005)

Year of Initiation	Year of Imposition	Product	Country	Definitive Anti-dumping Duties	
				Low	High
1999	1999	Polyester film	Korea	13	46
1999	2000	Acrylates	Germany, Japan, US	0	69
2000	2002	Methylene chloride	France, Germany, Korea, Netherlands, UK, USA	None	66
2001	2001	Polystyrene	Japan, Korea, Thailand	None	
2001	2002	Lysine	Indonesia, Korea, USA	None	
2001	2003	Pet chip	Korea	5	52
2002	2003	Catechol	EU	20	79
2002	2003	Purified Anhydride	India, Japan, Korea	1.4	66
2002	2003	Styrene butadiene	Japan, Korea, Russia	0	38
2002	2003	Poly vinyl chloride	Chinese Taipei, Japan, Korea, Russia, USA	6	84
2002	2003	Toluene Diisocyanate	Japan, Korea, USA	3	49
2001	2003	Caprolactum	Belgium, Germany, Japan, Netherlands, Russia	5	28
2001	2003	Acrylates	Indonesia, Korea, Malaysia, Singapore	2	49
2002	2003	MDI	Japan	None	
2002	2004	Phenol	Chinese Taipei, Japan, Korea, USA	3	144
2003	2004	Chloroform	EU, India, Korea, USA	32	96
2003	2003	Ethanolamine	Chinese Taipei, Germany, Iran, Japan, Malaysia, Mexico, USA	None	74
2003	2005	Chloroprene Rubber	EU, Japan, USA	2	151
2003	2005	Hydrazine Hydrate	France, Japan, Korea, USA	28	184

Source: Secretariat from WTO notification G/ADP/N series.

287. The imposition of antidumping duties have led to temporary relief in some cases. This was the case for polyvinyl chloride (PVC), where provisional antidumping duties in 2002 allowed companies such as Jinhua chemical to substantially reduce its losses. However, these duties also allowed other companies such as Beijing No 2 Chemical Co Ltd, Hebei Cangzhou, and Shanghai chlor-alkali to double their profits[154]. The varying level of antidumping duties between countries and companies may also distort markets.

288. As of now, the petrochemical industry in China is part market driven, part state driven. Although the restructuring of the formerly state owned sector is progressing, it is unclear how the restructuring of the smaller chemical companies under the umbrella of Sinopec and PetroChina is progressing. Even as

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recently as the end of year 2000, of a total of 4.3 million tons of ethylene capacity, most existing facilities were of suboptimal capacity (only seven have an annual capacity above 400,000 tons, and the other eleven have a capacity of less than 200,000 tons), and geographically dispersed (18 ethylene crackers located at 16 sites (Heavy and Chemical Industries News Agency (2004))). Allowing inefficient state-owned enterprises to survive either through continued subsidies or trade measures may allow these companies to continue to invest in non-viable assets. Imposition of anti-dumping duties may be detrimental if it cushions industry from market forces and enhances rent seeking.

Mexico and Saudi Arabia

289. The petrochemical industries in both Mexico and Saudi Arabia have strong ties with their petroleum industries. While the petrochemical industry in Saudi Arabia has shown steady growth since its birth in the 1980s, the petrochemical industry in Mexico has remained surprisingly small despite its potential in terms of sizeable petroleum reserves, sizeable domestic market, and proximity to larger markets such as the U.S. and Latin America. Here, we will briefly look back at how the petrochemical industries have developed in these two countries.

290. In Mexico, the petrochemicals industry has historically been considered a part of the oil industry, and many petrochemical sub-sectors were reserved for Pemex, the state-owned petroleum company, which remains the sole supplier of certain petrochemical products. Because of the dependence of government revenues on oil, both the oil and the petrochemical sector have been subject to considerable under-investment. Despite its advantages, the Mexican petrochemical industry remains relatively small, with 1.3 million tons per year of ethylene capacity[155]. Petrochemicals reserved for Pemex have been gradually reduced, opening up new petrochemical sub-sectors to private investment. NAFTA which went into effect in 1994 presented an opportunity and challenge to the industry, providing new access to a huge market while intensifying competition in the Mexican market.

291. The Mexican government attempted to restructure the industry by privatizing Pemex's petrochemical activities in 1995, but failed, facing strong opposition from labour and continuing sentiments against foreign ownership of strategic sectors. The Mexican government nonetheless pared down the list of products reserved for Pemex from 19 to 8, and opened up many sub-sectors to foreign capital with the intention of promoting the restructuring of industry and promoting investment. Subsequently, the Government proposed to sell minority holdings (49%) in Pemex plants; however, private firms were reluctant to invest in expansions over which they would have limited management control, and the process was declared void. Other creative solutions have been considered but have not worked.

292. Thus, despite Mexican government's efforts, the petrochemical sector in Mexico continues to be underinvested despite its potential. This has resulted in rising trade deficits in the area of chemicals (Table 22). Some reasons that the private sector has been unwilling to invest are because a) availability and prices of key feedstock remain under state-control; b) the Mexican government is unwilling to provide long term guarantees of steady supply of feedstock at prices acceptable to industry;[156] and c) frequent changes in the Mexican government's stance has invoked a wait and see attitude on the side of the private sector. Pemex has announced its intention to enter into a joint venture with private groups and multinationals to build a world scale naphtha cracker (Phoenix project, 2008/2009), although details still need to be hammered out.

155 Singapore, Thailand, and Malaysia all had between 1.6 – 1.9 million tons of capacity in 2003, and Chinese Taipei and Korea had a capacity of roughly 3 and 6 million tons capacity respectively.

156 Current law requires Pemex to sell state-produced ethane and other petrochemical feedstock at international market prices, which is tied to U.S. natural gas prices. It seems this does not provide sufficiently attractive prices to make a substantial investment from industry's point of view.

Table 22. Mexico's trade in organic chemicals

(USD million)

	1990	1991	1992	1993	1994	1995	1996	1997	1998	1999	2000	2001	2002	2003	2004
Export	574	734	755	817	838	1219	916	890	786	811	1009	872	880	1064	1270
Import	1063	1347	1497	1503	1794	1999	2135	2681	2583	2847	3507	3377	3462	4002	4927
Balance	-489	-613	-742	-686	-956	-780	-1219	-1791	-1797	-2036	-2498	-2506	-2583	-2938	-3657

Note: SITC Rev.2, 51 Organic Chemicals

Source: UN, COMTRADE database.

293. In Saudi Arabia, the petroleum and petrochemical sectors have been managed by different entities. While Saudi Arabian Oil Company (Saudi Aramco), a 100% state owned company, is responsible for petroleum, the Saudi Arabian Basic Industries Corporation (SABIC) is the main petrochemical producer. It is currently 70 per cent state-owned and 30 per cent privately held. It has two large industrial sites in Saudi Arabia and operates 18 manufacturing affiliates most of which are joint ventures with international companies, such as Exxon Mobil, Shell Oil, Hoechst-Celanese, and SPDC (a consortium of Japanese companies). Although initially the projects used off gases emitted in the oil drilling process, other hydrocarbons are increasingly being used. Domestic NGL prices are discounted to provide investment incentives.[157] Leveraging the cheap ethane feedstock, and using the capital, technology, and marketing capabilities of foreign partners, SABIC has grown very rapidly investing aggressively both at home and abroad which has been reflected in the rapid increase in exports (Table 23). Ethylene capacity increased from 3.5 million tons in 1999 to 6.8 million tons in 2004. Moreover, it acquired the petrochemical business of DSM (Dutch State Mining), making it the world's 3rd producer in polyethylene, 6th in polypropylene, and 11th in the global rankings in chemicals as a whole.

Table 23. Saudi Arabia's trade in organic chemicals

(USD Million)

	1990	1991	1992	1993	1994	1995	1996	1998	1999	2000	2001	2002
Export	1003	935	1866	970	1347	1866	1792	1787	1718	2567	2658	2843
Import	158	190	174	188	206	319	343	332	317	337	333	312
Balance	845	745	1692	782	1142	1547	1448	1454	1401	2230	2324	2531

Note: SITC Rev.2, 51 Organic Chemicals

Source: UN, COMTRADE database

157 The Saudi government states that domestic NGL prices are based on international market prices adjusted for various factors such as cost savings in infrastructure, marketing, commercial advantage associated with long term, large volume contracts with less volatility. See WT/ACC/SAU/61 page 12 to 13 for details.

The Adjustment Challenge Going Forward

294. As we have seen, Asia and the Middle East have greatly increased their global presence (Table 24). Going forward, both developed and developing countries face a number of structural adjustment challenges in this sector as demand and supply patterns change considerably.

Table 24. Diffusion of global ethylene capacity

(000 tons)

	1980 (*)		1995		2000		2005	
N. America								
United States		39.5%	22649	28.6%	26317	27.3%	28844	25.1%
Canada		4.0%	3160	4.0%	3853	4.0%	5332	4.6%
Mexico			1418	1.8%	1418	1.5%	1618	1.4%
S. America		4.2%	3103	3.9%	3978	4.1%	4435	3.9%
Europe		34.4%	26187	33.1%	27123	28.1%	30479	26.5%
Africa		0.3%	1255	1.6%	1255	1.3%	1565	1.4%
Middle East		1.1%	4090	5.2%	6656	6.9%	10696	9.3%
Asia			16838	21.3%	25338	26.3%	31583	27.5%
India			525	0.7%	2395	2.5%	2401	2.1%
Thailand			665	0.8%	1701	1.8%	2282	2.0%
Singapore			420	0.5%	990	1.0%	1890	1.6%
Malaysia		2.4%	230	0.3%	960	1.0%	1560	1.4%
Indonesia			510	0.6%	510	0.5%	510	0.4%
Ch. Taipei			1015	1.3%	1465	1.5%	2715	2.4%
Korea			3570	4.5%	5000	5.2%	5700	5.0%
China			2510	3.2%	4475	4.6%	6925	6.0%
Japan		13.6%	7393	9.3%	7842	8.1%	7600	6.6%
Australia		0.6%	465	0.6%	465	0.5%	505	0.4%
World		100.0%	79165	100.0%	96443	100.0%	115012	100.0%

Source: 1980 figures from OECD(1985), Figure 28. Other data from Japan Petrochemical Association.

295. Market growth of petrochemicals in developed countries is expected to be modest (between 0 to 4 percent) going forward because of low GDP growth and decline in the share of manufacturing industries[158]. Asia, especially China, is expected to continue to be the region for demand growth due to its emerging position as the global centre for manufacturing of semi-finished and finished goods and increasing domestic consumption of the huge population base (Table 25).

Table 25. Global ethylene derivative demand (ethylene equivalent: million tons)

	Total	Asia							W.Europe	N.America	Middle East
			Korea	Ch. Taipei	China	ASEAN	India	Japan			
2003	97.6	35.8	3.8	2.6	15.4	4.6	2.8	5.6	22	23.8	2.3
2009	132.8	52.8	4.6	3.6	26.3	6.3	5	5.5	25	30.3	4.1
03-09 growth	35.2	17	0.8	1.1	10.9	1.6	2.3	-0.1	3	6.5	1.8
av. growth rate	5.3%	6.7%	3.1%	5.9%	9.3%	5.2%	10.4%	-0.2%	2.1%	4.1%	10.1%
Share(2003)	100%	37%	4%	3%	16%	5%	3%	6%	23%	24%	2%
Share(2009)	100%	40%	3%	3%	20%	5%	4%	4%	19%	23%	3%

Source: Ministry of Economy Trade and Industry, Japan.

296. Despite political uncertainties, the Middle East is pressing ahead with major capacity additions despite low local demand, and will clearly turn into a major production centre/exporter for petrochemicals.

158. Assessment of the future market in petrochemicals stated in the following paragraphs are based on MITI (2005). While figures differ, the general trend is supported by other studies such as CEFIC (2004).

This is especially true for ethylene-derivatives where the Middle East has a great competitive advantage in terms of low-cost ethane (Table 26). However, this competitive advantage may not hold for other petrochemicals such as derivatives of propylene, butadiene and aromatics. Thus, it is expected that these products will be produced and consumed mainly in consuming countries including Asia. China despite capacity increase, is widely expected to continue to be a huge importer, at least in the short to medium term, because of lack of feedstock and investment capital. Thus the general picture would be for Middle East exporting and Asia, especially China importing (Figure 55, Table 27). The United States, Western Europe, and Japan who have traditionally been exporters will see a further erosion of their export positions due to increased competition from the Middle East and Asia, especially if the restructuring of their respective industries is delayed. Delays in restructuring may also have negative effects on the growth of other higher value added sectors if resources are unnecessarily tied up in non-performing assets.

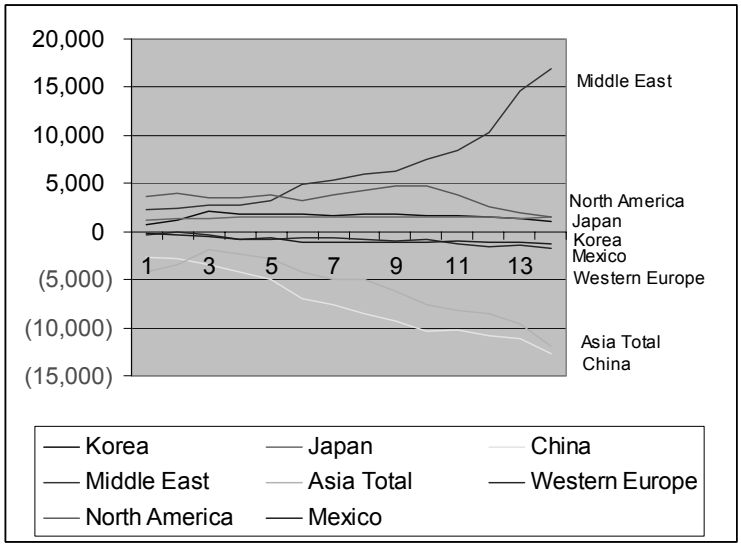
Table 26. Global ethylene production capacity (ethylene equivalent: million tons)

	Total	Asia							W.Europe	N.America	Middle East
			Korea	Ch.Taipei	China	ASEAN	India	Japan			
2003	116.6	36.4	5.9	3.6	8.5	7.3	3	8	25.5	32.4	8.9
2009	149.1	49.4	6.1	4.5	17.9	8.1	5	7.8	26.4	32.9	23.3
03-09 growth	32.5	13	0.2	0.9	9.4	0.8	2	-0.2	0.9	0.6	14.4
av. growth rate	4.2%	5.2%	0.5%	3.7%	13.2%	1.7%	8.9%	-0.4%	0.6%	0.3%	17.4%
Share(2003)	100%	31%	5%	3%	7%	6%	3%	7%	22%	28%	8%
Share(2009)	100%	33%	4%	3%	12%	5%	3%	5%	18%	22%	16%

Source: Ministry of Economy Trade and Industry, Japan.

Figure 55. Global ethylene derivative balance

(ethylene equivalent: million tons)



Source: Ministry of Economy Trade and Industry, Japan.

Table 27. Global ethylene balance (ethylene equivalent: million tons)

		Total	Asia							W.Europe	N.America	Middle East
				Korea	Ch.Taipei	China	ASEAN	India	Japan			
2003	Production	99.1	30.8	5.6	3.1	6.8	5.5	2.6	7.1	21.2	28.0	8.3
	Demand	97.6	35.8	3.8	2.6	15.4	4.6	2.8	5.6	22.0	23.8	2.3
	Balance	1.4	-5.0	1.8	0.5	-8.5	0.9	-0.2	1.6	-0.8	4.2	6.0
2009	Production	131.7	40.8	5.7	3.6	13.6	6.8	4.2	7.0	23.2	31.8	21.0
	Demand	132.8	52.8	4.6	3.6	26.3	6.3	5.0	5.5	25.0	30.3	4.1
	Balance	-1.1	-12.0	1.1	-0.1	-12.7	0.5	-0.8	1.5	-1.8	1.5	16.9

Source: Ministry of Economy Trade and Industry, Japan.

297. The protection effect of tariffs in the chemical sector will be further eroded on a global basis as 1) the increase of chemical trade lead to international price convergence, 2) increased trade and investment in textiles and clothing, electronics, automobiles, and increased competition in these user industries, will mean that chemical companies will have less leverage in setting high domestic prices, with or without tariffs. Chemical tariff levels are also expected to fall further as a result of multilateral or regional trade liberalization. Thus, there will be an increasing need for structural adjustment in this sector in many countries, especially in the OECD countries where market growth is low and there may be considerable existing production capacity.

298. International oil prices are expected to remain quite high for the foreseeable future, and natural gas prices in the United States which have risen from levels of two to three dollars per million BTUs to eight dollars and higher, also are expected to remain high despite some increase in supply through imports. Energy prices which have a great impact on the relative competitiveness of industries, will remain a driving force for structural adjustment in many countries.

299. Other factors as environmental regulations and chemical safety may also affect industries' ability to adjust to structural change. There is also the possibility that new technology such as plastics made from biological sources completely changes the conditions of competition. It is generally expected that the above structural adjustment in the petrochemical sector would not lead to the end of production in developed countries mainly for the reasons outlined earlier. The chemicals industry will continue to rely on basic petrochemical feedstock for much of its activities. However, there is no denying that the additional capacity in commodity chemicals will be in the energy rich regions of the world such as the Middle East which enjoy a clear comparative cost advantage, and countries with a growing market such as Asia.

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