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The Impact of Pro-Competitive Reforms on Trade in Developing Countries

Sébastien Miroudot,

Enrico Pinali,

Nicolas Sauter

OECD

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THE IMPACT OF PRO-COMPETITIVE REFORMS ON TRADE IN DEVELOPING COUNTRIES

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By Sébastien Miroudot, Enrico Pinali and Nicolas Sauter

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ABSTRACT

This report proposes an analysis of the mutually reinforcing relationship between trade, investment and competition policies and how together they impact trade in developing countries. An index of pro-competitive reforms is provided for 82 countries over the period 2001-2005. The index synthesises 13 indicators of the policy stance of countries with regard to trade, investment and competition. It is then used in quantitative analysis to determine the impact of barriers to competitive markets on trade. The results shows that there are substantial gains for developing countries in market and regulatory reforms in terms of higher trade flows and higher income per capita. Moreover, the paper further examines pro-competitive reforms in key services sectors and the extent to which trade agreements can promote them through the experience of the WTO telecoms Reference Paper. The analysis highlights that countries achieved a high degree of liberalisation in the telecoms sector and that regulatory principles of the Reference Paper were useful in promoting sound policies under domestic regulatory reforms of the sector.

Keywords: trade liberalisation, trade and competition, trade and investment, pro-competitive reforms, regulatory reforms, gains, indicators, gravity, Reference Paper, telecoms, telecommunications.

JEL-codes: F12, F14, L50, L96.

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EXECUTIVE SUMMARY

Recent work inside and outside of the OECD has emphasised the importance of competitive markets in maximising the gains from trade liberalisation. This report proposes an analysis of the mutually reinforcing relationship between trade, investment and competition policies and how together they impact trade in developing countries. It further examines pro-competitive reforms in key services sectors and the extent to which trade agreements can promote them through the incorporation of disciplines that go beyond trade.

In Part I of the report an index of pro-competitive reforms has been created. The index synthesises 13 indicators, some of which are already synthetic indicators of several variables. It includes competition indicators, such as the degree of government intervention and price controls in the economy, an antitrust law index and variables on the cost of licenses and permits and administrative burdens on start-ups. Investment policy is assessed through an index of policies towards foreign investment and indicators of investment protection. Lastly, trade policy is accounted for through an index of the general orientation of trade policies and indicators on time for exports and imports (all these indicators focus on trade in goods due to data limitations in the case of services). The aggregate index is weighted on the basis of factor analysis and provided for 82 countries over the period 2001-2005.

There are interesting findings in the analysis of the results of the index. To begin with, there is a net difference between the low index score of high-income countries –indicating an inclination toward pro-competitive policies– and the high value of the index in developing countries. The highest index scores are found in the group of low-income countries. By looking at the decomposition of the index into its three components (trade, investment and competition), trade policy seems to be the policy that explains most of the cross-country differences, followed by investment policy. Not only do developing countries have a higher index score, thus reflecting less competitive markets, but they also show no clear sign of an improvement in the situation in the last five years, with the exception of low-income countries where the index shows a slight improvement (*i.e.*, the index decreased slightly).

The index of pro-competitive reforms is then used in quantitative analysis to determine the impact of barriers to competitive markets on trade. A variation of the gravity equation is used to show that there is a positive and significant relationship between pro-competitive policies and the volume of trade. Countries with a higher index score, which implies less competitive markets, trade less than their counterparts with a lower index score. A 1% decrease in the index score of a country is likely to increase its exports by 0.33% and its imports by 0.76%. There is an additional increase in exports when the partner country also improves its index score. The model points out that if the average index in developing countries was at the same level as in high income OECD countries, their exports would be on average 29.7% higher and their imports 36% higher. The analysis also shows that this result is not solely driven by the trade component of the index but that investment and competition policies also matter in promoting trade.

Moreover, Part I of the study introduces a growth equation that relates income per capita to factor accumulation and trade openness. Using the results from the gravity estimation and the simulation of the increased trade implied by pro-competitive reforms that would bring developing countries to OECD best practice levels, it is possible to show that the gains in terms of income per capita range from 3.5% to 10.5%. The wider the gap between a country's index score and high income OECD countries' average, the larger the gains. Developing countries are the ones that have the most to win in market and regulatory reforms.

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As the analysis in Part I is limited to trade in goods and pro-competitive policies are also important for trade in services, Part II focuses on the experience of the WTO telecommunications reference paper and regulatory reforms in key services sectors. In particular, it examines the extent to which trade agreements can play a role in promoting pro-competitive reforms by including disciplines that touch upon investment, competition and market regulation.

The experience of the telecommunications reference paper can be described as successful as most countries have achieved a high degree of liberalisation in the sector and the implementation of the six disciplines of the paper has gone relatively well. Three case studies (the Dominican Republic, Malaysia and Sri Lanka) illustrate the value of the reference paper in promoting reforms, and point out some of the difficulties encountered by regulators. It was certainly useful for countries to rely on the disciplines set in the reference paper, but the analysis also shows that broad principles have to be translated into laws, regulations and then interpreted and implemented by regulators; the regulatory reform can only be facilitated to a certain extent by internationally agreed principles.

The analysis then attempts to compare the relevancy to other sectors of the regulatory principles included in the reference paper. Sectors characterized by a natural monopoly (ports and energy) show that pro-competitive reforms need substantial sectoral restructuring to be effective. Other network-based industries (financial services and postal and courier services), while they pose less structural constraints to liberalisation, nevertheless require proper regulatory supervision to prevent system instability and anti-competitive practices. Most sectors deal in varying degrees with regulatory aspects similar to those experienced by the telecoms industry. Issues like the presence of essential facilities, the need for regulation, the goal of universal access, and the appearance of anti-competitive behaviour are among the most recurring ones.

Pro-competitive reforms are essentially domestic reforms and can occur in different ways. As such, they can certainly be carried out in the absence of a trade agreement. There can even be some risks in transforming important reforms into negotiation issues that are then linked to trade interests. However, specific countries can find value in committing to reforms through a trade agreement, and there are potential areas for international co-operation on competition issues in relation to trade and investment. As services liberalisation is also intertwined with domestic reforms, it is a natural area for trade agreements to touch upon domestic reforms, as it is indeed already the case.

It is up to countries to find the best way to move forward in their process of reforms. The study has no strong conclusion on the need for pro-competitive reforms to be part of a trade agreement but emphasises the importance of these reforms and the substantial welfare gains that are at stake.

INTRODUCTION

1.   While trade liberalisation has been progressing at the multilateral and regional levels, some countries have found it challenging to fully exploit the gains to be made from lower trade barriers. One reason is that these gains rely on competitive markets and complementary policies that are required to fully reap the benefits of trade liberalisation.

2.   Pro-competitive reforms can be defined as reforms that aim to increase the degree of competition in a given market. This study focuses on the three main policies that can create opportunities for foreign competitors and enforce competition rules in the domestic market: trade policy, investment policy and competition law and policy. There are other policy areas that could also be regarded as improving the competitive environment of markets, such as policies that aim to improve the reliability of infrastructure or the quality of institutions.

3.   The reason why reforms should be analysed through the pro-competitive lens is that it is competition that shapes the incentives for economies to be more efficient. Most of the gains from competition, investment and trade policies are the result of competitive mechanisms through the reduction of prices, the improvement of productivity or the stimulation of innovation.

The role of trade in enforcing competition

4.   One gain from trade reform is to enhance competition in the domestic market through imports and to prevent domestic producers from engaging in anticompetitive practices. A domestic monopoly will have to sell at a competitive price – the price of the world market – if there is no barrier to trade and consumers can buy an imported good or service that is similar to the one provided domestically. Even in the presence of barriers to trade, a domestic monopoly will not be able to charge the full monopoly price as long as the barrier – such as a high tariff – does not raise the price above this monopoly price. The "imports-as-competitive-discipline" hypothesis has been empirically verified in several studies. Price mark-ups (the difference between the cost and the price of products) fall with import penetration (Tybout, 2001). There is also a negative correlation between the concentration of industries and the level of imports.

5.   Competition policy and trade liberalisation tend to act as complements. While trade disciplines can be efficient in enforcing competition, there are a number of cases where trade policy cannot replace competition policy. Examples include the non-tradable sector and sectors that simply cannot exhibit the characteristics of competitive markets (e.g., natural monopolies). The unique nature of "networked" sectors, such as telecommunications[1], justifies the enforcement of additional, sector-specific pro-competitive disciplines. But the examples are not limited to these sectors, as firms' strategies of product differentiation can make a more general case of markets that are shielded from foreign competition even in the case of free trade. Moreover, certain anti-competitive practices can be aimed at restricting market access for foreigners despite the absence of trade barriers (Cadot, Grether and de Melo, 2000). For

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1 .   This sector is studied in Part II.

example, certain types of vertical arrangements between manufacturers and distributors can prevent foreign companies from selling in the domestic market.

6.   It is therefore interesting to look not only at the impact of trade on competition, but also at the role of competition policies in enhancing trade. The OECD has pioneered such work through a series of papers published by the Economics Department on product market regulation[2].

The relationship between competition, trade and productivity growth

7.   When competition increases in a given market including, but not limited to, the entry of foreign products and services or foreign companies, there are two kinds of effects. First, there is a selection effect as only the most productive firms can stay in the market. The less productive companies are driven out and this reallocation of resources leads to an increase in the average productivity of the economy (Melitz, 2003). This process can be disruptive as the entry and exit of firms inevitably reallocates resources (or incurs adjustment costs). However, at the end of the process the economy is more efficient and productivity is higher – not because firms have increased their productivity, but because only the most productive firms stayed in the market (hence the "selection" process). Higher productivity translates into higher wages and higher levels of income.

8.   The second effect of competition is to create incentives for firms to increase their productivity. To compete with their more competitive counterparts, firms must cut costs, improve production techniques and develop better products and services. The result is also an increase in the productivity of the economy, but this time through the productivity gains of firms and not through the reallocation of resources. It is through these two mechanisms that pro-competitive reforms generally lead to higher growth[3].

9.   While trade reforms help increase the degree of competition in product markets, more competitive markets in turn affect trade flows and trade patterns; it is precisely these effects that are studied in this report. The increase in competition translates into a higher degree of specialisation. The selection effect that has been described above is a reallocation of resources within sectors where the country has a comparative advantage. Reallocation across sectors can be induced by reforms and typically results in a larger number of inputs being imported and larger exports, again as a consequence of specialisation. As trade provides the more efficient inputs that firms have incentives to use through the second effect, the impact of competition on trade flows and trade patterns is reinforced. And further trade in turn stimulates technology diffusion and productivity improvements.

Competition, regulation and reforms

10.   There are several ways of promoting competition so as to benefit from the virtuous cycle of competition, trade and productivity growth described above. First, the entry of more competitive firms should be facilitated. This is one goal of trade and investment liberalisation. It is straightforward that trade liberalisation creates competition between domestic and foreign products, while investment liberalisation allows foreign companies to control domestic assets. But the reduction of barriers to trade and investment also has a role in diminishing the entry and exit costs of companies, facilitating the more efficient use of inputs, and the smooth diffusion of information between firms and towards consumers. Second, for competition to really take place once barriers to entry are removed, anticompetitive practices and collusion

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2.   Nicoletti et al. (1999, 2003), Conway et al. (2005) and OECD (2005).

3 .   There are of course situations in which these mechanisms are not likely to produce the expected outcome. For example, when profitability has been driven to a sub-optimal level in a market and firms have not enough profits to innovate or when a market is structurally uncompetitive and the selection process cannot take place.

should be prevented. This is the role of competition law and policy. As market reforms sometimes imply the transition from former public monopolies to competitive markets (for example, in infrastructure or network sectors), there is also a need for regulatory reforms involving more complex policies to deal with imperfect markets (*e.g.*, natural monopolies).

11.   Trade, investment and competition policies therefore form a package of reforms that can increase the degree of market competition. These reforms can influence the regulatory environment of product and services markets and, in particular, reduce the regulatory burdens that impose constraints on the entry and exit of firms and the diffusion of productivity gains through an environment more conducive to competition. Pro-competitive reforms include the removal of regulatory barriers, but it should also be kept in mind that in some cases market failures require public intervention to encourage competition. That is why market regulation has been the focus of recent work in addition to market liberalisation. It is also important not to lose the focus of the changing landscape of globalisation with the fragmentation of production, the growth of vertical specialisation and outsourcing. Pro-competitive reforms are also policies to adjust to the new context of the global economy.

Competition and development

12.   Many studies have emphasised the importance of competition for development[4]. These studies have highlighted the importance of competition to promote growth (Dutz and Hayri, 2000), the role of competition in market development (World Bank, 2002), and the importance of trade liberalisation rather than antitrust laws to promote competition in developing countries (Hoekman and Mavroidis, 2002). A recent survey of studies on competition and development can be found in Evenett (2005).

13.   There are specificities in developing countries (and especially very poor developing countries) that make the case for pro-competitive reforms even more compelling. Developing countries face many obstacles in attracting and retaining the most competitive firms. They tend to have a limited infrastructure and imperfect financial markets that make it all the more unnecessary to add regulatory obstacles. They have less of a tradition of promoting competition, and the adoption of competition laws in certain developing countries has been very recent or is an ongoing process. Sometimes, they also have a history of state intervention and monopolies that have limited the scope of competition for a long time. Empirical studies also show that certain companies in developing countries operate at productivity levels relatively low in comparison to best-practice levels, suggesting that more competition could translate rather quickly into important productivity gains.

14.   The aim of this study is two-fold. First, to provide a synthetic indicator of the degree of pro-competitive reforms in a large set of developing countries and to include OECD countries for comparison purposes[5]. An index of pro-competitive reforms has been constructed for 82 countries and is studied in Part I. This part also presents the results of analysis of the impact of pro-competitive reforms on trade flows, using a gravity model. In Part II of the report, the role of trade agreements in promoting pro-competitive reforms is examined through the experience of the Telecommunications reference paper and a discussion of the role of pro-competitive reforms in enhancing trade in key services sectors.

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4 .   In 2004-2005, ten case studies on competition, competitiveness and development were discussed in the OECD Joint Group on Trade and Competition. They give concrete examples of how competition can increase export performance and create trade opportunities. See COM/DAF/TD(2005)59 for a synthesis.

5 .   It is not the objective of this study to provide an analysis of pro-competitive reforms in OECD countries as this has already been done with more detailed indicators in Conway et al. (2005) and other studies from the Economics Department.

PART I. A QUANTITATIVE ANALYSIS OF PRO-COMPETITIVE REFORMS AND THEIR IMPACT ON TRADE

15.   Due to the potentially complicated relationships among trade, investment and competition, assessing the degree of reforms and the extent to which countries are "competitive" is not an easy task. A first issue is to compare countries by assessing the national level of competitiveness. Competition is an economic characteristic. Markets can be competitive but not countries (the latter expression typically being used as a metaphor). In a given country there are many markets that have different degrees of competition, and it is not immediately obvious how to aggregate these data into some kind of average level of competition. Relatedly, there is already a vast literature on the difficulties of defining trade policy openness. To extend in a single indicator the analysis to investment openness and competition policies is another challenge.

16.   Nevertheless, there is some usefulness in undertaking such an analysis and to provide a synthetic indicator of "pro-competitive reforms". As emphasised in the introduction, the selection effect and the incentives for productivity enhancement are the mechanisms that link trade, competition and growth. It is not possible to empirically assess these pro-competitive effects by looking at trade policy or competition policy alone. There is a need for an aggregate measure of the policy stance of a nation along this important dimension, which is the likely impact for competition of the leading supply side policies, including trade, investment and competition policy. Moreover, the index of pro-competitive reforms can also be a tool for comparison purposes or benchmarking. Notwithstanding the approximation in the exercise, which is the same for all countries, the ranking of economies is useful information to analyse in a study of different country experiences. As long as the imperfections of the exercise are accepted and understood, there are many lessons to be drawn from such an analysis and a comparison can be made between the average competitiveness of markets in different countries and their trade performance.

17.   To minimise the approximation and to make the data as comparable and meaningful as possible, the index constructed is an indicator of policy stance rather than market performance. Reforms are determined at the country level and it makes sense to compare country policies. Almost all of the indicators gathered deal with policies, regulations and trade barriers rather than directly observable market data or surveys. There is less approximation in assessing policies than in measuring the results of these policies, where it is not clear if what is measured really results from the policies.

18.   The study refers to "pro-competitive reforms" rather than "product market regulations" (PMR) since the indicator built is not as comprehensive as the PMR indicators available for OECD countries. Dealing with developing countries forces us to work at a more aggregated level of data. It is not an important limitation in the analysis, as developing countries are for the most part in the first generation of market reforms, focusing on entry and ownership[6]. The dataset includes countries with a higher heterogeneity of data, with some countries at an early stage in terms of pro-competitive reforms while others are more advanced in implementing their competition policy or liberalising trade and investment.

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6 .   It is necessary to use more detailed data to rank OECD countries because they are in a second generation of regulatory and market reforms and the dispersion of policy stance has diminished (see Conway et al., 2005).

1. The index of pro-competitive reforms

19.	The index of pro-competitive reforms used in this study has been constructed for a sample of 82 countries (including 26 OECD countries). The index is based on 13 indicators that reflect how "pro-competitive" investment, trade and competition policies are. The index has a value between 0 and 1 where a lower index score indicates more pro-competitive policies. The list of indicators and their respective sources are provided in Annex II. They are briefly presented below, with an indication of why they are the key indicators to consider.

a) Competition law and policy

20.	We use several types of data from three different sources to assess market reforms. First, to evaluate the extent of government intervention in the economy, the index relies on two indicators from the Heritage Foundation's *Index of Economic Freedom*: government intervention and price controls. Then, to appraise the extent to which the national competition law can limit private anticompetitive practices, we make use of the Antitrust law index that was developed by Nicholson (2004). Finally, licenses and administrative hurdles when starting up a business are another aspect of uncompetitive markets. We take advantage of the information collected by the World Bank in its *Doing Business* database on licensing costs and procedures, the time required to start a business, and the number of procedures needed to register a business or property.

Government intervention and price controls: Scores from the Index of Economic Freedom

21.	The *Index of Economic Freedom* was designed to determine how freely countries can respond to dynamic global market conditions (Miles *et al.*, 2006). Each country receives its scores for various indicators based on a scale of 1 to 5. A score of 1 suggests that an economy is relatively free, while a score of 5 implies that the country has little relative economic freedom. The first indicator measures the level of government intervention in the economy. The higher the rate of government consumption as a percentage of GDP, the more resources the government is pulling from the private market, lowering its level of economic freedom and raising its *Index* score. Thus, it indicates the size of the state-owned sector using the share of revenues from both state-owned enterprises and government-owned property. The second indicator measures the relative degree of government control over wages and prices. A low score indicates wages and prices that are set almost completely by the market. A high score suggests that wages and prices are regulated entirely by the government.

The Antitrust Law Index

22.	To quantitatively assess a country's competition regime, there are not many available options. Most indicators are based on surveys conducted among "consumers" of competition agencies (such as companies, business or consumer organisations, and lawyers). There are reports like the *Global Competitiveness Report* from the World Economic Forum (WEF). Unfortunately, they do not cover enough developing countries and surveys are not always a good source of information as respondents can be very subjective in their answers. One methodology based on more objective data (and more comparable across countries) has been developed by Nicholson (2004) – the "antitrust law index". It is an index of the "laws on the book" with no indication of the implementation or efficiency of these laws. The index simply looks at a list of criteria in national laws and assigns a score to each of them. The list of criteria has been reproduced in Annex II. Nicholson (2004) created the antitrust law index for 52 jurisdictions. We extend the number of countries covered to reach the 82 countries of the dataset.

23.	According to Nicholson himself, there is no guarantee that because a competition law includes a larger set of these criteria, it is more efficient or stronger. For example, the United Kingdom has a

relatively low index score of 9, while Zambia has 14 (the highest index score is 21 for the United States). It would be unfair to assess the competition regime of a country on the basis of this sole indicator and the score is clearly influenced by the list of criteria (that includes provisions that are more likely to be found in one model of competition law) and the law tradition (e.g., British common law is known to leave a number of things unsaid in the text of the law). Nicholson (2004) also shows that there is not a good correlation between income per capita and the index he has created. Low-income countries can have very extensive competition laws while traditionally being associated with weaker enforcement of competition (and they tend to have a low rank in the competitiveness reports mentioned). Despite these limitations, we find the index quite useful because countries with no antitrust law will have an index score of zero, while the efforts of some countries to implement a comprehensive antitrust law can be reflected by a higher index score.

Licensing procedures and administrative burdens for start-ups (Doing Business)

24.   Finally, the competition component of the index includes a series of indicators from the World Bank's *Doing Business* database. These indicators focus on the cost and difficulties of completing basic business procedures, such as obtaining a license or permit, or registering a business or property. Competition in a market is not only about the number of companies and their market power, but also how easy it is to enter (and exit) the market. We use two indicators for "licenses and permits" – the number of procedures required to build a standardised warehouse and the fees involved in completing this procedure (measured as a percentage of income per capita). The World Bank collects these data from local construction lawyers, construction firms and public officials. For the administrative burdens on start-ups, we use three other *Doing Business* indicators – the number of procedures to create and operate an industrial or commercial business, the time to complete these procedures and the number of procedures to register property. These data are also collected from lawyers and government officials.

b) Investment policy

25.   There are different dimensions to take into account when analysing investment policy. A broad concept is the "investment climate", which combines an assessment of both the policies and the general economic and political environment of the country. As we are more interested by policies and reforms, we use two indicators which are more specific. The first one assesses the extent to which capital flows are free and the level of barriers to foreign investment, while the second focuses on the protection of investors (both domestic and foreign).

Capital flows and investment policy

26.   This variable from the *Index of Economic Freedom* examines each country's policies toward foreign investment to ascertain the barriers to investment. It is based on a large review of potential restrictions to investment: Restrictions on foreign ownership, restrictions on industries and companies open to foreign investors, performance requirements, restrictions on capital transactions and repatriation of earnings. It also looks at the availability of local financing for foreign companies and provisions in investment codes, in particular related to fair and equitable treatment.

Investment Protection

27.   While the previous indicator reflects the kinds of barriers faced by foreign investors, the second one looks at the protection afforded to any type of investment. The "investment protection" variable from *Doing Business* is the average of three indexes that capture the transparency of transactions, the liability for self-dealing (*i.e.* using "insider" information for profitable transactions) and the shareholder's ability to sue officers and directors for misconduct. It is not the protection of foreign investment in a narrow sense, but

rather the kind of general treatment that the economy offers to all investors. Higher values suggest better investor protection. This indicator deals with corporate governance as well as private enforcement mechanisms, and is thus indirectly related to government policies (but these policies set the rules for companies). It complements the investment policy index, which focuses on barriers to foreign investment.

c) Trade Policy

28.   There is a large debate on how to measure trade policy and its restrictiveness[7]. There are many possibilities in terms of indicators: The trade openness ratio, the average tariff (weighted or not), the measure of the dispersion of tariffs, tariff equivalents for non-tariff barriers, subjective indexes, trade policy restrictiveness indices based on composite indicators or on econometric regressions, etc. Trade policies tend to be highly complex and there is no simple method to give a full account of all the different barriers to trade and how restrictive they are. As a compromise between the different approaches and the availability of data, we use the trade policy factor from the *Index of Economic Freedom* and two indicators from the *Doing Business* database, time for exports and time for imports which are elaborated below. These indicators are based on data which are available only for trade in goods.

Trade policy score

29.   The trade policy score from the *Index of Economic Freedom* is based on the country's weighted average tariff rate, as indicated by imports from the country's trading partners. The lowest score (1.0) is attained for an average tariff rate of less than (or equal to) 2.5%, while any average rate above 20% receives the highest score (5.0). The score is then corrected to take into account non-tariff barriers, customs corruption and other barriers to trade. The complexity of trade policy does not lend itself to a simple indicator and the *Index of Economic Freedom* offers a trade policy factor that combines the objectivity of quantitative trade policy data (the weighted tariff) with a flexible appreciation of other trade barriers (based on an analysis of different trade policy reports, including WTO reports) to correct the score in an appropriate way.

Time for exports and time for imports

30.   These two indicators assess the efficiency of trade policies from the point of view of users. The data from *Doing Business* have been collected by the World Bank from freight forwarders, shipping lines, customs brokers and port officials. It is an important dimension of trade policy which has been for a long time overlooked, such as the role of customs procedures and port facilities. Recently, trade theory has also focused on the idea of time as a potential trade barrier (Hummels, 2001; Nordås et al., 2006). To highlight the importance of this aspect of trade policy – especially when dealing with pro-competitive policies – two indicators have been incorporated in the index for exports and imports. They indicate the total time to complete a standard procedure in the export or import process, from the contractual agreement to the delivery of goods.

31.   With the two last trade policy variables, we have finished the description of the indicators used in the construction of the index. The sample period is 2001-2005 and the data have been gathered for 82 countries. The 13 indicators described have been normalised to obtain values between 0 and 1 where 0 corresponds to the most pro-competitive policies. These normalised data are aggregated in a single index of pro-competitive reforms. We use a statistical method to weight the index (principal component analysis). Instead of assigning a subjective value to each indicator, we look at the data and how much of their variance can be attributed to each variable. The weights obtained are quite satisfying as they are very close from what we would subjectively assign to each category. For example, the Antitrust law index has a

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7 .   See Anderson and Neary (2005) for a detailed analysis of the issue.

very low weight. We have indicated in the previous section that it was not a reliable indicator of the strength of a competition regime. The details on the aggregation methodology and the weights used to construct the aggregate index can be found in Annex III.

2. An overview of pro-competitive reforms in developing countries

32.   The index of pro-competitive reforms offers interesting results. To facilitate the analysis, countries have been grouped according to their region and to their income. The World Bank classification is used in both cases. For geographic regions, this classification includes only low-income and middle-income economies (excluding high-income countries[8]).

a) The index of pro-competitive reforms by region and by income group

33.   Figure 1 shows the average index for developing countries by region. The average index in OECD high-income countries has been added for comparison. Overall, the average index of developing countries is above 0.500 while the OECD high-income countries average is 0.283. Among the regions represented, the differences are less pronounced, although Europe & Central Asia and Latin America & Caribbean have a lower index score (and hence policies more conducive to realising the economic gains from trade). The East-Asia and Pacific region stands in the middle, while Middle East & North Africa, South Asia and Sub-Saharan Africa have index scores higher than 0.600 and similar to each other. Figure 1 also illustrates how developing countries differ from OECD countries. The decomposition of the index into its three main components (competition, investment and trade policies) highlights that competition policies are not the main culprit. Here, the difference between developing countries and the OECD area is not too large. There is clearly a less liberal policy toward investments in developing countries, but it is essentially with trade policies that a huge gap exists.

Figure 1. Average index of pro-competitive reforms by region (2005)
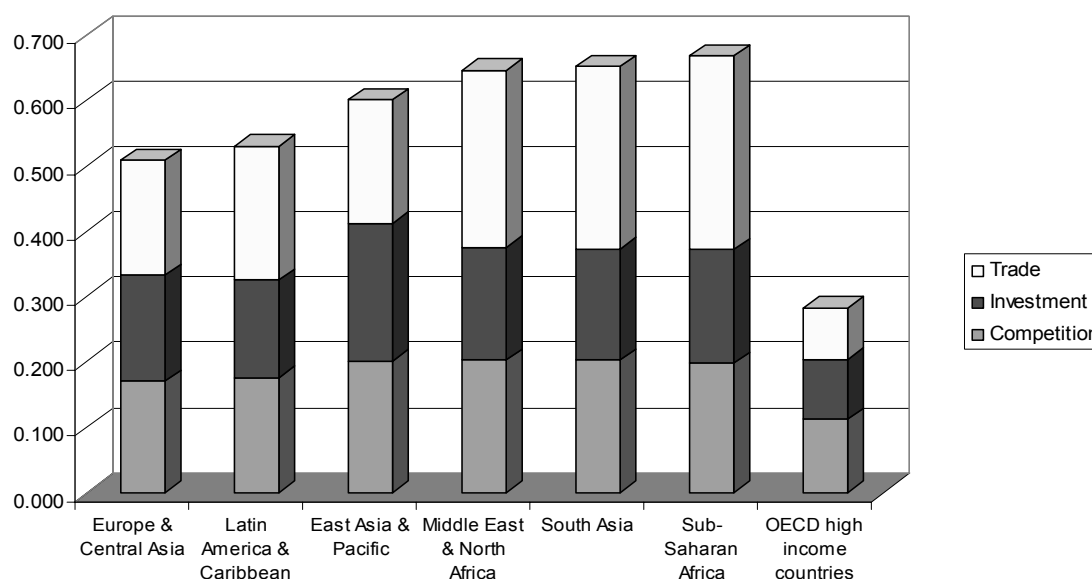
34.   The values of the index for all countries in the dataset can be found in Annex III in Table A7. The country with the lowest index (the most "pro-competitive" policy stance) is Singapore (0.150). Figure 2 focuses on 48 developing countries (excluding OECD and high-income countries) and shows the

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8 .   High-income countries are composed in our dataset of 20 OECD high-income countries and 5 non-OECD high-income countries.

decomposition of the index into its three main components in 2005. One observation is that there are large differences in pro-competitive policies among developing countries. First, the overall score of the index ranges between 0.338 for Chile (CHL) and 0.901 for Zimbabwe (ZWE). But the differences are also significant between the three categories of policies reviewed. For example, the Philippines (PHL) and Madagascar (MDG) have a very similar index score (0.573 and 0.580, respectively). However, the decomposition of the index shows that this similarity in the aggregate index is underpinned by very different outcomes regarding their trade and investment policies. In the Philippines the investment component has a very high unliberal score while trade policy does not appear particularly restrictive. In Madagascar, the investment policy is more favourable but trade policy is restrictive.

35.   Perhaps unsurprisingly, there is a correlation between income levels and pro-competitive policies, as is apparent from Figure 3 which reports the average index score by income group. Low-income countries have the highest average index score (0.703), followed by lower middle-income (0.616) and upper middle-income countries (0.462). High-income countries have the lowest index score, 0.283 for OECD countries and 0.280 for non-OECD high-income countries[9]. It is interesting to see that this last category, which is made up of emerging countries[10], has policies as pro-competitive as OECD countries. The decomposition of the index shows that if non-OECD high-income countries have on average less competitive markets based on the competition indicators, they do better than OECD countries for trade and investment liberalisation. For developing countries, it is again trade policy that causes most of the cross-country differences.

Figure 2. Index of pro-competitive reforms in 48 developing countries (2005)

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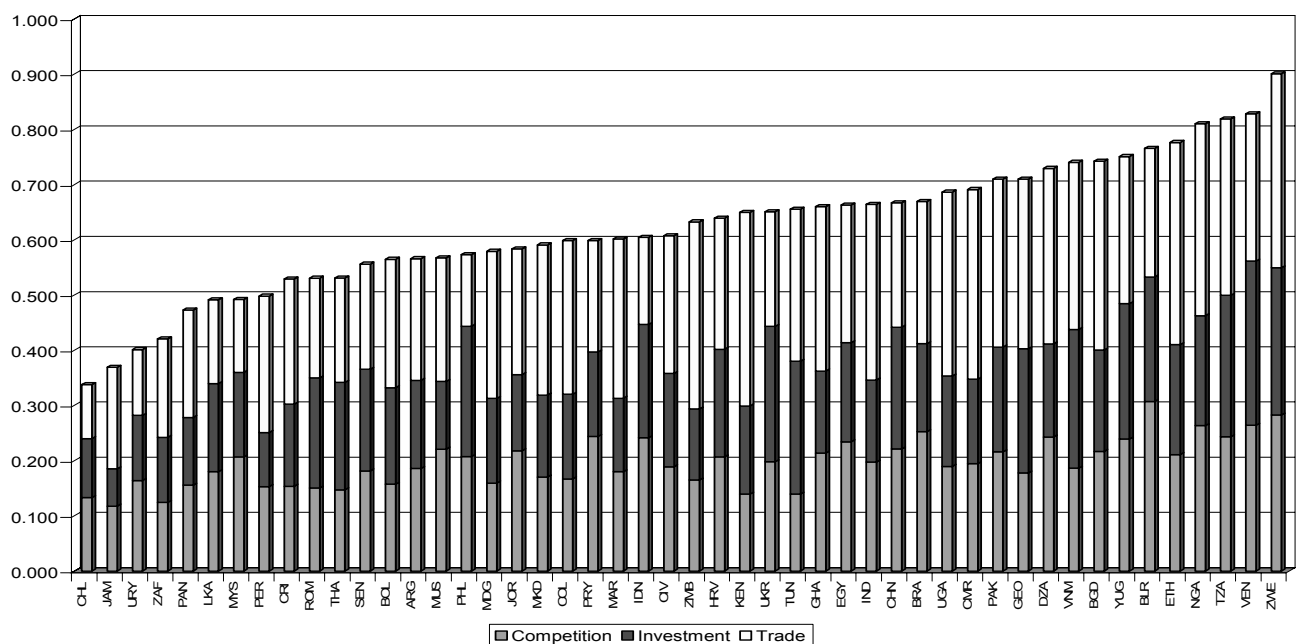
9 .   The median score of OECD high-income countries is however the lowest. The group of non-OECD high income countries is more heterogeneous and includes countries with a very low score (such as Singapore) that decrease the mean.

10 .   In our dataset, high-income non-OECD countries include Chinese Taipei, Hong Kong China, Israel, Singapore and Slovenia.

Figure 3. Index of pro-competitive reforms by income group (2005)
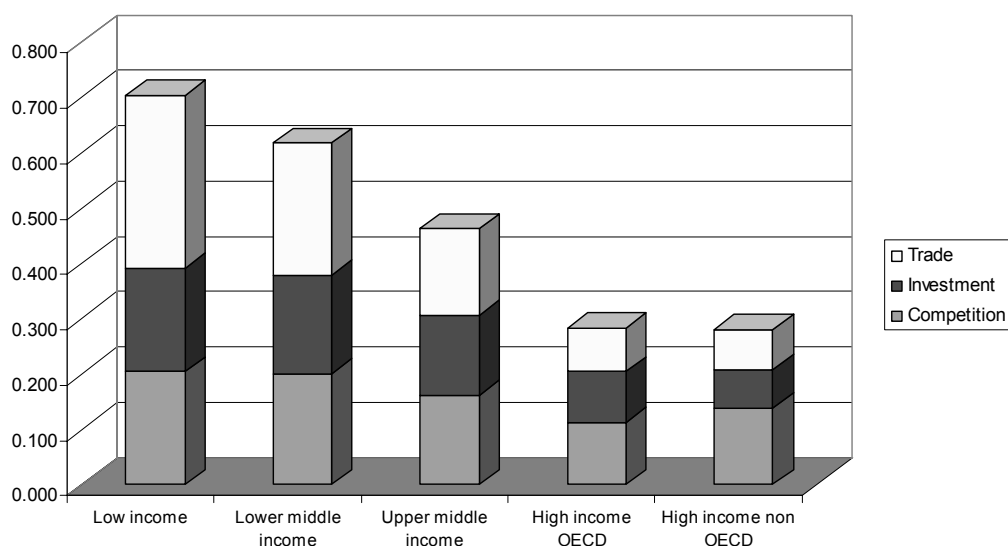
36.   Tables A8 and A9 in Annex III show detailed data for regions and income groups. What is interesting is the relative homogeneity of certain groups. The standard deviation, which measures how spread out the countries are around the average index score, is relatively low for low-income countries. This means that all these countries not only have on average a higher index score, but also tend to be grouped around this high value. To look at data for individual countries also gives the impression that there is a certain degree of homogeneity and it is hard to find countries that have an index score that is very different from the average index score in their region or income group. There is no example of a low-income country with a low index score. The lowest index score in this group is Senegal with 0.556. By comparison, the highest index score among OECD high-income countries is 0.405. The association between low-income and limited pro-competitive policies is consistent across the dataset.

Figure 4. Percentage change in the index of pro-competitive reforms between 2001 and 2005
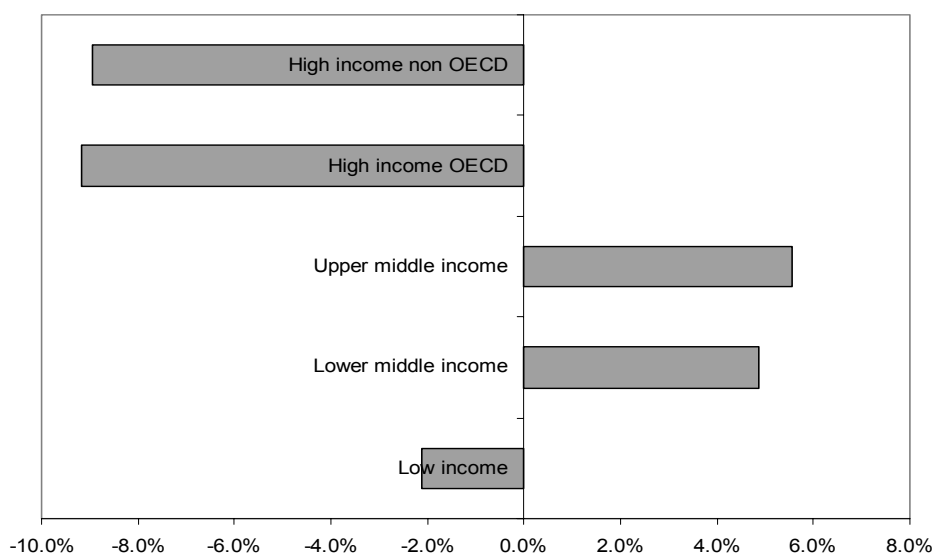
b) Evolution of the index between 2001 and 2005

37.   There are other interesting insights from the analysis of the evolution of the index. Figure 4 compares the years 2001 and 2005 by income group. It represents the percentage increase or decrease in the value of the index, where a decrease means that policies tend to be more pro-competitive. The results are unexpected. The countries where there is a clear reduction in the index score are high-income countries (both OECD and non-OECD). This suggests that these economies, which are already the most competitive, continue to reform their markets to gain competitiveness. In contrast, upper middle-income and lower middle-income countries, which should be catching up, do not seem to have intensified their reforms. And in fact, the index scores indicate a degradation in the degree of pro-competitive reforms. For low-income countries, there is, however, a slight decrease in the average index, a sign that some countries in the group have made strides in the reform process.

38.   By looking at individual country data, Madagascar, India and Senegal demonstrate the best improvements in their index scores (the largest decrease) in the group of low-income countries. China and Brazil have also a noteworthy decrease in the value of their index score in the group of lower middle-income countries, although this group on average had a higher index score in 2005 as compared to 2001. Figure 5 provides the same analysis for regions (excluding high-income countries). The data suggest that only Sub-Saharan Africa, which represents the region with the highest average index score, experienced an improvement in pro-competitive policies. But the percentage change is so small (-0.8%) that it reflects a slight improvement for a limited number of Sub-Saharan economies rather than a regional trend toward more competitive markets. Latin America, however, stands out as a region with a net degradation in the degree of pro-competitive reforms.

Figure 5. Percentage change in the index of pro-competitive reforms between 2001 and 2005, by region
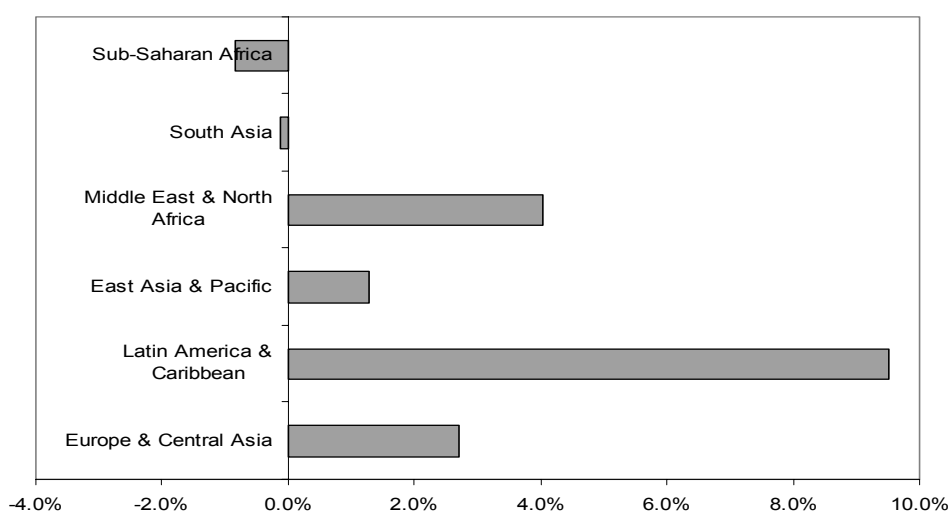
39.   Figure 6 decomposes the changes between 2001 and 2005 by category of reforms. In all countries, the competition component of the index has decreased or stayed unchanged. This suggests that state intervention, price controls, licenses and permits or administrative burdens on start ups have *on average* been reduced in all the countries. Regarding investment policy and protection, it is clearly a category where developing economies seem to lose ground and the increase in this component mainly explains the poor results of lower middle-income and upper middle-income countries. Investment policy also shows up poorly for low-income countries, but it is compensated for by an improvement in competition and trade. The last component of the index, trade policy, is the second explanation for the increase in the average index score of lower middle-income and upper middle-income countries. This is

somewhat surprising since one might expect that some trade liberalisation occurred, particularly at the regional level, where there has been a surge of activity world-wide during this period. However, it is recalled that the index of trade policy we use takes into account not only tariffs, but also non-tariff barriers and more generally any policy that can constrain trade (including customs corruption)[11]. The data show that the score of some countries has been reduced between 2001 and 2005. For high-income countries, there is no increase in any component of the index score. OECD countries have made progress in the three categories, while non-OECD countries have seen improvement in competition and trade policies, whereas investment policy remained unchanged.

Figure 6. Decomposition of the change in the index of pro-competitive reforms between 2001 and 2005, by income group
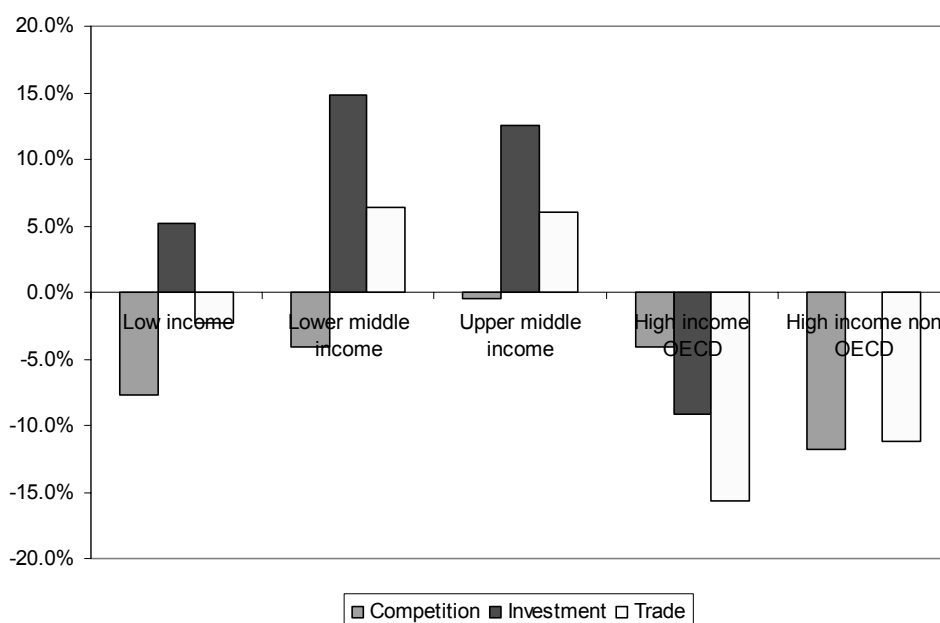
3. The impact of pro-competitive reforms on trade flows

40.   The index of pro-competitive reforms can now be utilized to perform a quantitative analysis of its impact on trade. The gravity model has been widely used in the recent trade literature and in OECD studies. It has successfully accounted for much of the bilateral variation in trade flows for the last 40 years and is regarded as the workhorse of empirical trade analysis. Many variables have been tested in the gravity equation which has the advantage (and the disadvantage) of well explaining trade flows with almost only two variables, distance (corrected by a few indicators on geography and history) and economic mass (GDP). There are several examples of the use of regulatory indicators in a gravity framework (Nicoletti et al., 2003; OECD, 2005).

41.   As 5 years of data are available for the index of pro-competitive reforms (2001-2005), it is possible to create a panel with the 82 countries and their bilateral trade flows and test the impact of the

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11 .   It is beyond the scope of the analysis presented here to explain which specific trade policies have increased the index scores in middle income countries. One can assume that the increased use of anti-dumping duties by these countries is part of the explanation. More details on specific countries' trade policy can be found in the annual publication of the *Index of Economic Freedom* from the Heritage Foundation and in the *Doing Business* report from the World Bank. These two publications were used to determine the trade component of the index of pro-competitive reforms.

index (with more than 20,000 observations). We expect a negative correlation between the index of pro-competitive reforms and the volume of trade (as a lower index reflects a higher degree of reforms). As explained in the introduction, barriers to trade but also to investment and competition are likely to discourage trade and to make countries "under-traders". It means that their trade flows will be lower than the theoretical flows that can be measured through the gravity equation based on distance and economic mass. It is precisely the relationship we want to test. The details of the methodology are in Annex IV. The gravity model estimated includes the following variables: distance, various geographical and historical factors (whether the two countries share a border, a colonial past or a common language), GDP and the index of pro-competitive reforms presented in section 1[12]..

Table 1.   Main regression results from the gravity model

(all variables are logged)	Dependent variable: Exports				Dependent variable: Imports			
	Base model with country and year fixed effects	Pro-competitive indexes (Hausman-Taylor regression)	Interaction term and difference in the degree of reforms	Tariffs	Base model with country and year fixed effects	Pro-competitive indexes (Hausman-Taylor regression)	Interaction term and difference in the degree of reforms	Tariffs
	(1)	(2)	(3)	(4)	(1)	(2)	(3)	(4)
Distance	-1.420***	-1.204***	-1.409***	-1.562***	-1.237***	-1.144***	-1.229***	-1.247***
	(-83.21)	(-29.60)	(-82.52)	(-58.31)	(-75.33)	(-29.81)	(-74.92)	(-49.30)
Contig	0.481***	0.955***	0.478***	0.608***	0.446***	0.808***	0.446***	0.743***
	(5.81)	(4.90)	(5.76)	(5.24)	(5.77)	(4.38)	(5.75)	(6.84)
Col45	1.008***	1.249***	1.038***	0.858***	0.956***	1.130***	0.977***	0.581***
	(10.96)	(4.16)	(11.20)	(4.42)	(11.56)	(3.97)	(11.74)	(4.28)
Comlang_off	0.793***	0.717***	0.785***	0.870***	0.831***	0.615***	0.825***	0.896***
	(20.10)	(8.21)	(19.92)	(15.74)	(21.73)	(7.54)	(21.54)	(17.44)
SumlnGDP	0.367***	0.891***	0.341***	0.302***	0.410***	0.906***	0.397***	0.423***
	(6.37)	(71.10)	(5.83)	(3.75)	(6.95)	(74.60)	(6.66)	(5.31)
Tariffs				-0.028				-0.051*
				(-1.27)				(-2.18)
Procomp_i		-0.330***				-0.759***		
		(-4.28)				(-9.70)		
Procomp_j		-0.296***				0.122		
		(-3.64)				(1.50)		
Procomp_ij_avg			-0.622***	-0.510*			-0.275	-0.030
			(-3.34)	(-1.73)			(-1.51)	(-1.15)
Procomp_ij_diff			-0.041***	-0.086***			-0.033**	-0.063***
			(-3.52)	(-4.91)			(-2.91)	(-3.91)
Number of obs.	21347	21347	21322	10359	22055	22055	22029	11156
R-squared	0.8278	n/a	0.8281	0.8052	0.8284	n/a	0.8286	0.8283

Notes: The list of the variables is given in Annex I. The constants, time and country fixed effects are not reported in the table. All regressions were run with robust standard errors under heteroskedastic conditions (when relevant). Values of t-statistics are in parentheses (z-values for the Hausman-Taylor regressions in column 2). Values marked (***), (**), and (*) are significant at the 0.1%, 1% and 5% levels, respectively.

An empirical verification of the link between pro-competitive reforms and higher trade flows

42.   Table 1 reports the main results of the econometric analysis. Both exports and imports have been used as dependent variables. Starting with exports, the first column presents the base model with country and year fixed effects to control for unobserved differences across years and countries. The results are in line with the gravity literature when the model is applied to a dataset with a large number of developing countries. Trade flows are negatively related to distance and positively related to GDP. In this base model,

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12 .   As the index synthesises various policies and to avoid endogeneity or collinearity issues with other variables, the model has been kept as simple as possible. Different methods have been used to deal with the potential endogeneity of the index and GDP, as well as the difficulty to estimate the index for each country in the presence of country fixed effects. In particular, we use a Hausman-Taylor regression and a two-step Heckman estimation (see Annex IV).

no barriers to trade have been accounted for, but there are fixed effects to take care of the heterogeneity of countries, that is the individual differences from one country to another which are not explained by the observed variables.

43.   In the second column is presented the same regression, including this time the index of pro-competitive reforms for the reporter country (the exporting country) and its bilateral partner (the importing country). Both indexes are negatively and significantly correlated with bilateral exports. This is an empirical verification of the hypothesis made above. Countries with a higher index (and therefore less competitive markets) export less than suggested by the gravity equation. It shows that uncompetitive markets (and not only trade barriers at the border) are detrimental to trade (and hence to the gains from trade). The results can be seen as a confirmation of what is sometimes referred to as the "Porter's hypothesis", namely that greater competition at home leads to better export competitiveness (Porter, 1990).

44.   In columns (3) and (4) two other regressions are found where the individual country indexes have been replaced by the average index between a reporter and its partner and by the difference in their index[13]. The coefficient of the average index is negative and significant. Not only a country with a higher index will tend to export less, but its exports will be even more diminished if its partner has also markets less competitive. There is an additive effect. Moreover, the difference in the index is also significant and negatively correlated with exports. It means that countries with a similar degree of competition will trade more together. Not only two countries with a low index and hence very competitive markets will trade more but also two countries with a high index will tend to trade more (that is, if the partner country has also less competitive markets)[14].

45.   As far as imports are concerned (second part of Table 1), a noticeable difference is that the index from the reporting (importing) country is much more significant than the index of the partner country (which is insignificant). What matters is how competitive is the importing country and not the country from which imports are sourced. It also explains the lower influence of the variables that combine the index of both countries in the second series of regressions (Column 3). The average index is not statistically significant, but the difference between the index of the importer and the index of the exporter is significant and negatively correlated with imports. It is consistent with the result of regression (2) that shows that only the importing country's index has an impact on imports. More concretely, it means that uncompetitive policies act as barriers to imports, especially from the most competitive countries. The regression results suggest that trade flows between developed and developing countries are more affected by the uncompetitive markets of developing economies. It is between these two groups of countries that the difference in the index score is the highest and very significantly correlated to a negative impact on trade. It should be kept in mind that imports of goods from the most competitive markets are generally the ones associated to technological spillovers and dynamic gains from trade. The loss for the developing economies can be even greater than suggested in Table 1 if one takes into account such dynamic effects.

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13 .   As this difference is a function of the size of the index, the variable is divided by the sum of the reporter's and partner's index to have an appropriate scale.

14 .   One possible explanation to this surprising result is that exporters facing heavy regulations at home are more likely to overcome similar barriers in the foreign market. Focussing on services, Kox and Nordås (2007) show that regulatory heterogeneity impedes entry into foreign markets while similar regulation is positively associated with trade. Moreover, exporters from countries with a high index score are likely to be in non-competitive sectors or in a dominant position. In that case, they are less sensitive to a lack of competition in the foreign economy, while being vulnerable to strong competition enforcement in countries with a low index score.

Box 1. Correlation or causality?

The results from Table 1 point out a statistically significant correlation between the index of pro-competitive reforms –that reflects the stance of a country toward outward-oriented trade, investment and competition policies- and actual trade flows. The relationship can be also considered as economically significant on the basis of the analysis provided in the introduction. There is however no empirical proof of a causal relationship when estimating a gravity equation. The gravity equation can be described as a regression of endogenous variables on other endogenous variables. The relationship between trade flows, GDP (mass) and trade barriers (resistance) is an endogenous relationship and it can be safe to say that causality runs both ways when analyzing the impact of policies on trade.

However, causality can be apprehended through the chronology of events. The fact that many emerging countries have undertaken reforms and then have increased their trade flows hints at a causal relationship going from pro-competitive reforms to increased trade. There is no robust empirical verification of this as Granger-causality tests and other quantitative techniques to assess the direction of causality would require longer time-series than those generally available. First attempts to empirically analyse the issue generally conclude that causality runs both ways (Cyrus, 2004).

Trade reforms or pro-competitive reforms?

46.   Since the index incorporates trade policy indicators and in particular a trade policy variable based on the average tariff, an explanation to the negative and significant correlation between the index and trade flows can seem normal (or mostly explained by trade barriers). We have also emphasized in the analysis of the results of the index that the trade component explains much of the variations. However, as can be seen from column 4 in Table 1, a regression of the average applied tariff rate in the same gravity framework does not lead to the same results. For exports, the average tariff rate is insignificant. It is quite logical since it is the exporter's tariff rate which is used. However, when the importing country's tariff rate is tested (Column 4 in the second part of the Table), the coefficient is negative and significant, but less than the index of pro-competitive reforms in Column 2. It highlights the different nature of the barrier and the fact that tariff barriers alone cannot explain the totality of the bilateral trade resistance term in the gravity equation.

47.   However, one can wonder if it is essentially the trade component of the index that explains the positive impact of pro-competitive reforms on trade flows. To answer this question, an additional regression is provided in Table 2 where the index has been replaced by its three sub-components: an index for trade policy, an index for investment policy and an index for competition policy.

Table 2. The impact of the three components of the index of pro-competitive reforms

Hausman-Taylor estimation	Dependent variable: Exports	Dependent variable: Imports
Distance	-1.120***	-1.150***
	(-28.50)	(-28.77)
Contig	0.964***	0.804***
	(4.90)	(4.30)
Col45	1.228***	1.124***
	(4.05)	(3.90)
Comlang_off	0.724***	0.606***
	(7.93)	(7.06)
SumlnGDP	0.910***	0.921***
	(70.15)	(73.26)
Trade_i	-0.148***	-0.233***
	(-3.72)	(-5.73)
Invest_i	-0.112**	-0.126**
	(-2.74)	(-3.04)
Comp_i	0.104	-0.200***
	(1.86)	(-3.56)
Trade_j	-0.149***	0.030
	(-3.49)	(0.68)
Invest_j	-0.033	-0.044
	(-0.78)	(-1.02)
Comp_j	-0.034	0.123*
	(-0.59)	(2.16)
Number of obs.	20745	21447

Notes : The list of the variables is given in Annex I. Z-values are in parentheses. Values marked (***), (**), and (*) are significant at the 0.1%, 1% and 5% levels, respectively.

48.   Focusing on the reporting country (the importer or the exporter), it is clear that the trade component of the index is highly significant. Trade barriers are detrimental to trade. However, there is also a significant negative relationship between the investment policy component of the index and trade flows. It implies that investment liberalisation has a positive impact on trade, both on exports and imports of goods, confirming the complementary relationship between trade and investment that is generally observed. While the competition policy stance of a country has no significant impact on its exports according to Table 2, it is however significant in the case of imports. Both the significance and the coefficient of the competition variable are high. From the point of view of the importing country, trade, investment and competition policies matter to increase trade. For the exporting country, trade and investment liberalisation have a positive impact on exports.

49.   Turning now to the case of the partner country, very few of the variables are significant. As could be expected, the trade policy of the partner country matters for exports. It is however not clear that trade policies of the country from which imports are sourced have an impact on imports (the variable is not significant). Investment policy from the partner country appears also to be non significant. An unexpected result is however to see a positive coefficient for the competition policy of the partner country in the case

of imports. It would suggest that less competitive markets in a partner country tend to be associated with higher imports from this country. This is not at odd with the case of market power for exporting firms but is surprising in a dataset with so many observations. Too much emphasis should not be put on this result as the significance of the coefficient is rather weak. As a general caveat, the decomposition of the index into several sub-components introduces also collinearity issues and one should remain cautious about the interpretation of the results.

A simulation of the impact of pro-competitive reforms on exports and imports from developing countries

50.   Based on the results from Column 2 in Table 1, the elasticities of imports and exports with respect to a decrease in the index of pro-competitive reforms are the following: a decrease of 1% of the index score for the exporting country increases exports by 0.33%, while a decrease of 1% of the index score for the importing country increases imports by 0.76%. In addition, a decrease of 1% of the index score of the partner country is also likely to increase exports to this country by 0.30%[15]. It is possible to use these elasticities to evaluate the potential impact of pro-competitive reforms. Table 3 simulates the impact on 2004 trade flows of a decrease in the index of developing countries that would bring them to the value observed on average in high income OECD countries (0.300). In this simulation, all other variables are kept unchanged and the index is changed only if it was above the high income OECD average. It is of course a rough estimation of the changes that can be expected in trade flows, not based on a general equilibrium analysis and not consistent with a global trade balance. It gives an idea of the magnitude of the impact of pro-competitive reforms on trade flows.

51.   As can be seen in Table 3, the impact of pro-competitive reforms on trade flows is quite high when the coefficients from Table 1 are translated into percent increases for exports and imports. These results are in line with those calculated for OECD countries[16] if one takes into account the higher level of trade, investment and competition barriers in developing countries. There are substantial gains in promoting pro-competitive reforms, which are shown here as increased exports and imports but also lead to higher levels of GDP per capita (see section 4).

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15 .   It is interesting to note that the overall increase in exports comes close to the overall increase in imports when we add the +0.33% and +0.30% effects on exports. Although there is no constraint in the model to have balanced trade (the import and export regressions are run separately), there is some consistency in the results. However, the impact of more competitive markets on imports can be completely attributed to reforms in the importing economy, while the increase in exports is the result of an improvement in pro-competitive reforms in both the exporting and importing economies.

16 .   See Table A2 in OECD (2005). Reducing tariffs, easing FDI restrictions and diminishing domestic regulation to best practices levels (starting from a lower level of barriers than developing countries) is found to increase exports by 23.6% on average in OECD countries.

Table 3. Simulation of the potential impact of pro-competitive reforms on exports and imports from developing countries (2004)

Country	% change in exports of goods	% change in imports of goods	Country	% change in exports of goods	% change in imports of goods
Algeria	23.3%	41.7%	Madagascar	22.1%	38.6%
Argentina	23.9%	34.0%	Malaysia	18.5%	32.9%
Bangladesh	20.8%	43.2%	Mauritius	19.7%	36.8%
Belarus	25.4%	46.2%	Mexico	11.3%	24.7%
Bolivia	25.0%	32.1%	Morocco	21.4%	34.9%
Brazil	24.7%	43.0%	Pakistan	20.7%	38.1%
Cameroon	24.4%	42.9%	Paraguay	27.0%	39.2%
Chile	12.2%	12.7%	Peru	19.4%	30.8%
China	21.5%	42.2%	Philippines	18.2%	32.8%
Colombia	20.3%	35.7%	Senegal	25.4%	34.9%
Costa Rica	16.0%	31.0%	South Africa	15.3%	24.4%
Croatia	23.3%	40.3%	Sri Lanka	17.0%	32.3%
Egypt	25.4%	42.2%	Tanzania	28.9%	45.3%
Georgia	26.4%	42.1%	Tunisia	23.4%	38.6%
Ghana	21.4%	43.0%	Turkey	17.6%	31.1%
India	23.9%	42.3%	Uganda	24.2%	42.8%
Indonesia	23.0%	40.0%	Uruguay	15.5%	18.1%
Jordan	21.4%	36.3%	Venezuela	26.5%	49.1%
Kenya	28.0%	42.0%	Zambia	25.7%	42.3%
Korea	15.4%	19.5%	Zimbabwe	30.5%	52.4%
Macedonia	20.9%	37.4%	*Average*	*29.7%*	*36.0%*

Notes : The total impact on exports and imports, expressed as a percentage change, is the summation of the increase in exports across all trading partners, using the panel data of the gravity model and the estimated elasiticies of imports and exports from Table 1 (variables procomp_i and procomp_j). The assumption is that all developing countries in the Table reach the average index score observed for high income OECD economies (0.300).

4. The impact of pro-competitive reforms on income per capita through increased trade flows

52.   The index of pro-competitive reforms is negatively correlated to the level of income per capita, as illustrated by Figure 7. It shows that trade, investment and competition policies that are not outward-oriented and promoting competition are associated with low levels of GDP per capita. It suggests a relationship between the evolution of the index and the growth of income per capita. For example, Bolaky and Freund (2005) have pointed out that the impact of trade on growth is absent in heavy regulated economies.

53.   To test the relationship between trade, the index of pro-competitive reforms and GDP per capita, the econometric analysis from Section 3 can be extended by adding a growth equation. The approach is close from the one first proposed by Frankel and Romer (1999) and Frankel and Rose (2002). Annex IV includes the details on the growth equation. It takes the form of the one suggested by Mankiw, Romer and Weil (1992) with GDP per capita as the dependent variable (measured in real PPP adjusted dollars) and the following independent variables: the investment share of GDP, human capital, the rate of growth of population, and trade openness (measured as the ratio of imports plus exports to GDP). The reason why a trade openness ratio is introduced is that we are interested in the impact of trade flows on growth and that we want to use this variable to assess the impact of pro-competitive reforms on income per capita through

higher trade flows. The data come from the Penn World Table Version 6.2 (2006) and from UNESCO for human capital (proxied by school life expectancy). Panel data are used over the period 2000-2004[17].

Figure 7. Index of pro-competitive reforms and log of GNI per capita (2004)
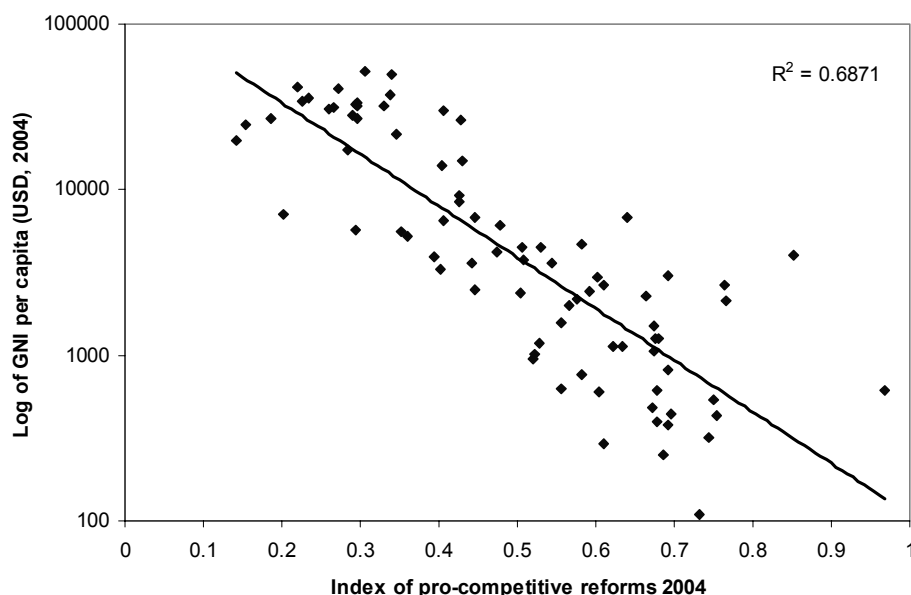
Source : WDI and OECD.

54.   The results of the growth regression are reported in Table A11 in the Annex. With fixed effects and both physical and human capital, GDP per capita is very well explained by the independent variables and a significant coefficient is obtained for trade openness. This coefficient is in line with the ones generally measured in the literature (see Nordas et al., 2006). A 1 percentage point increase in the trade to GDP ratio increases the income level by 0.33%. This elasticity can be used to estimate the gains from pro-competitive reforms in developing countries in terms of increased income through increased trade.

55.   Table 4 reports the results from this simulation exercise. Like in Table 3, the assumption is that developing countries attain the level of trade and investment liberalisation and regulatory reforms that is observed on average in high income OECD countries (a pro-competitive reforms index score of 0.300). Table 3 provides the increase in trade flows that can be expected from such a move towards more competitive markets. It is possible to calculate a new trade openness ratio that is then reintroduced in the growth equation that we have estimated to measure the increase in income per capita. Again, this is only an estimation where all other variables have been kept unchanged in order to understand the magnitude of the gains implied by the econometric analysis.

56.   Depending on how far a country is from the high income OECD country average, the gains from pro-competitive reforms range from an increase of 3.5% in income per capita in Chile to 10.5% in Venezuela. They are fairly large and more important than the ones estimated for OECD countries (see OECD, 2005). The average gain in the dataset is 7.7%. Gains from trade liberalisation, as measured in general equilibrium models, are often much smaller. One can discuss methodology issues, but the reason

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17 .   Due to data availability, the period covered starts one year before the gravity dataset and ends in 2004.

why gains are higher in the analysis provided here is to some extent because not only trade reforms are taken into account but also investment and competition reforms.

Table 4. Potential GDP per capita gains from pro-competitive reforms in developing countries

Country	% increase in GDP per capita	Country	% increase in GDP per capita
Algeria	7.7%	Malaysia	6.6%
Argentina	7.6%	Mauritius	7.7%
Bangladesh	8.6%	Mexico	4.9%
Belarus	8.7%	Morocco	7.7%
Bolivia	7.4%	Pakistan	7.7%
Brazil	8.3%	Panama	4.0%
Cameroon	8.8%	Paraguay	9.0%
Chile	3.5%	Peru	6.6%
China	7.9%	Philippines	6.8%
Colombia	7.4%	Senegal	8.5%
Costa Rica	6.6%	South Africa	5.5%
Croatia	9.0%	Sri Lanka	6.8%
Egypt	9.2%	Tanzania	10.2%
Georgia	9.8%	Tunisia	8.2%
India	7.7%	Turkey	6.8%
Indonesia	8.4%	Uganda	9.7%
Jordan	8.3%	Uruguay	4.6%
Kenya	9.3%	Venezuela	10.5%
Korea	4.7%	Zambia	9.0%
Macedonia	8.2%	Zimbabwe	10.4%
Madagascar	8.6%	***Average***	***7.7%***

Notes: The assumption in this simulation is that all developing countries have increased their trade in the proportion estimated in Table 3 (corresponding to an index of pro-competitive reforms equal to the high income OECD countries' average). A new trade openness ratio is predicted and reintroduced in the growth equation. The fitted values with this new trade openness are compared to the values coming from the dataset to measure the potential increase in GDP per capita.

57.   There is a linear relationship between the index score, increased trade flows and higher levels of income per capita. While the scenario presented in Table 4 assumes that developing countries align themselves on the OECD high income countries average, gains could be smaller (but still important) if these countries meet only partially the OECD average or even higher if their reforms go beyond (and if they reach the index of countries like Estonia, Hong Kong, New Zealand or Singapore which have the lowest index scores). It should be also noted that only the impact of increased trade flows on income per capita has been measured. There are other channels of transmission between trade and growth, through factors of production and dynamic productivity gains (see Nordas et al., 2006). The gains from Table 4 would be higher if these effects could be measured as in the growth regression there are likely to be picked up by the factors of production variables. To be complete, the analysis should also cover potential costs related to the implementation of pro-competitive reforms. It would be then possible to provide a "net" gain on income.

58.   Lastly, there is often a concern that pro-competitive policies can lead to a higher level of inequality and tend to give priority to economic and productivity growth to the detriment of other dimensions of human development, such as health or education. Box 2 shows that it is not the case.

Box 2. The relationship between pro-competitive reforms, human development and income inequality

As illustrated by Figure 8, the index of pro-competitive reforms is also well correlated with the Human Development Index from UNDP. In addition to GDP per capita, this index includes data on life expectancy and education. The correlation does not automatically imply that there is a causal relationship between pro-competitive reforms and human development, but at least it is clear that the most competitive countries are also the ones with the highest levels of human development.

Figure 8. Index of pro-competitive reforms and human development (2004)

$R^2 = 0.566$
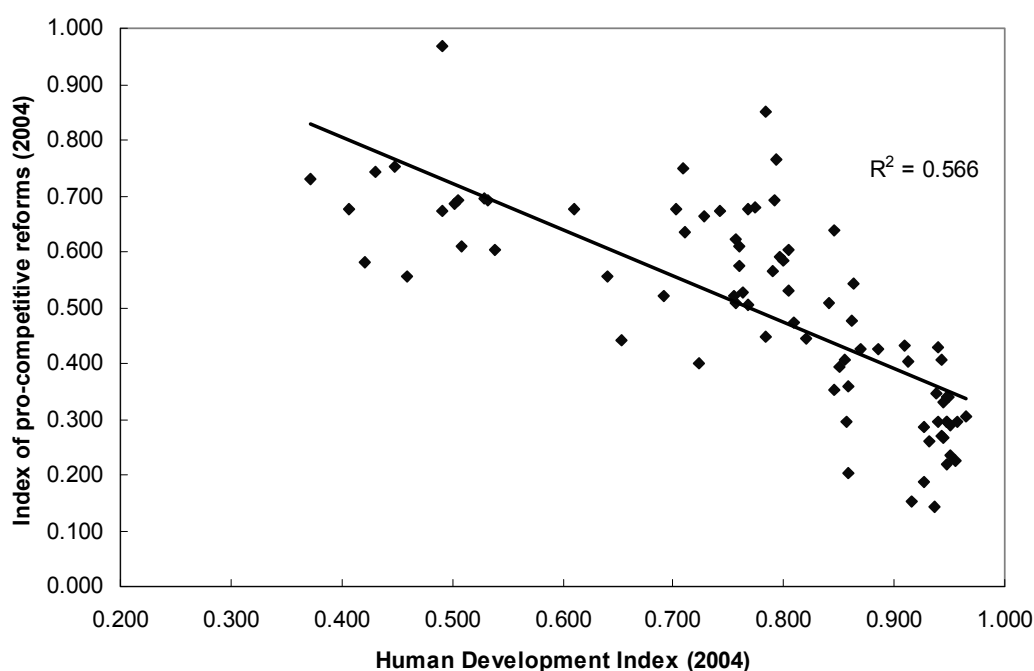
Source : Human Development Report (2006) and OECD.

Regarding inequality, Figure 9 presents evidence on the *absence* of relationship between pro-competitive reforms and the dispersion of income within countries, as measured by the Gini coefficient. The Gini coefficient is a measure of the dispersion of income that compares the actual distribution of income (the Lorenz curve) to a perfect distribution. Values obtained are between 0 and 1, with 0 corresponding to perfect income equality and 1 to perfect inequality.

The trend line suggests a positive relationship where countries with higher barriers to trade, investment and competition have higher levels of inequalities but there is no statistical significance in this relationship. The relationship between inequality and growth usually takes the form of an inverted U-shaped curve -the Kuznets curve- (see Banerjee and Duflo, 2000; Bourguignon, 2004). Looking at Figure 9, it is hard to see such a relationship in the case of pro-competitive reforms and inequality of income. There are a certain number of countries with a high index score but still a fairly equal distribution of income while for the same level of the index other countries show high inequalities.

It points out that income equality is related to other policies than the ones described in this paper. Pro-competitive reforms can have an impact on poverty reduction (as seen above) but the relationship with inequality reduction is not straightforward. It can nonetheless be stressed that in any case there is no relationship either between pro-competitive reforms and an *increase* in the level of inequality.

Figure 9. Index of pro-competitive reforms (2004) and income distribution
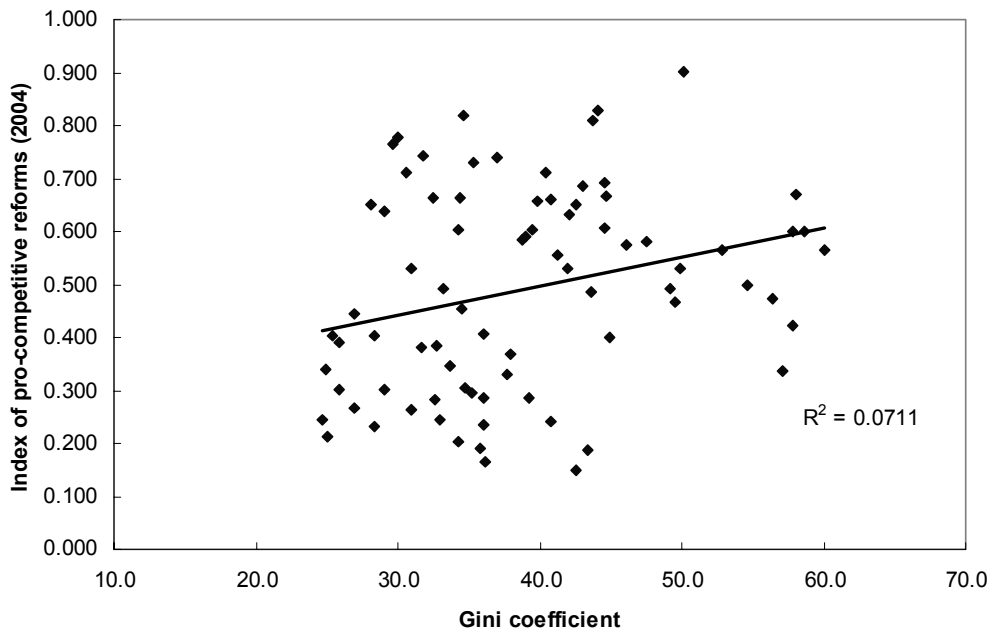
Source : Human development report (2006) and OECD. Latest year available for the Gini coefficient.

**PART II. PRO-COMPETITIVE REFORMS IN KEY SERVICES SECTORS AND THE
EXPERIENCE OF THE WTO TELECOMS REFERENCE PAPER**

59.   As highlighted in the introduction, liberalising trade is already promoting competition because of
the entry of more competitive foreign products and services in domestic markets. Liberalising investment,
which is often done concomitantly in a trade agreement – especially in the case of services trade that
includes Mode 3 – has an even more pronounced impact on competition as foreign companies directly
enter into competition with domestic companies. So liberalisation not only affects product markets, but
also factors and input markets that use the best resources available in the domestic economy.

60.   However, the question remains whether trade agreements should also include disciplines that go
beyond trade and investment liberalisation, which is the primary focus of such agreements. Trade
agreements have been found in recent years to incorporate more and more disciplines on competition law
and policy[18], investment protection and non-discrimination (in addition to market access), and regulatory
reforms. These provisions are related to trade liberalisation because they deal with potential barriers to
trade constituted by "beyond-the-border" regulations or anti-competitive practices. At the same time, these
provisions touch upon issues which are purely domestic and not entirely related to trade liberalisation
defined in a narrow sense. These provisions represent a type of economic co-operation that goes beyond
the promotion of free trade, and which often aims at helping countries to promote pro-competitive and pro-
growth policies, in a trade agreement which covers more issues and is often called an "economic
partnership" or "co-operation" agreement.

61.   The 1996 Telecommunications Reference Paper (RP) represents a milestone example of the
inclusion of pro-competitive policies on a multilateral basis. This short document, while voluntary,
introduces common regulatory principles as additional GATS commitments for one specific sector. This
section analyses the structure of the RP, considers the implementation of its regulation into national
legislation, especially in developing countries, and tries to assess the extent to which the RP has been a
driver of reform. In addition, the paper gauges the extent to which the RP could set an example for other
sectors to limit anti-competitive practices of dominant incumbents.

1. An overview of the WTO Telecommunications Reference Paper

a) The negotiations on trade in telecommunications services

62.   In 1994, the Annex on Telecommunications of the General Agreement of Trade in Services
(GATS) established a general framework for access to and use of certain telecommunications services by
providers of any service who need telecommunications to supply their services. The annex related to
access to and use of public basic telecommunications for service suppliers from participating countries,
rather than to market access. As a result the access and use obligations applied to all WTO Members
whether or not their markets were open to competition. In fact, no more than a handful of markets were
open at the time the Annex was negotiated. Post-Uruguay Round negotiations produced the Fourth

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18 .   See COM/DAF/TD(2005)3/FINAL regarding the inclusion of competition provisions in regional trade
           agreements and TD/TC/WP(2005)40/FINAL for investment provisions.

Protocol of the GATS, which provides schedules of commitments in telecommunications, many of which committed to the introduction of competitive markets in the telecommunications sector for the first time.

63.   The schedules attached to the Protocol indicate the extent of market access granted and national treatment guarantees (or limitations thereon) for foreign telecommunication suppliers. The Reference Paper (RP), attached to many of the schedules, specifies regulatory principles on competitive safeguards, interconnection, independent regulation, transparent licensing procedures and non-discrimination. An overview of the disciplines included in the RP is provided in Box 3. Whether or not to attach the Reference Paper was a voluntary decision of negotiators. However, once attached to a schedule the RP becomes a legally binding obligation to set up a regulatory environment conducive to market entry in the telecommunications sector. Out of the 142 countries that have scheduled GATS commitments, 105 made some type of commitment in telecommunication services. Out of those 105 countries, 83 incorporated at least some portion of the RP in their schedules (see Annex V).

64.   The principles included in the RP supply a template of best regulatory practices. The discretion left to national authorities in the implementation has produced mixed results. Some governments have used the RP to lock-in policy reforms and accelerate intended future reform of the telecommunications sectors. However, other countries that might have not fully adhered to the RP's guidelines in practice, are becoming aware of the expectations associated with good governance of the sector beyond what is stated in the letter of the law of binding agreements.

Box 3. The disciplines of the Reference Paper

The Reference Paper provides a multilateral approach to extending trade rules to private anti-competitive practices through sector-specific regulation. This brief document provides six general principles for the regulation of basic telecommunications services. The translation of these general rules into national legislation is left to the individual countries, which commit to:

- Establishing appropriate general competitive safeguards to restrain major suppliers from engaging in anticompetitive practices, including, in particular, cross-subsidisation, the use of information obtained from competitors, and the withholding of technical information;

- Ensuring interconnection between different suppliers at any technically feasible point in the network in a transparent, non-discriminatory, timely, and cost-based manner;

- Designing domestic regulations for universal service obligations that are transparent, non-discriminatory and competitively neutral;

- Publishing criteria and conditions for individual licenses in advance and providing reasons for the denial of licenses;

- Setting up an independent regulatory authority separate from the major supplier and all other market participants;

- Allocating scarce resources, including frequencies, numbers and rights of way, in a timely, transparent and non-discriminatory manner.

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65.   The main goal of the RP is to restrict the possible adverse effect of the dominant position of major telecommunications service suppliers on market access commitments undertaken. Telecommunications were for a long time considered a natural monopoly because of the high fixed costs required to build network facilities. The introduction of competitive carriers gives the incumbent operator

an incentive to leverage its control over essential facilities. The incumbent's ability to dominate access to bottleneck facilities has hampered competition and market entry.

66.   The RP provides the very general provision that a 'major supplier' controls 'essential facilities' or exercises market power. Typically, the substitution of essential facilities is not feasible due to economic or technical reasons. Depending on the general competition legislation, national telecommunications laws vary in their definitions of the terms 'major supplier' and 'essential facilities'. For instance, Hong Kong specifies the conditions that define essential facilities and major suppliers. Singapore grants different licenses depending on the status of the facilities, as defined by an independent regulation authority. Mexico's regulatory authority used to assign the major supplier its market share, power to control prices and the possibility to prevent entry before it reached an agreement with the US on dropping the regulation[19]. South Korea imposes obligations to provide network facilities, interconnection and information on suppliers with excess revenues and a 50 percent market share (Latiff, 2005).

67.   The following section assesses the economic rationale behind each regulatory discipline included in the RP, illustrating specific implementation examples followed by more comprehensive case studies of developing countries.

b) Competition and telecommunication services trade

68.   Rapid technological change and increasing global linkages were driving developments in telecommunications during the last decade. Countries that committed to the RP experienced on average stronger increases in international telecommunications traffic and a sharper decline in prices for international calls than countries that did not. The OECD work on trade and structural adjustment showed that market structure for fixed and mobile networks in the OECD area improved through the liberalisation process started in the 1990s. It then accelerated during the implementation of the RP to achieve nowadays a more competitive environment (OECD, 2006).

69.   The relationship between competition and the value of trade in communications services is complex. Increased competition is expected to foster the efficiency and quality of services and reduce both accounting rates and sale prices to the end user. As a result, looking for example at one market segment and mode of supply, cross-border international traffic, the volume of outgoing and incoming minutes increases, but not enough to offset the reductions in accounting rates and prices. This serves to illustrate the magnitude of monopoly rents that exclusive operators had been exacting in the international service segment of the market. Accounting rates settlements, which balance of payments (BOP) figures largely reflect, often exceeded costs of international calls by many multiples. Increasing the use of IP networks to deliver international services reduces the cost, and hence prices of service, even further.

70.   Figure 10 depicts the average value of trade in communication services (BOP flows) for all the countries that committed, developing countries that committed, and countries that did not commit to the RP from 1994 to 2003. Figure 11 shows the development of average prices of phone calls to the United States (three minutes) for the same groups of countries. In addition, Figure 12 illustrates the average volume of outgoing and incoming traffic in minutes from 1994 to 2003.

71.   The average value of communications trade for RP-committing WTO members was relatively constant over time, whereas average international traffic grew strongly. Countries that committed to the RP experienced an increase in the value of trade since 2002. Prices for international calls declined strongly

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19 .   The agreement came after the WTO dispute settlement panel ruled in favour of the US on the '*Mexico – Measures affecting Telecommunication Services*' case. This was the first WTO services antitrust-related ruling.

since the introduction of the RP and international traffic nearly doubled. Developing countries that committed to the RP had a constant value of trade in communications services over the last decade despite increasing international traffic. Yet, citizens of these countries have experienced a significant reduction in the price of telecommunications services from pre-RP levels. Finally, countries that did not commit to the RP did not experience a significant change in the average value of communications trade until recently. Over time, prices declined and the volume of traffic increased. However, their volume of international traffic increased at a lower pace than in countries that adopted the RP and prices for international calls in the non-committing countries remain considerably higher.

Figure 10.   Average value of total communication services trade (1994-2003)
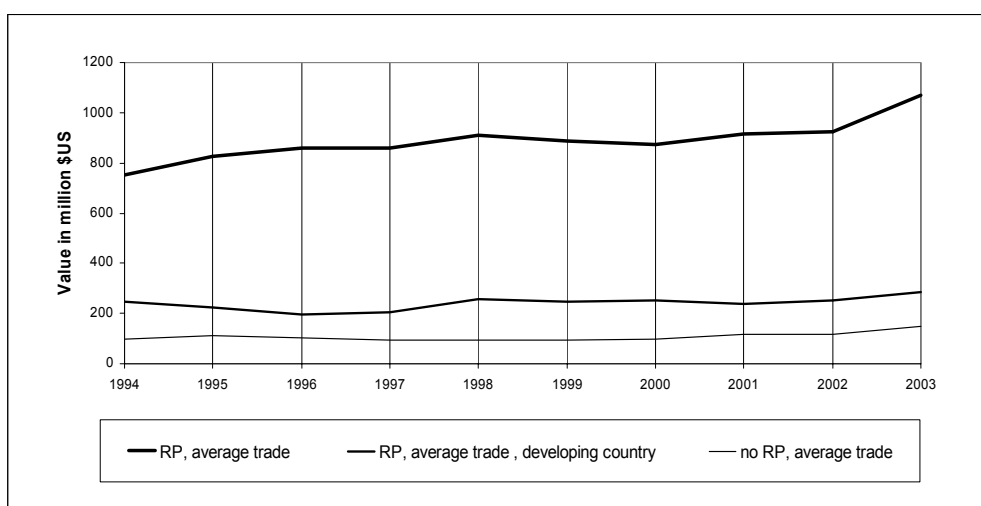
Source: OECD Secretariat, based on UNCTAD data. Communication services include postal, courier, and telecommunications services. BOP figures presented here may be somewhat downward-biased as compared to the actual value of international trade in telecoms services.

Figure 11.   Average prices of international phone calls to the US (1996-2003)
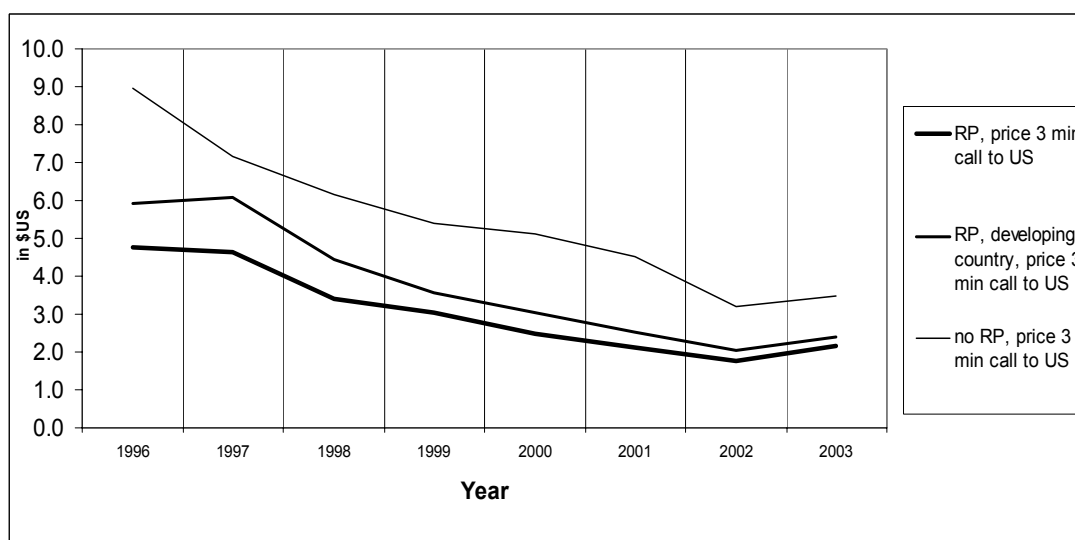
Source: OECD Secretariat, based on data from Estache and Goicoechea (2005).

Figure 12. Average volume of incoming and outgoing calls in minutes (1994-2003)
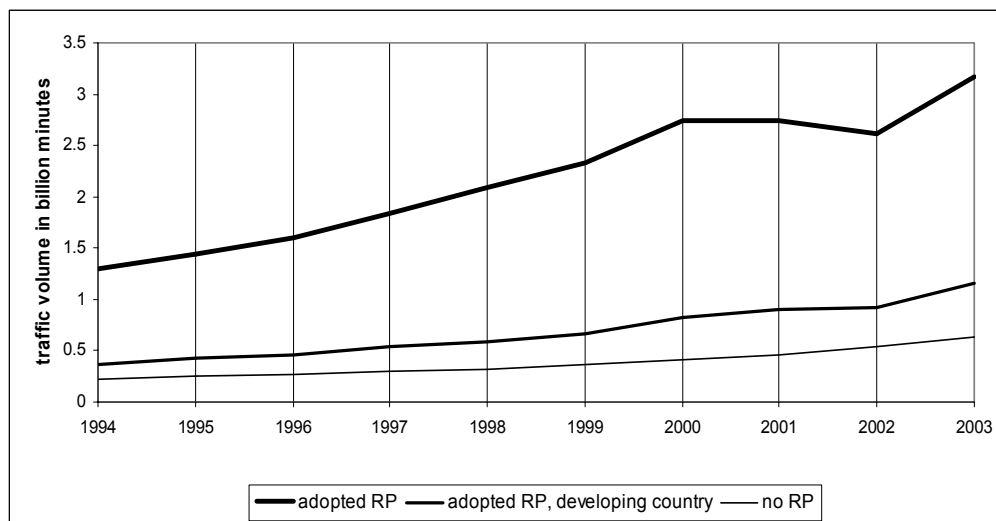
Source: OECD Secretariat, based on data from Estache and Goicoechea (2005).

2. The six disciplines of the reference paper

a) Competitive Safeguards

72.   Examples of anticompetitive behaviour that are specifically mentioned in the RP include cross-subsidisation, misuse of competitors' information and the witholding of technical information by the major supplier. The implementation of appropriate rules is left to the single country, which has to develop its own mechanisms to prevent cross-subsidisation and the abuse of asymmetrical information.

73.   For monopolistic network regimes, a common policy is to allow or require the operator to cross-subsidise cheap local services with overpriced international calls. Economic studies show that an inefficient pricing system has negative effects on telecommunication services and the provision of universal service (Kasermann and Mayo, 1994). In addition, cross-subsidisation prevents effective competition and entry into the local market. The separation of business units and accounts is often used to control anti-competitive cross-subsidisation, as financial flows become more transparent. In addition, the sharing of marketing and sales resources allows the major supplier to enhance sales of its non-competitive services. Bundling mobile and fixed line services allows the incumbent to prevent competition in individual market segments.

74.   Many RP signing countries implemented measures against cross-subsidisation paired with the demand to separate accounts. Some national regulations also address anti-competitive bundling practices (*e.g.*, Hong Kong and Singapore). Furthermore, the Federal Competition Commission (CFC) of Mexico intervened against anti-competitive practices of the major supplier on the basis of regulations that were established with regard to the RP. Teléfonos de México (Telmex) was fined for bundling and refusal to deal in the long distance market in 1999. On the resale market, the CFC imposed sanctions for undue charges, discriminatory practices and the bundling of interconnection rates (OECD, 2002).

75.   Moreover, the indirect access to competitors' information can constitute a strong anti-competitive practice. For example, the provision of interconnection services allows the major supplier to obtain information about the competitor's strategy, peak usage, equipment types, network architecture and efficiency. This information can be very valuable for its own pricing strategies. To prevent the abuse of

competitors' information, an appropriate measure is the separation of carrier and resale units. In addition, the regulation authority could impose strong measures to protect information. National laws have implemented the misuse of information clause in different ways. For example, Peru's legislation sees abuse of information as a 'major offence'. Chinese Taipei insists on the separation of accounts and protects vital information[20] (APEC, 2005).

76.   The RP addresses not only the misuse but also the withholding of information. Major suppliers can have a technical advantage if they conceal the use of new equipment until its introduction. A longer preparation period provides time to better develop services and upgrade the quality of the network in comparison to uninformed competitors. The obligation to make technical changes publicly available on a timely basis helps prevent such actions. For example, Singapore's competition authority intervened when StarHub failed to report call failures to SingTel, which had unilaterally introduced a solution for rooting calls between both networks. Although the authority gave only a formal warning, the case displays the awareness and reactivity of the authorities, which identified the potential advantage in network quality for StarHub during the period in which SingTel could not localise the source of error in its new technology[21].

b) Interconnection

77.   This is the most detailed element of the RP as a proper interconnection policy is key to the promotion of competition and entry into the telecommunications industry. In particular, the RP focuses on regulatory elements that promote interconnection between the new service provider's network and the one of the incumbent. In the case of the deregulation of monopolies, this issue tends to rise in importance as the new provider does not always have the technical and financial capability to build an extensive network overnight, hence must rely of extensive and costly interconnection with the former monopoly to terminate calls from its own customers to the vast majority of customers who remain with the monopoly operator.

78.   Key prescriptions of the RP point toward the provision of guarantees for the interconnection of major suppliers under non-discriminatory conditions, especially referring to rates and quality of the interconnection as offering lower quality interconnection, albeit at reduced rates, can have the same anticompetitive effect as high interconnection prices). Importance is therefore given to the commercial and financial terms of the interconnection, as pricing can become a significant tool to spoil pro-competitive efforts. The RP addresses the issue by advocating the application of cost-oriented rates (transparent and reasonable), as well as timely interconnection service provision and the application of unbundled access to desired interconnection points to lower economic and technical barriers to competitive entry.

79.   The implementation of the interconnection principle needs the strong presence of regulatory authorities and dispute settlement mechanisms[22]. Peru, for example, adopted this part of the RP by focusing on three main aspects: a) the establishment of interconnection charges limited by default, b) the determination of interconnection points and c) the control of access of new operators to essential facilities.

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20 .   For a complete outline of the Chinese Taipei's practice on dealing with cross-subsidisation, please refer to DAF/COMP/GF/WD (2005)19.

21 .   IDA Singapore, Case Nr. REG/INTC/008.

22 .   Interconnection was at the heart of the hitherto first WTO dispute settlement case based on the RP between Mexico and the United States, which led to the renegotiation of international settlement rates. Wellenius *et al.* (2005) underpin the implications of the ruling well-beyond the telecommunications sector for other network industries. The Dispute Settlement Body noted that cross-border market access commitments under the GATS apply, irrespective of the presence of the service provider in both countries, when a service is contracted in one country and delivered to another. In any case, the decision showed the enforceability of the general competitive safeguards of the RP, giving credibility and a push to lock in reforms when a country commits to adopting a principles-based RP.

The latter in particular aimed at disaggregating the network into essential facilities, hence favouring unbundling of network and service provision (Romero, 2003).

c) Universal Service

80.   The RP recognizes the legitimacy and importance of universal service obligations, but requires that these be carried out in a way that is transparent, non-discriminatory and competitively neutral procedures. Universal service policies aim at the provision of access to affordable telecommunications, particularly for those citizens competitive markets would not service[23]. State-run telecoms monopolies traditionally used cross-subsidies to fulfil universal service obligations. New entrants were typically associated with cherry-picking practices that focused on wealthier customers, because reaching disadvantaged social groups in rural or urban areas usually implies high access costs and limited revenue potential. At the policy level, this principle can be shaped in the way Latin American countries did during their telecoms privatisation process. Their practice was to grant limited monopoly licenses bound to universal service obligations in order to build up network facilities in remote areas (Tigre, 2000)[24].

81.   However, universal services requirements are not necessarily conducive to more competitive markets[25]. Competition-driven mechanisms, such as universal service obligation funds (USO Funds), can be a very effective way to expand networks into remote areas when market conditions are in place. For example, Chile and Peru's USO Funds, which were financed through the government budget or mandatory obligations of all providers[26], determine maximum project subsidies for which telecommunications suppliers can bid. The project licence would go to the company that can provide network access with the lowest subsidy.

82.   In contrast to pure universal service obligations, Chile's USO Fund sets a positive example for closing the gap between the fragile capital basis of new entrants and high upfront investments in networks. Wellenius (1997; 2000) argues that the USO Fund increased competition through the market entry of companies, which provided services at lower cost than the incumbent. In addition, the fund raised the attention of operators on new investment opportunities, which was reflected by many zero-subsidy bids. In 1996, the fund could achieve 90% of its projects with only 48% of the planned budget, which gives the government an efficient tool to improve rural infrastructure at low cost. It is important, however, to highlight that USO Funds only work sufficiently in a competitive environment. In regions where the incumbent operator, Telecommunicaciones de Chile, did not face competition, it bid the price up to the maximum subsidy available (Wellenius, 2000). Therefore, mandatory service obligations may be preferable in non-competitive markets.

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23 .   Universal service issues in telecommunications are analysed in OECD and World Bank (2006).

24 .   Serving rural and remote areas of developing countries has become less challenging thanks to new technologies. WiMax, WiFi and VOIP, are among advanced technological tools available to increase access at an affordable price. However, policies limiting new entrants in the sector might hinder the capacity of using new technologies for universal service.

25 .   For example, the limited monopoly licences have been criticised for not having a positive effect on subscription levels and introducing distortions in the market. See the Argentina case study in OECD (2006a).

26 .   Peru asks every operator to contribute 1 percent of operating profit to the Telecommunications Fund (FITEL), while in Chile the government initially contributed US$ 4.3 million of its budget to the fund (Wellenius 1997, 2005).

d) Independent Regulatory Authority

83.   Disciplines on independent regulation were included in the RP to provide for objective, impartial and hence credible policy reforms and compliance of all market participants with competition rules. The creation of an effective independent regulator requires adequate expertise, sufficient funding, information, authority and accountability. New entrants pay particular attention to transparency, non-discriminatory principles and adequate licence fees. Thus, the establishment of bodies that are clearly separated from all market participants is crucial to encourage market entry (ITU, 2002, p. 7).

84.   Independent regulation positively affects the behaviour of investors, suppliers and consumers. Wallsten (2002) shows that the establishment of independent regulators prior to privatisation increases investments in telecommunications, the number of fixed telephone lines and cellular penetration. In addition, investors attach higher value to firms that operate in an independently regulated environment. This is in line with the assumption that investors require a risk premium if regulatory competencies remain ambiguous. Most countries split the regulatory competence for telecommunications services into policy-setting, technical regulation and competition supervision bodies. With the implementation of the RP, the number of independent regulators jumped from 43 in 1995 to 86 in the aftermath of the introduction of the RP in 1998. Today, 140 countries possess independent telecommunications regulation authorities. In particular, Latin American (91%) and African (86%) nations established a separate authority, while Asia-Pacific (56%) and the Middle East (57%) are behind with the establishment of independent supervisors (ITU, 2006, p.17f).[27]

85.   The establishment of regulators can result in different institutional arrangements. Mexico, for example, established two independent authorities for the regulation of the telecommunications sector in 1996. The Federal Telecommunications Commission (Cofetel) is responsible for the technical, economic and social regulation, while the Federal Competition Commission (CFC) oversees anti-competitive practices and mergers (OECD, 2002).

86.   Annex VI indicates which countries adopted independent regulatory authorities and provides some evidence of the relevance of the RP in stimulating regulatory reform. The table compares WTO commitments with the status of the reform process in 2004. In a first wave of regulatory reform during the early 1990s, Latin American countries in particular privatised their incumbent operators and established independent regulators in parallel to post-GATS negotiations, and they eventually locked-in their reforms with their commitment to the RP. The formal adoption of the RP in 1996 led to a second wave of legal reform in telecommunications services. Today, most countries that committed to the RP fully implemented competitive disciplines and established independent regulators. Even some non-committing countries have moved forward recently to put in place the necessary institutions for the good governance in the sector.

e) Licensing

87.   Licensing is one of the most commonly used regulatory tools around the world, which also carries the possibility of being utilised to create market entry barriers. Licenses can be administrative, can convey legal requirements and obligations (e.g. on universal service) and can be used to implement market access limitations such as limits on the number of suppliers. However, distorted usage of licenses or the licensing process can be accompanied by cumbersome procedures and expensive fee charges. The RP introduces a set of guiding principles, focusing on transparency in the licensing process. In particular, if a license is required, it is expected that the information on all licensing criteria and the period of time

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27   It is important, however, to notice that ITU data apply a slightly different standard to gauge independence that does the RP. The RP requires independence from telecom providers, where as the ITU data classify an operator as independent only when it is separate from the relevant ministries as well as providers.

normally required to reach a decision concerning an application for a licence are made public. By the same token, terms and conditions of individual licenses need to be publicly disclosed and applicants have the right to know the reasons for the eventual denial of a licence. In general, these provisions seem to be quite aligned with the GATS transparency disciplines on domestic regulation (Article IV).

88.   Implementation efforts for these provisions mostly focused on transparency issues. The National Telecommunications Commission (NTC) of the Philippines, for example, publicly disseminates licensing criteria. The NTC reviews applicants on the basis of their technical and financial capability for service provision. These applications undergo public hearing and economic testing to verify the demand for the service in a specific area (Latiff, 2005).

f) Allocation of Scarce Resources

89.   The increasing competitiveness of the telecom industry might create tension among players as the availability of key resources for service provision falls with the entry of new participants. Among the essential resources in the telecom industry there are frequencies, numbers and right of way. Negotiators drafted the RP in order to smooth the procedures with which these resources are being allocated by favouring objective, timely, transparent and non-discriminatory government measures. The allocation of frequency, also known as spectrum management, can represent a strong regulatory tool to protect markets, as it affects licence granting and market entrance. Numbering can also be a significant technical barrier as new entrants might be prevented from providing reliable connections to new or already existing customers[28]. Finally, rights of way are also important as infrastructure competition might impact significantly the financial and operational viability of a new entrant to the market[29].

90.   In the presence of different proposals for the allocation of scarce resources, the decision-making process is likely to yield more competitive outcomes if it is transparent, according to pre-established criteria for the award. Among the most commonly used techniques are lotteries, comparative evaluations and auctions. These are being employed more and more by countries around the world, many of which have adopted related measures following the acceptance of the RP. Peru, for example, implemented the use of competitive mechanism (competitive bidding or tenders) for designing the spectrum when the availability of frequencies limits the number of operators in a service (Romero, 2003).

91.   Trying to quantify the impact of the RP is not as straightforward as describing its provisions. Although some attempt at the empirical level have been pursed, quantitative effects remain difficult to clearly identify (Box 4). The timing of reforms, the current status of market competition and the year of establishment of independent regulation in Annex V show that, at the country-reform level, the RP has contributed to initiate reforms that were otherwise absent in the political agenda of some countries. It also helped to consolidate or advance reforms that were already being discussed at the country-level, but that needed international recognition to build increased domestic political support. The implementation of reforms carries a related economic impact, which can be measured by indicators of sector penetration, cost reductions and product development. The following case studies illustrate the importance of pro-competitive reforms in the telecommunications sector in developing countries, and the role of the RP in this regard.

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28 .   Another important issue as number portability is not mentioned in the RP.

29 .   In the telecommunication sector, rights of way includes the privilege to lay cables, wires, antenna over land and buildings that are not the property of the operator and to continue to use this right over a long period of time. (Guermazi, 2005, pg. 11)

Box 4. Empirical estimation of the impact of the WTO Telecoms Reference Paper

A recent WTO working paper examines the impact of telecommunications reform on sectoral performance and economic growth in Africa. The African continent, while suffering from high prices, seems to be approaching telecoms world average in terms of services penetration. The quality of regulation in terms of independence and competence of the regulatory authority is stimulating open competition, which leads to lower prices and improved service availability. The authors investigate whether GATS commitments at the sector level, like the Telecoms RP, are increasing this penetration and reducing prices. Their regression model shows that, contrary to unilateral liberalisation, multilateral efforts have no significant impact on performance in Africa. On the other hand, at the global level the adherence to the RP is associated with price reductions. The explanation given is that GATS commitments, especially in African countries, may be less ambitious than existing market conditions and that only real reform can lead to tangible benefits to consumers. It should be nevertheless noted the limits in the sample of the analysis as only six African countries have so far adopted the Telecoms RP in its entirety.

Source : Djiofack-Zabaze and Keck (2006)

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3. Three case studies on the implementation of the Reference Paper

a) The Caribbean - Dominican Republic[30]

92.   To Caribbean countries, WTO negotiations offered an opportunity to credibly commit to sector reform in basic telecommunications services. Until recently, Caribbean economies have been very dependent on agriculture (bananas, sugar, and coffee) and tourism. To diversify their industries, most Caribbean governments have been looking to develop information-based ICT industries. During the WTO negotiations in basic telecommunications, nine Caribbean countries adopted the RP in 1997 and seven countries made market opening commitments[31]. Except for Antigua & Barbuda, the nine countries that committed to the RP have established an independent regulator, enacted a new Telecom Act and liberalised market access. In addition, many Caribbean countries that did not commit to the RP also reviewed their legislations and established independent regulation authorities. However, the reform process has yet to be completed in some countries.

93.   The Dominican Republic serves as a case study to illustrate the legal and institutional reform process and its economic impact in the Caribbean. Telecommunication services had been provided by a private sector monopoly until 1992, when the Dominican Republic started to grant licences to other operators. To implement commitments taken under the RP, a new telecommunications law (Ley 153-98) was promulgated in 1998 replacing the old law from 1987. This law established an independent regulator, INDOTEL, to regulate anti-competitive behaviour, award licences, plan the use of scarce resources, regulate prices and tariffs and resolve disputes between operators and service providers as well as service providers and users. The de-monopolisation process in the Dominican Republic occurred before any agreement at the multilateral level, however, and the RP served as a stimulus to initiate institutional reforms as, for instance, the establishment of an independent regulatory authority.

94.   In addition, the Dominican Republic established a universal access fund in 1998 to which each subscriber of a public telecommunications service contributes 2% of his monthly bill. This fund is

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30 .   Based on Stern (2006).

31 .   Commitments to the RP have been made by: Antigua & Barbuda, Barbados, Belize, Dominica, Dominican Republic, Grenada, Jamaica, Suriname, and Trinidad & Tobago. Market opening commitments have been made by Antigua & Barbuda, Belize, Dominica, Dominican Republic, Grenada, Jamaica, and Trinidad & Tobago.

administered independently by INDOTEL, which awards 60% of the funds for development projects based on minimum subsidy auctions. Between 2000 and 2004, the universal access fund subsidised the installation of 500 public payphones in public centres, and the establishment of a tele-education portal, 9 tele-centres and telemedicine projects in 18 provinces.

95.   Since 1998, when the new telecommunications law was enacted, the telecom sector experienced annual growth rates of about 15% (25% in 2001). The share of telecommunications services of GNP increased from 4% in 1997 to more than 9% in 2004. Not only 72% of outgoing telephone calls are destined for the United States, but also incoming traffic mainly comes from the United States. Despite increasing levels of incoming traffic, net settlement payments for telephone traffic from the United States decreased by more than 50% between 1993 and 2003 (Stern, 2006), highlighting more competitive pricing policies and a decrease in settlement rates.

b) Sri Lanka[32]

96.   Sri Lanka started the liberalisation of telecommunications services in the early 1980s to improve the coverage of the network and foster economic development. The administrative separation of postal and telecommunications services within the ministry was followed by a stepwise introduction of competition – first in local fixed-lines in 1996 and later in international telecommunication services in 2002. In 1991, Sri Lanka enacted its first telecommunications act that established the Office of the Director General of Telecommunications as regulatory authority and converted the public telecommunications operator into a government-owned corporation.

97.   These initial reforms were supported by the adoption of the RP on regulatory principles in April 1997, which offered the opportunity to lock-in ongoing legal reforms of the sector undertaken at the time of the WTO negotiations. This was the case with the changes to the 1996 Telecommunications Act, which was integrated by the Sri Lanka Telecommunications (Amendment) Act No. 27, establishing the Telecommunications Regulatory Commission (TRCSL). The TRCSL began as an independent authority not accountable to any telecommunications provider and consisting of a five-member commission. The Chairman of the TRCSL is the Secretary of the Ministry of Posts and Telecommunications, and while this does not contradict with the plain language of the Reference Paper, questions over its independence from political influence were raised due to the government shareholding position in the incumbent Sri Lanka Telecom (SLT)[33]. Several disputes arose over the fairness of TRSCL and, in spite of efforts to make the independent regulator more transparent, uneasiness remains in the industry on political influence exercised upon the telecoms authority (Zita and Kapur, 20004)

98.   Privatisation started in 1997 when Sri Lanka divested 35% of its shares in SLT to NTT of Japan. The divesture process continued in 2002 with an additional 12% of share sold through an Initial Public Offering (IPO), which left the government with 49.5% (the remaining 3.5% was owned by employees). In 2003, TRCSL went further by issuing 27 new licenses to the several operators, which increased competition and resulted in a reduction of tariffs for international calls. In March 2003 policy makers in Sri Lanka established interconnection rules that mandated the obligatory provision of non-discriminatory interconnection on a cost-oriented basis, as determined by the TRCSL. The liberalised policy, however, seemed to be constrained by the limited applicability of the regulator's directives. For more than a year, in fact, no unaffiliated (*i.e.,* with their own network) operator was able to secure interconnection rights. This obstructionist behaviour by the incumbent was paralleled by the unwillingness or incapability of the TRCSL to exert its authority over the incumbent. The situation improved in 2004, when another operator,

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32 .   Based on Venugopal (2003).

33 .   Moreover, the TRSCL is short of non-engineer expert staff and has a high turnover of staff at the decision-making level (Knight-John, 2004).

VSNL, bought a gateway license to secure interconnection. Nevertheless, the case of interconnection rules showed the impact that a poorly functioning regulator can have on pro-competitive reforms (Zita and Kapur, 2004).

Figure 12.   Telecommunications in Sri Lanka (1990-2003)
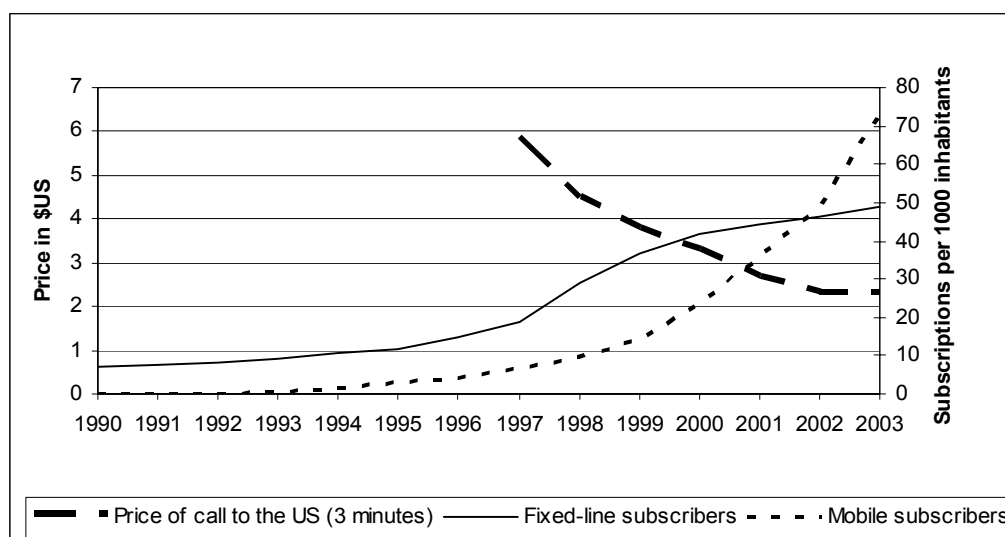
99.   The development of fixed-line and mobile phone subscriptions as well as the changes in the price of a three minute call to the United States in US cents in the period 1990 to 2003 is depicted in Figure 12. After 1996, the number of fixed-line services subscribers per 1000 inhabitants increased strongly in Sri Lanka, but was outpaced by the increase in mobile services subscriptions in 2002. In parallel, the price of international telecommunications services continuously fell since Sri Lanka's commitment to the RP, although cost of international calls are still high if compared to the international average.

c) Malaysia[34]

100.   The restructuring of the telecommunications sector in Malaysia started in the early nineties with the sale at the Kuala Lumpur Stock Exchange of a 25% stake in its PTO, Telekom Malaysia Berhad (TMB). In 1994, the National Telecommunications Policy (NTP) recognised competition as a regulatory principle in telecommunications services, and this led to the appearance of new entrants both in the fixed and mobile markets. A regulatory agency, Jabatan Telekom Malysia (JTM), was formally created.. Among its functions, JTM was involved in spectrum management activities, the prevention of illegal use of equipment, the enforcement of compliance with licence conditions and the monitoring of anti-competitive behaviours. However, lines authority between the regulator and the government were unclear and the scope and timing of the liberalisation became fairly highly politicized (Ure, 2000; Zita, 2004)

101.   Malaysia only partly adopted the RP on regulatory principles. It did not fully commit to competitive safeguards, though it mentions cross-subsidies and included weak provisions with regard to interconnection. No provisions concerning the allocation of scarce resources were included. In addition, regulations for licenses were quite opaque, with no publicly accessible policies on number, scope and conditions for new licenses, for example for mobile operators. The administration of the licence awarding

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34 .   Based on Venugopal (2003).

process was also quite non-transparent as often requests would bypass the JTM (sometimes not even involved in the decision making process) to end up on the Prime Minister's desk. In the authorities' view, the outcome was an oversupply of licenses in the market, so the government subsequently requires consolidation in the sector (Ure, 2000; Zita, 2004).

102.   Despite Malaysia's limited commitment to the RP, which locked-in the status quo of the existing reforms, further steps since 1996 brought about new policy actions concerning regulatory principles. The enactment of the Communications and Multimedia Act (CMA) in 1998 reframed Malaysia's regulatory structure between policy-setting, assigned to the Minister of Energy, Communications and Multimedia, and regulatory institutions, given to the Communications and Multimedia Commission (CMC). The CMC became an independent regulatory authority deriving most of its revenues from licensing activities. However, its five members are still appointed by the Minister, who retains the final decision power. The CMA also set up an appeal tribunal, which prohibits anti-competitive behaviour, monitors effective market-based rate setting, insures transparency in the licensing process and drafts regulatory policies. Additionally, the CMA established rules for the pricing of interconnection and an universal access fund.

103.   Figure 13 shows the development of fixed-line and mobile phone subscriptions and the price of a three-minute local call in the period from 1990 to 2003. In Malaysia, the number of fixed-line services subscribers increased during the 1990s but slightly fell after 2000. The number of mobile services subscribers strongly increased since 1998 and got ahead of fixed-line services in 2000. In 2003, Malaysian consumers were subscribing 2.5 times as many mobile services as fixed-line services. The price of a three minute local phone call fell from 5.19 US cents in 1995 to 3.57 in 1996 and was around 2.10 US cents in 2003.

Figure 13.   Telecommunications in Malaysia (1990-2003)
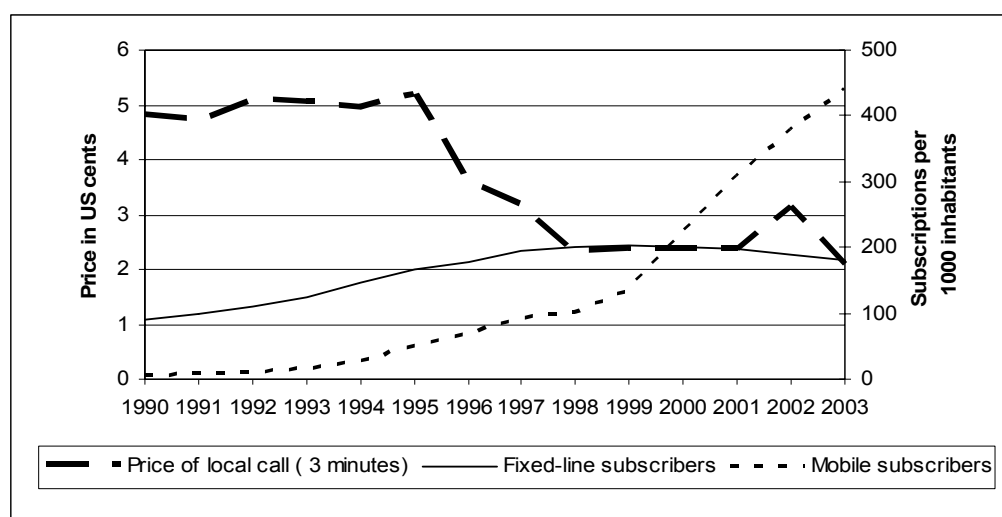
Source : World Development Indicators.

104.   To sum up, the RP creates the conditions for pro-competitive reforms through the legal implementation of the RP, which seems to occur fairly smoothly across the board. Nevertheless, some principles have proven to be harder to implement in practice than on paper. For example, the application of rules with regard to the allocation of scarce resources causes technical challenges to regulators. While frequency allocation is increasingly implemented through auctions, numbering and the transfer of numbers from one operator to another are still controversial issues in many countries. Thus, the effectiveness of this provision hinges on the power and independence of the regulatory authority as well as the technical and

economic expertise of its staff. The cases of Sri Lanka and the Caribbean countries showed that lack of independence and power to enforce their regulatory targets affect the potential implementation of pro-competitive reforms. Lack of capacity is also a constraining factor, especially when technically skilled staff is ordered to perform regulatory policy functions for which they have not been trained[35].

105.   The effectiveness of competitive safeguards included in telecommunications legislation might be influenced by the independence and strength of the regulatory authority to enforce competition rules.] This is also true in the case of interconnection, which represents a clear example of a somewhat difficult principle to put in practice. Sri Lanka provided a clear case where the incumbent, even in the presence of tough interconnection guidelines published by the regulator, made it technically difficult for new entrants to access its network. This suggests that, although in presence of formally adopted legal frameworks, independent regulators can experience difficulties in challenging the dominance of the incumbent. . Licensing issues are common across different industries, and the principles included in the RP address only issues of transparency that governments can easily meet. Nevertheless, as the Malaysian case shows, if transparency is not applied, the practical outcome can be less than ideal. Universal access is also a legitimate policy instrument, and its importance is recognised in the RP as long as it is pursued in a non-discriminatory and transparent way. Both licensing and universal access show the role that the RP has in guiding domestic policies toward a goal of policy convergence in which domestic regulation promotes and does not impair telecommunications service trade (Blouin, 2000).

4. Key reforms and potential extension of the approach to other services sectors

106.   In what follows, four examples are presented to assess the extent to which regulatory principles such as those included in the RP are relevant to other sectors. First, two sectors, ports and energy, which are characterized by vertically integrated natural monopolies, are examined. Then, the analysis will concentrate on financial as well as postal and courier services, which are less dependent on monolithic fixed assets. The sectoral examination will attempt to highlight relevant measures contributing to the creation of a competitive environment that is beneficial for trade. The analysis will take into account previous liberalisation efforts in order to consider possible key regulatory disciplines that would be appropriate for the sector to lock in past reform and encourage further liberalisation.

a) Port services

107.   The first case of a natural monopoly examined is the port sector. In recent decades, port sector reforms have been carried out in response to increased market demand for efficient logistics[36]. Excessive logistics costs can be a burden for many countries acting as an additional import duty on all goods entering the country as well as a tax on exports. Port inefficiencies, in particular, are among the most relevant transport-related factors which negatively impact a country's competitiveness[37].

108.   The need for efficient facilities and intra-modal services has altered decision making criteria of port users from a choice based on pure location to a decision taken considering the overall quality of services and interconnections provided at the port. Modern ports are therefore operating in a highly competitive marketplace. This growth in competitive pressures has resulted in an increase of importance of the services provided to users, as they have assumed a progressively more relevant role in determining efficiency and competitiveness of ports.

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35 .   The creation for Caribbean policy makers of a specialised training in telecommunications regulations through the University of the West Indies has represented an important step forward (Stern, 2006).

36 .   See TD/TC/WP(2006)3/FINAL

37 .   See Sanchez et al. (2003).

109.   Intraport activities include the building of the physical infrastructure, the provision of infrastructural services and the coordination of services to assure the proper functioning of the port. Port authorities, in general, are in charge of the overall functioning of the port, while national/local public authorities concentrate on land-based access to the port. Infrastructure related to maritime access to the port is generally managed by public authorities, with the exception of breakwaters, lights and buoys, which are normally assigned to port authorities (World Bank, 2004).

Market structure and the need for regulation

110.   Despite the monopolistic nature of port infrastructures, services offered by a port are multiple. Their features are conducive to competition and the appropriate form of regulations can differ by function of each service. A major consideration while looking at network utilities like ports should be given to the separation of activities that are naturally competitive or without major structural impediments to entry from those with extensive scale economies and sunk costs. Port services are naturally competitive, as market mechanisms tend to operate without major interference or violation of property rights. On the other hand, national monopolistic elements (as access to ports and basic infrastructure), which are characterized by considerable sunk capital, need to be regulated or even managed by the public sector.

Usage of essential facilities

111.   When looking at port services and possible ways to stimulate private sector participation in the sector, special attention should be paid to whether the service to be opened up requires an exclusive use of one of the port's fixed assets. While in telecommunications and energy the concept of essential facility has been developed extensively, in port services, practice has often preceded theory. For instance, in the case of smaller ports, which tend to have scarcer space, the granting of some exclusivity on fixed assets might be necessary, especially to ensure proper coordination of port activities. Nevertheless, scope for liberalisation is present in many ports when looking, in particular, at cargo handling and ancillary services as well as berthing and consignee services.

112.   The introduction of licenses, for example, can allow different operators to qualify for services provision and to compete amongst them. When competition is introduced, the need for regulation should focus on the prevention of collusive anti-competitive practices. It is possible, in fact, that after liberalisation, a few firms might find themselves in a situation of market concentration and may try to abuse their dominant position to command prices and to seek rents from port users[38].

113.   Pro-competitive reforms in ports can take different forms, and most recurrently they appear as follows:

- *Interport competition.* This is the highest level of competition as different ports compete against each other in the attraction of shipping companies. Overall efficiency in traffic processing and in guaranteeing connections to major networks is the key to success. This external competition determines in large part the type of internal regulation needed by the port.

- *Intraport competition between terminals.* This form of competition focuses on the terminal level, while leaving the port technically integrated. Terminal operators are completely responsible for their terminal. The port of Buenos Aires in Argentina represents a successful example in the application of this approach.

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38 .   Brazil, Zambia, Jamaica and Turkey provide interesting case studies on port services regulation. See COM/DAF/TD(2005)5, DAF/COMP/GF/WD(2005)51, DAF/COMP/GF/WD(2005)21, and DAF/COMP/GF/WD(2005)32.

- *Intraterminal competition between service suppliers*. Competition is introduced at a lower level. Within a terminal, service providers compete in stevedoring, warehousing, forwarding, and other services, as long as the terminal space allows it. Regulators discipline service providers by employing licensing requirements to ration the number of competitors while making concessions financially attractive.

- *Competition for the exclusive right to provide services*. This approach extends the licensing principle to a sole provider. This also represents the most direct way to invite private capital to participate in the servicing of small ports. As this process effectively creates local monopolies, it is important to have regulatory remedies (through specific concession provision or a supervising authority) to prevent monopoly exploitation. (World Bank, 2004)

Regulation of entry

114.   As seen, the port sector has some unique features that make the effectiveness of pro-competitive disciplines dependent on the restructuring of fixed assets. Nonetheless, public authorities can be proactive in introducing reforms that can facilitate private participation in ports. Measures such as berth and terminal expansion, re-structuring of ports into several terminals as well as allowing forms of outsourced operating ownership of the infrastructure to the private sector can enhance competition. Depth of competition and associated regulatory requirements depend on specific ports elements, as dimension, capacity and existing external competition. A rule of thumb to assess the degree of desirable competition in container ports has been developed through some volume thresholds. A port handling less than 30,000 TEUs[39] a year is better equipped to have a single operator and a regulator overseeing the charges. Between 30,000 and 100,000 TEUs a year, it is possible to have intra-terminal competition with several services operators competing on cargo handling operations. If the port volume handles more than 100,000 TEUs a year, then the competition becomes intraport, as there are several terminals and berths competing with each other. Port Authories can at this level grant the terminal operator the faculty to directly collect charges for terminal usage. Over 300,000 TEUs a year, the port reaches international port status, competing for traffic with other major ports around the world. The higher level of competition reduces the need for price oversight by the Port Authority (World Bank, 2004).

Independent regulatory agency

115.   The presence of an independent regulatory agency is fundamental in assuring economic efficiency of port services. While some nations have government level agencies overseeing the sector, it is not unusual for countries to lack a regulatory body for seaports. In that case port authorities are asked to perform other tasks like investment planning and financing as well as tariff regulation, including those charged by private operators to port users. In structuring a regulatory framework for port authorities, it is important to have responsibilities for port operations and competition regulatory tasks formally separated. This encourages transparency and independence in the decision making process[40]. Instead, when performing the two functions, there is a latent risk of agency capture and of a rise of possible conflicts of interest. Best practice says it is preferable to have two different entities handling the tasks alone (World Bank, 2007).

116.   Establishing an independent regulatory agency is a pro-competitive regulatory reform can bring benefits in terms of international competition. The case of Singapore is illustrative. Before being incorporated in 1997, the Port of Singapore Authority (PSA) was acting as both the regulator and terminal

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39 .   Twenty-Foot Equivalent Unit.

40 .   World Bank (2007) provides a list of safeguard measures for creating an independent regulatory body.

operator. The incorporation allowed the unbundling of the two activities. The Maritime and Port Authority of Singapore became regulatory authority and the PSA Corporation turned to the provision of port services. Freed from regulatory functions PSA expanded internationally by fostering ventures to construct and operate terminals in ports around the world. For example, PSA's first international joint venture in 1998 was with the Port Authority of Dalian in Northeast China. This venture brought competition in the Dalian Dayaowan Container Terminal, where the joint venture owns, develops, manages and operates three container berths. The PSA Corporation now has stakes in 19 ports in 11 countries (Tongzon, 2006).

Anti-competitive safeguard

117.　　In introducing private sector participation, authorities should be careful when transferring public ports in the hands of private operators to advert potential anticompetitive behaviour. The absence of a regulatory framework overseeing competition issues could facilitate the emergence of practices undermining efficiency in port management and negatively impacting the economy as whole. To control these practices, regulatory agencies have to be in place to prevent the utilization of excessive market power from the incumbent or newly formed market players.

118.　　Anti-competitive behaviour from a port operator with a dominant or monopoly position could take several forms:

- Price gouging. Using monopoly power to charge excessive tariffs for port services.

- Service bundling. Extending monopoly power in one area of port operations to another potentially competitive area. Also referred to as tying arrangement. For example, a terminal operator's extension of a monopoly position in the provision of cargo handling to require use of their tug assist services rather than obtaining those services from an independent provider.

- Increasing entry barriers. Constructing hurdles to increase the share of the market needed to operate at maximum efficient scale, raising absolute costs of entry, or by tending to foreclose competitors from needed resources or outlets.

- Raising rival's cost. Increasing the cost of services required by a rival to place him at a competitive disadvantage.

- Exclusive dealing. Requiring suppliers to sell only to them and not to any potential competitor. An example would be restricting a tugboat company from providing service to a rival terminal.

- Predatory pricing. Selling services below cost to induce a rival's exit from the market, deter future entry or dissuade a rival from future competition. An example would be temporarily lowering container handling charges below long-run marginal costs to force a rival out of business.

- Price discrimination. Similar to predatory pricing in that selective price discrimination by a powerful seller can eliminate competition or otherwise entrench the discriminating seller's monopoly power.[41]

119.　　Even when competition in port services is encouraged, it is not uncommon for the sector to register the presence of limited numbers of direct competitors. Therefore, concentration ratios have been

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41 .　　Taken from World Bank (2007), p. 276. However, some elements in this list would not be regarded as anti-competitive behaviour under certain national competition laws.

traditionally high as well as the risk of cartels and collusive practices. Nonetheless, port sector reforms, especially in developing countries, have been quite successful in progressively introducing private sector participation.

Impact of pro-competitive reforms

120.   In developing and transition economies almost 25 billion USD have been invested in 238 seaport projects between 1990 -2005 (see Figure 14). Port reforms have drawn a lot of interest because of their key role in enhancing a country's economic competitiveness and trade performances. As ports represent strategic assets for economic development, decisions on the port reform agenda have to be taken in parallel with the development of a regulatory framework for the industry. Best practices suggest taking regulatory issues into consideration early on in the reform process in order to avoid costly re-regulation efforts later on. With the introduction of private participation, the need to regulate behaviours arises again, especially when the competition level remains low.

Figure 14.   Cumulative Investment in Seaport Projects with Private Participation in developing and transition economies between 1990-2005
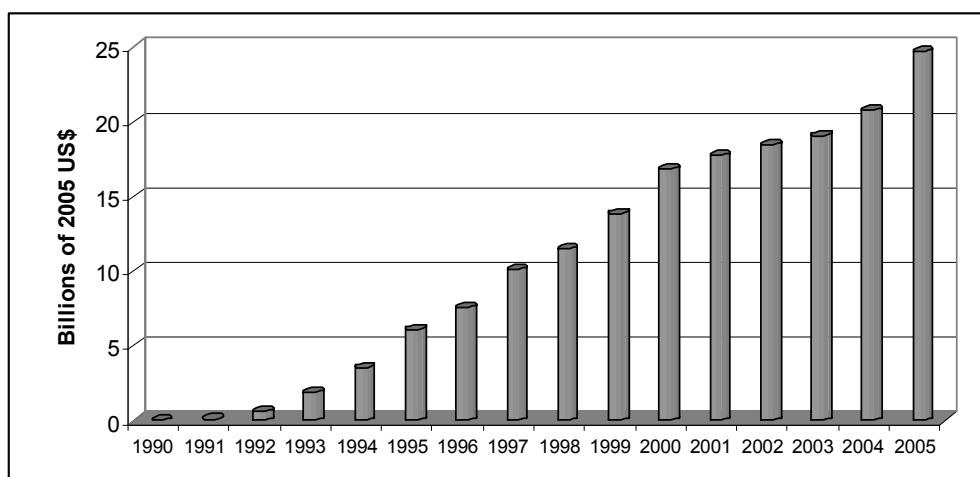
Source: OECD based on PPIAF/World Bank's Private Participation in Infrastructure Project database.

121.   Key elements in designing a pro-competitive reform strategy contemplate structural and regulatory remedies. As seen earlier, structural changes, allowing increased participation in the sector can occur by introducing new terminals, splitting existing ports into terminals, dividing port operations within terminals and by going through the process of outsourcing port operations to private entities. With these options in mind, the pro-competitive reform strategy should also plan for regulatory enhancements that can increase efficiency of ports by correcting market imperfections. This encourages ports to behave as if they were operating under perfect market conditions. In this case, typical regulatory remedies include tariff filing and tariff and rate of return setting. (World Bank, 2007)

Box 5. Experiences in fostering pro-competitive reforms in the port sector in Latin America

Countries have adopted different approaches in fostering port regulation and competition. Colombia and Guatemala provide opposite examples in Latin America on the effectiveness of pro-competitive reforms in the port sector. The Colombian Port of Cartagena in the late 1980s was part of an overall trade liberalisation strategy that led to the drastic reduction in tariffs and the elimination of high barriers protecting the local industry. In recognizing the value of economic liberalisation, Colombia understood that trade reforms would need to be accompanied by efficiency gains

in its infrastructure assets. Ports, in particular, were characterized by sub-standard assets and costly operations. The situation deteriorated in 1990, when shipping companies decided to impose surcharge of $2.50 per ton in Colombian ports, which affected the trade liberalisation process negatively. With ports representing a constraint to economic development, authorities in 1991 drafted a law addressing the liquidation of the government's port agency and created a public−private partnership for port operations, which still represents a model for pro-competitive port reforms. Since 1994, when private operators were given concessions to run Colombia's ports, things have turned around. A new private operator, Sociedad Portuaria Regional de Cartagena (SPRC), took charge of the terminal previously operated by the government agency COLPUERTOS resulting in an increase in cargo volume which grew from about 93,000 to nearly 400,000 TEUs per year. This was accompanied by more than $150 million in investments as well as operational efficiency gains. For example, between 1993 and 2003, containership waiting and turnaround time was reduced from 10 days to 0 and from 72 hours to 7 hours respectively. Cost per move went down from $984 USD to $224 USD while hours worked went up from 16 to 24.

In contrast to Cartagena's accomplishments, there is the experience of the port of Santo Tomas de Castilla in Guatemanala. Santo Tomas specializes in containerized cargoes and competes with a private terminal, Puerto Barrios, located nearby. Santo Tomas represents the main gateway to North America for most textile exports, but its performance has been undermined by chronic inefficiencies and costs. Most cargo has been diverted to Puerto Barrios, whose operators enjoy a concession to provide third-party cargo handling services, and to Puerto Cortes in Honduras.

While Cartagena was celebrating 10 years of the successful privatization process, pro-competitive reforms in Guatemala's port system did not move forward efficiently, in part affected by a regulatory framework, which did not clearly specify the correct functioning of a concession. In this case, the concession for public ports resembled a lease agreement due to the lack of any requirements for substantial investment on the part of the concessionaire. The consequence was that the attraction of private sector investment was minimal, with the operator limiting itself to managing the facilities. The authority gave private companies the rights to operate some of the proprietary cargo-handling services as well as other services, which container ships were obliged to use. The type of private sector participation model implemented in Santo Tomas did not bring efficiency to the port, as a weak regulatory framework added costs to port operations. In comparison to Cartagena, the increase in shipment costs due to inefficiency is estimated to be $2,721 USD. This mark up makes Santo Tomas a less appealing choice in eyes of carriers as well as creating a competitive burden for customers, exporters and the Guatemalan economy.

Source : Kent and Londono-Kent (2003)

b) Energy services

122.   At first most industries in the energy sector were dominated by state-owned vertically integrated utilities that held a naturally monopoly over production, transport and distribution of energy products. Since the 1970s, privatisation of state-owned utilities, vertical unbundling (separation of generation from transmission and distribution) and regulatory reform extended the opportunities for private-sector participation in the energy sector[42]. Domestic liberalisation efforts advanced not only in OECD economies, but also in developing countries. Early stage experiences suggest that liberalisation of energy markets improved industry performance and reduced prices in the presence of effective competition (Speck and Mulder, 2003). However, only a few countries have fully liberalised their markets. Public ownership and the degree of horizontal and vertical integration of the industry remain still high. [43]

123.   Although only a limited number of countries have accomplished full liberalisation of their energy market, domestic and international pressures for pro-competitive reform have contributed significantly to

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42 .   Several technologies and primary sources of energy are employed to produce electricity. Some are non-renewable (coal, petroleum, natural gas, and uranium) and other renewable (biomass and hydro, wind, solar, and geothermal).

43   The energy sector includes several industries involved in the production and sale of energy services. This section focuses on the generic and most recurrent features of the sector. Thus, the analysis of industry principles applies in varying degrees to different energy sources.

the progress made so far. During the WTO services negotiations, proposals were made to consider the adoption of an energy reference paper in order to lock in the domestic reform process and encourage the development of a more competitive environment[44]. Some of these proposals drew parallels in the way the telecoms and energy industries are structured and the similar undergoing process of regulatory reform. Thus, some guiding disciplines included in the telecommunications, like competitive safeguards, might also apply to the energy sector. (Evans, 2002).

Market structure and the need for regulation

124.   As seen, traditionally a single entity has been granted the monopoly over energy generation, transmission and related system operations. This body transfers power to the distributor(s) that service households and businesses throughout the countries. The complementarities existing between generation and transmission lead to the formation of vertical integrated structures where economies of scale could be taken advantage of[45]. Competition is limited as the network integration becomes an essential element of the natural monopolies. Power supply is also a naturally rigid process where obtaining real-time equilibrium of supply and demand is complicated and involves a high degree of system coordination. The complexity associated with the replication of the vertical relationship with market mechanisms makes maintaining a natural monopoly a practical option for energy sector policy making.

The usage of essential facilities

125.   Thus, the introduction of competition is more feasible in the power generating and supply service segments. The task seems harder at the network/grid level, when in presence of essential facilities. Some degree of restructuring is therefore necessary. Similarly to the port industry, there are several other policy options for organising the sector and introducing pro-competitive reforms, depending on the degree of competition desired:

- Monopoly: the traditional status quo, where a single entity generates all electricity and delivers it over a transmission network to distribution companies or costumers.

- Single buyer: where a single agency buys electricity from competing generators, has a monopoly on transmission, and sells electricity to distributors and large power users without competition from other suppliers.

- Wholesale competition: where multiple distributors buy electricity from competing generators, use the transmission network to deliver it to their service areas under open access arrangements, and maintain monopolies on sales in their service areas.

- Retail competition: where customers have access to competing generators, directly or through a retailer of their choice, and transmission and distribution networks operate under open access arrangements. However, retail competition may not involve all customers but may be limited to industrial customers. (World Bank, 2004)

126.   The development of different degrees of competition in the energy sector requires selected regulatory intervention depending on the sequencing of the reform process. Regulatory initiatives could concentrate on exercising price controls and on the monitoring of anti-competitive behaviors such abuses

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44 .   WTO (2000, 2001a, 2001b).

45 .   Downstream activities in the energy sector (transmission, supply) are covered by GATS, whereas GATT covers power generation (production), which accounts for half of the revenues in the value-chain and is the segment with the greatest potential for competition (WTO, 1998b).

of market power or limitations on network access. Hence, the presence of a regulatory framework combined with interventions on market structures is necessary if the objective is to pursue a strict separation between transmission, generation, and distribution activities. Economic regulation of the energy market enables governments to ensure a fair treatment of market participants and consumers.

Independent regulatory agency

127.   One of the most critical elements for the effectiveness of pro-competitive reforms is therefore the establishment of a dedicated regulatory agency operating in a neutral and independent way vis-à-vis political pressures. Similarly to ports and telecommunications, specialized technical skills are required to govern a sector that often, especially in developing countries, is administered by government departments where the regulatory function is only one of their assigned tasks and where conflicts of interest are latent. Effective agency empowerment is also a key issue, as putting the legislative framework in place has often proven to be insufficient. Without decision-making autonomy and an appropriate framework of assigned competencies, the legitimacy of the regulatory agency can be substantially undermined.

Universal access

128.   Another key discipline of energy services provision (as in telecoms) is universal access. Pro-competitive reforms in energy need to take into account the social dimension of services provision. Extending access, but also determining prices and quality of energy services is a difficult task for regulators as often commercial interest are not necessarily converging with poverty reduction efforts. While for poor households access to energy services is a very practical step for welfare improvement, connecting these segments of the population is often neither economically nor financially convenient for energy providers.

129.   Among possible public policy responses to this tension, there is the employment of ad-hoc financial support measures to accommodate for the cost of extending the network to areas with low income. If the energy cannot be produced at an affordable level for poor households, government can employ subsidies to finance the gap. They can be given directly to the service provider or toward subsidizing connection charges, the latter option proving more effective in targeting the intended beneficiaries. When the unconnected population is smaller than the connected, some connection cross-subsidies can be utilized to spread the cost of expanding the network to the consumers that have more possibilities to pay. Even when access is provided to low-income households, the need to protect them from general tariff increases also arises. Regulatory policy responses include the use of lifeline tariffs, targeted tariff discounts, vouchers, or tariff re-balancing.

Impact of pro-competitive reforms

130.   Pro-competitive reforms in the energy sectors in developing countries have been quite relevant in past 15 years, as private sector participation has been gradually introduced. In developing and transition economies almost 300 billion USD have been invested in 1,309 energy related projects between 1990-2005 (see Figure 15)[46]. Zhang et al. (2002) studied the effects of privatization, competition and regulation in the electricity sector in developing countries. They found that the introduction of pro-competitive reforms appears to bring benefits to developing countries in terms of service penetration, capacity expansion,

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46 .   Sub-categories are as follows: a) Electricity (1,071 projects for a total of 251 billion USD) and b) Natural Gas (238 projects for a total of 48 billion USD).

labour efficiency and prices charged to industrial users[47]. However, private participation in natural monopolies like energy requires the design and implementation of a regulatory framework and related instruments. These normally focus on regulating market structures, protecting providers and consumers as well as assuring affordable access. However, regulating a line of business that offers high profit opportunities and impacts political opinions sensitive to energy prices is not an easy task as it attracts both a high degree of political interference and rent-seeking behaviours among economic actors.

Figure 15. **Cumulative Investment in Energy Projects with Private Participation in developing and transition economies between 1990-2005**
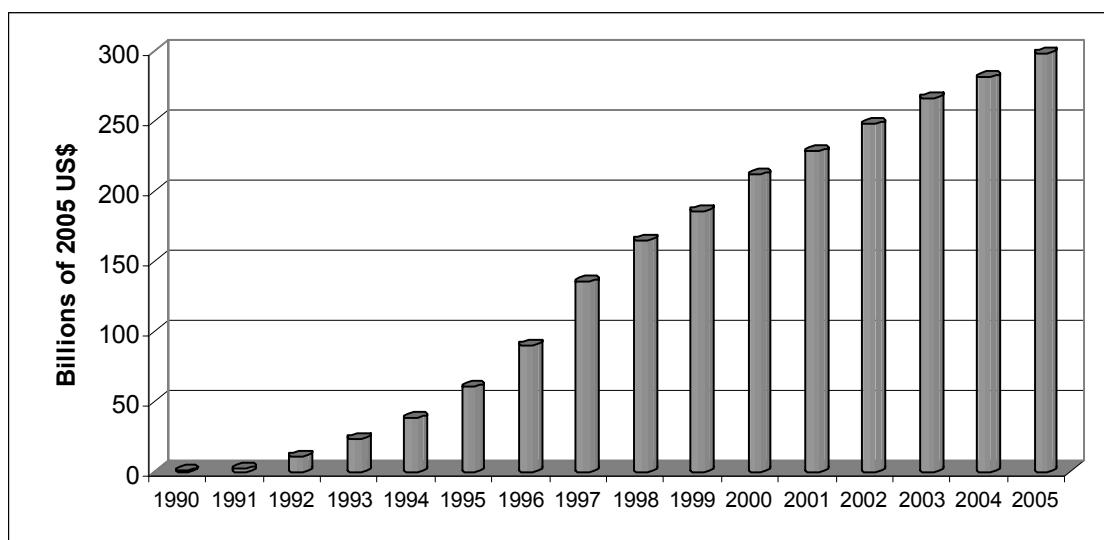
Source : OECD based on PPIAF/World Bank's Private Participation in Infrastructure Project database

131.   To minimize shortcomings, having independent regulators is a milestone step and the basis for multilateral guiding principles. Regulators can enforce disciplines regarding non-discrimination and transparency in the allocation of scarce resources, interconnection cost, legislation and bidding procedures for new energy-related infrastructure projects could ensure fair and competitive energy markets as well as reduce incentives for corruption. Additionally, they can limit the ability of a major supplier to abuse a dominant position and to refuse access to electricity transmission networks, pipelines and other essential facilities would strengthen competition and reduce horizontal and vertical concentration of energy suppliers.

132.   The energy sector, likewise ports and telecommunications, represents a situation of natural monopoly, shows that pro-competitive reforms needs substantial sectoral restructuring to be effective. As seen in energy, for example, while the distribution network may be a natural monopoly, power generation and retail services are areas where competition can be introduced. In this case, regulatory intervention is needed to ensure fair treatment for those actors that want to access the network.

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47 .   It should however be indicated that regulatory reforms had sometimes mixed results in the energy sector and that the literature is less unanimous about the benefits of liberalisation than in other sectors, such as telecoms.

c) Financial Services

133. Financial services underwent liberal reforms during the 1990s, which opened domestic banking markets to foreign competition. However, banking concentration still remains very high in many markets, which could be an obstacle to effective competition and genuine market-opening[48]. Moreover, the prevalence of prudential regulations has so far reflected the special character of banks and the national interest in protecting the value of the incumbent. However, financial sectors are evolving around the world with technological progress changing the way services are delivered. Increasingly sophisticated delivery of financial services makes determining financial services regulatory principles a daunting task. As the sector is increasingly relying on networks for the production and distribution of financial services, the presence of well-designed competition policies resembling those adopted by network industries (like telecommunications) is fundamental.

134. Financial intermediation expansion remains a key tool for economic development. Financial sector opening is deemed likely to develop the depth of financial services through innovation and capital re-allocation. Competition could encourage reduction in cost and consequently benefit consumers. However, competition occurring through financial services liberalisation is normally accompanied by a set of complementing rules that affects the impact of pro-competitive reforms.

The need for regulation

135. Legitimate regulatory principles for financial services can sometimes give origin to anti-competitive behaviour that can resemble similar ones experienced when dealing with network utilities. Rules regulating entry, for example, are good instruments to manage the competition/regulation tension, although a proper balance is not always easy to obtain. Elements like the establishment of a licensing system or of a minimum capital requirement can determine the actual level of competition/regulation occurring in practice. Highly restrictive entry rules represent an obstacle to the process of financial services liberalisation and negatively affect access by new players. Thus, limiting sector participation can reduce the occurrence of efficiency improvements and technological innovations, while encouraging rent seeking behaviour. Equally important is the presence of efficient exit rules without which financial systems can end up with undercapitalized institutions subject to unfair competition. Industry exit and failure possibilities can induce proficient and prudent behaviour.

136. One of regulators' main concerns in sequencing the introduction of pro-competitive reforms is the possible occurrence of financial instability due to insufficient regulatory supervision. The financial sector tends to be considered quite strategic by national governments with some financial services being interpreted as having a 'public goods' function. Hence, when faced with high regulatory pressures, public authorities are called upon to exert constant surveillance of the system stability. With the possibility of market failure due to extensive informational asymmetries involving the parties to financial transactions, public intervention is deemed as necessary and desirable.

Multilateral disciplines

137. This right of intervention is contemplated in the 1997 GATS Annex on Financial Services (See Box 6), which acknowledged the importance of financial services liberalisation while also 'carving-out' an exception to the Agreement to provide for domestic regulation of financial institutions. The contracting parties are not to 'be prevented from taking measures for prudential reasons, including for the protection of

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48 . The World Bank (2003) shows that asset and deposit concentrations of the five largest banks are higher than 85% most countries, while the five biggest banks in Germany, the UK, and the US do not make up more than 30% of the market.

investors, depositors, policyholders or persons to whom a fiduciary duty is owed by a financial services supplier, or to ensure the integrity and stability of the financial system'.

Box 6. Understanding on Commitments in Financial Services and the GATS Annex on Financial Services

The *Understanding on Commitments in Financial Services* provided guidelines on how to schedule commitments for the sector according to a pre-set list of issues. This list varies from the management of monopoly rights to the rights of establishment of a commercial presence, etc. These measures allowed an increased number of member countries to improve their schedules of specific commitments with the removal limitations on foreign financial service providers. The full content can be found at: http://www.wto.int/english/tratop_e/serv_e/21-fin_e.htm. So far 31 countries have opened up their financial services according to this *Understanding*. However, a total of 56 revised offers (representing 70 countries) were submitted by 1997 and annexed to the Fifth Protocol to the GATS.

The *GATS Annex on Financial Services* sanctioned the submission of government policies affecting trade in financial services to the multilateral rules of the GATS on a permanent basis. The *Annex* indicates some specific measures for government to be used in the formulation of compliant domestic financial services policies. For instance, it listed a non-exhaustive directory of insurance, banking and other financial services that are covered by GATS rules and commitments. Moreover, it included a list of activities deemed as "services supplied in the exercise of governmental authority", which were exempted from the GATS agreement. For example, central bank activities or public retirement systems were excluded. Provisions were also made with regards to domestic regulations. What became known as the prudential carve-out stated that WTO members retain the possibility of taking measures for prudential reasons as long as they are not used to circumvent GATS rules or commitments made under the GATS. These prudential regulations must aim at the protection of investors, depositors, policy holders or persons to whom a fiduciary duty is owed by a financial service supplier. They can also be used to ensure the integrity and stability of the financial system.

Note: The 1997 WTO agreement on financial services was finalized on December 12, 1997, and came into force on March 1, 1999.

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138.   Financial services' domestic regulations are in place for national authorities to supervise financial institutions and control the systemic risks. The nature of financial services firms, which is increasingly trans-national, requires closed coordination between different regulators in different jurisdictions. Regulation and supervision cooperation are needed for the effective implementation of pro-competitive reforms. However, regulatory principles and supervision convergence at the international level has been limited primarily to the recognition of non-legally binding best practices. The adherence to such is mostly done through peer and market pressure.

139.   Another forum provides regulatory guidelines at the multilateral level. The Basel Committee driven 1988 Basel Risk-based Capital Accord, also known as Basel I, represents the most widely known effort to set out standardized prudential disciplines and supervisory policies. The Basel Committee issued its Core Principles for Bank Supervision or BCP, which have been recognized as the world's best practice for bank supervision. These principles, however, needed to be integrated by a further agreement, which is being currently implemented, aiming at strengthening the effectiveness of these informal measures (Basel II).

140.   When designing pro-competitive reform strategies for financial services in developing countries, it is important to understand the origin of the regulatory principles included in the Basel II Accord. Although being proclaimed an international standard, they have been designed mostly with developed countries in mind. Barth et al. (2006) see a hidden danger in taking for granted the assumption that the actions of domestic regulators always pursue public interest. Especially in developing countries, regulators might lack the authority to enforce these rules in an efficient manner. Hence, weak institutional environments and low managerial capacity might lead to abuses and rent-seeking behaviour, in turn undermining pro-competitive reform efforts.

Box 7. China's experience in liberalizing financial services

China provides a successful example of the impact of GATS best practices in financial services liberalisation. China's GATS commitments are deemed to be considered the most far-reaching services reform program negotiated in the WTO. Chinese authorities committed to abolish most restrictions on foreign entry and ownership, and moved away from discrimination against foreign firms. These pro-competitive reforms have been important, although serious banking sector problems persist. Under-capitalization, a large percentage of non-performing loans, continued extensions of low-interest policy loans to state enterprises, as well as corruption and other abuses by bank loan officers are among the most frequently mentioned.

Changes in the financial sector started with China's joining the WTO in 2001. These include further liberalisation of interest rates, decrease in the restrictions on bank ownership and improved operational autonomy for financial institutions. The 2006 IMF Article IV consultations acknowledged China's progress in restructuring and partially privatizing three of the four major commercial banks. Private sector participation occurred through the selection of major foreign financial institutions as strategic investors with minority ownership stakes. It is expected that foreign banks will transfer the needed technical expertise and promote better governance. In the case of China, obligations at the multilateral level have stimulated pro-competitive reforms in the financial sector. However, the full realization of reform gains and the sustainability of the liberalisation process still depend on the implementation of necessary regulatory arrangements in the sequencing of reforms. The GATS regulatory carve-out can work in favour of pro-competitive reforms if required prudential regulations (as for example, the capital adequacy rules that should come into effect in China in 2007) are administered and enforced in a fair manner by the public authorities (IMF, 2006).

Source : Mattoo (2003) and IMF (2006).

Independent regulatory agency

141.   Thus, to address market failures, prudential regulations need to be in place and enforced. The risk of regulators incurring moral hazard issues is present as policies aimed at the prevention of systemic risk can stimulate anti-competitive behaviour. As in the telecom sector, the presence of a national regulatory authority that is independent when performing supervisory functions is fundamental. An independent regulatory authority improves accountability of the financial system, promotes its proper functioning and provides confidence in the markets. Well-designed prudential regulation may not be effective without adequate supervision and enforcement.

Universal Access

142.   Looking at the issue of universal access to financial services, the comparison with the telecom sector is not straightforward. Although financial services could be considered a basic need, the inclusion of a principle establishing domestic rules for providing universal service can be tricky. The employment of universal services obligations to provide subsidized access in remote areas can lock-in technologies soon to become obsolete. They can also stimulate monopoly rents in exchange for universal access similar to those experienced in the telecom sector (Claessens et al., 2003). The issue of access is not necessarily resolvable with more availability of financial services as it is sometimes linked to the lack of interest on the demand side. On the supply side, the issue of access is constrained by the fact that financial institutions have to perform a thorough credit analysis process to determine creditworthiness of potential clients.

143.   With that in mind, the issue of penetration exists, as geographical elements like the absence of bank branches or delivery points in remote areas are limiting access. Nevertheless, even when it is not financially or economically convenient to deliver the service, public policy can encourage the provision of access to financial services at affordable prices. Especially in developing countries, where penetration remains low if compared with developed countries, networks of financial services can expand into remote

areas via microfinance institutions. Regulators can think of building more inclusive financial systems when designing pro-competitive reforms by addressing entry and exit constraints for those financial services providers that want to serve remote areas.

Anti-competitive practices

144.   Looking beyond access issues, financial services industries are experiencing the growing importance of networks in the production and distribution of services. For example, with technological improvements, payment services are increasingly being provided by corporations other than banks that have access to the payment network and infrastructure. However, incumbents have traditionally controlled access to the payment systems and set standards for the industry. South Africa provides a good example of how networks of payment systems represent an essential element in the production of financial services (Box 8). Likewise, financial services information, in the shape of credit bureaus controlled by the incumbent bank, has become network goods. The withholding of that information from interested firms wishing to expand into offering lending services can negatively affect competition by limiting the production of these services.

Box 8. Anti-competitive practices in the South African payment system

Controlling network access can become an instrument for large banks to limit competition by charging high access fees for small banks and for non bank financial institutions. This issue emerged in South Africa as a result of the 2004 Competition in South African Banking Report. The study uncovered the possible existence of a complex monopoly in the operation of the payment system. Four large banks (ABSA, FirstRand, Nedcor and Standard Bank) were dominating the payment system managing virtually all (99.7%) of the throughput. This high degree of concentration was found to be favoured by the requirement that only institutions regulated by the SA Reserve Bank (i.e. banks, mutual banks, and branches of foreign banks) were eligible to become members of a payment clearing house and to keep a settlement account there. These financial and procedural mechanisms in payment processing favoured account holding banks and related parties. These provisions were deemed to weaken competition and to generate disincentives for both bank and non-bank competitors to compete with the account-holding banks.

With ownership and control of the payment system network infrastructure in the hands of the four banks, a cartel arrangement was more likely to occur. The report suggested a number of measures to improve the competition in the payments system, as, for example, improve bank entry with the establishment of second and third tier banks and the enabling of electronic transmission facilities by non-banks. Increased access to payment systems may affect positively the penetration of financial services to previously unbanked sectors of South Africa. Also, foreign participation has increased with the 2005 partial privatization of ABSA to Barclays. This $5.4 USD billion transaction has been the largest single foreign direct investment since 1994.

In 2006, the Competition Commission of South Africa sponsored an independent investigation on the matter. It concluded that the national payment system of South Africa is highly efficient although at the same time lacking features that might enhance competition. In particular, it questioned a) the market power of banks setting payment systems fees, b) the price setting negotiating mechanisms, c) the absence of market conduct regulations and d) the regulatory gap for the participation of non-banks. Finally, it highlighted the unevenness of the playing field of the payment infrastructure at the wholesale and retail level.

Source : Falkena (2004), Napier (2006) and Akinboade (2006)

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145.   As seen, the networking aspects of financial services rely mostly on a nation-wide system of branches and payment systems, which makes a RP approach for financial services different from telecommunications. However, some disciplines can be identified and can be abstracted at the multilateral level. For example, pro-competitive disciplines could address deregulation of entry and exit restrictions for domestic and foreign suppliers. Moreover, in order to reduce transaction cost, promote safety of transactions and prevent money laundering, common regulatory disciplines could provide for cost-based, transparent and non-discriminatory payment settlement between financial institutions. A multilateral approach could possibly address anti-competitive practices and restrain the withholding of technical and

business information to improve the functioning of the technical payments systems and the security of transactions.

d) Postal and Courier Services

146.   The need for appropriate regulatory disciplines in postal and courier services has also been stressed by several WTO Members and a proposal for a reference paper has been circulated (WTO, 2005). Key issues in the postal sector are similar to those discussed in telecommunications: the need for independent regulation and access management, the provision of universal service and the prevention of anti-competitive behaviour are among them. On the other hand, courier and express delivery service are less concerned by issues like universal service obligation and letter box accessibility, but face operational constraints (i.e. when seeking to obtain licenses, concessions, etc.) as well as several other regulatory impediments.[49]

147.   The similarity with the telecommunications sector is not surprising as integration between postal operators and the provisions of telecoms services dates back in the 19th century, when these activities represented the beginning infrastructure for the development of nation-states. While supporting the expansion of communication activities as a tool of national cohesion and regional development, postal operators realized extensive networks of presence points. Moreover, the policy environment granted postal operators a monopolistic position protected by natural boundaries. This shared experience also explains the similar characteristics of postal operators across countries.

148.   Thus, the postal market has enjoyed a service monopoly that required targeted regulation. In exchange for monopoly privileges, postal operators have been held accountable for the provision of universal services at affordable rates and for the accessibility of letter boxes. Moreover, their performance has been required to adhere to prescribed standards of service along the large network of post offices. However, the absence of relevant sunk costs in the industry lowered the capacity of the incumbent to exercise market power. In addition, the scope of this type of monopoly has been gradually eroded by the development of new postal-type of services. Technological progress has delivered competitive pressures to the highly labour intensive activity of traditional postal operators. They have progressively lost market share to private mail companies, especially in the international market. Courier services suppliers, in particular, now offer a more dependable, faster and sometimes cheaper service alternative.

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49   When operating on specific market segments, courier and express delivery services can to a certain extent compete with traditional postal operators. In this situation anti-competitive practices of the incumbent, especially when endowed with regulatory functions, combine with bottlenecks deriving from other service industries. A typical example of the latter is represented by limitations or access to air transport services, which represent a key element for the efficiency of courier and express delivery operations.

Regulating access

149.   Notwithstanding the natural market induced competitive pressures experienced by the sector, barriers to entry can still emerge in some segments of the postal market.[50] For that, sector-specific regulatory interventions can be employed to increase market shares of competitors. Access regulation is depending on the understanding of the sectors by regulators (see Box 9). Some regulators think that infrastructure-like type of technical regulations is unnecessary. Another school of thought interprets posts as having a type of network resembling traditional infrastructure, therefore regulations needs to be developed accordingly. If the latter is the case, then a careful examination of the bottlenecks along the chain of production will provide the groundwork for regulatory intervention on access.

150.   Typical examples of bottlenecks along the production chain are represented by P.O. Boxes and address changes. Regulatory intervention might be needed in case the incumbent and the competitors do not come to terms on the sharing of this information. This type of regulation can be also done *ex-ante*, whereby a price for the access is defined beforehand. Similarly, the regulator can intervene when there is an attempt to replicate the distribution network by new entrants. If that is judged to be uneconomical, access to the existing network can be nonetheless guaranteed by determining access prices in advance. To perform that, however, the regulator needs to have highly technical staff capable of providing an independent pricing assessment. In the case of courier services, typical access bottlenecks relate to the retention of the necessary licenses along different steps of the value chain to efficiently provide the service. In fact, in some jurisdictions, is not unusual to have the national monopoly being responsible for license issuance and this does not always encourage transparent practices.

Box 9. Definition of 'access' in postal services

Four different positions are identified and have their own particular regulatory consequences.

- Postal infrastructure is comparable to that of other network industries (e.g. railways or electricity). This implies that technical and competition regulation is comparable to that of the other infrastructure sectors, meaning in particular that a) the regulator should strive obliged to push for unbundling of the infrastructures and that b) the regulator will normally regulate access to the different segments in a 'ex-ante' way.

- The postal network is not an integrated infrastructure but a production chain, in which only certain segments are monopolistic and need to be regulated. This means that there are probably several production chains (mail, parcels, and financial services), each of which has specific characteristics. Regulation here would not be highly technical.

- The postal network is an essential infrastructure (or "essential facility") with a public services or public economy function. In the postal sector, mail delivery may be regarded as an essential infrastructure. Regulators would prevent uneconomical choices, like network duplication.

- Certain segments of the postal sector do not have any monopolistic or essential infrastructure, meaning that no access regulation is necessary.

Source : Adapted from UPU (2004)

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50   The postal chain of production can be separated into five separate segments or activities: a) collection, b) outward sorting, c) transportation, d) inward sorting, and e) final delivery. The analysis of the magnitude of the economies of scale of these activities can reveal the presence of possible monopolistic behaviours of the incumbent (UPU, 2004).

Need for an independent regulatory body

151.   The postal regulator generally differs in terms of the degree of independence it enjoys in comparison with other sectors' regulatory authorities. Currently postal regulators are structured in various ways. They can be a unit within the ministry in charge of posts, or it can also enjoy complete independence from political influence. Most importantly, postal regulators are more effective if separated from the postal operator. Similarly to other sectors, this separation is likely to produce more independent decision making by the operator and a separate autonomous body regulating the sector. If granted proper regulatory function, the independent regulatory body would normally have two core functions:

- To ensure workable competition in the postal market , and

- To guarantee the provision of a universal service in terms of quality, accessibility and affordable price. (UPU, 2004)

The provision of universal service

152.   Universal service, although a major *raison d'être* of postal operators, is subject to various definitions and political interpretations[51]. Some countries include basic financial services as part of those that should be included in the universal access and regulated accordingly. Nonetheless, once a definition is agreed upon, a number of practical challenges will need the regulator's attention. For example, fundamental issues like granting licenses and authorizations as well as the provision of financial support to service delivery will require prompt intervention. Disciplines on public availability of licensing criteria are relevant in the context of the postal sector as licensing can become a hurdle to market entry. Licenses can have restricted validity, carry limits on transferability and include high level requirements[52]. The timing of the license awarding process is also relevant, as in the case of telecoms.

153.   License holders might also be subject to services delivery obligations or financing requirements in order to contribute to universal service. Many countries in the world experience higher-than-profits expenses deriving from the provision of universal service. The resulting financing gap needs therefore to be covered. The way this occurs and the amount of financing required are usually established by the political authority. The regulator defines the costs and methods of implementation. Among the methods employed, there is the definition of a reserved area for the generation of the funds covering universal serve costs, the employment of compensation funds, direct subsidization, etc. Regulatory authorities are key to the proper functioning of these schemes. To encourage competition and create a level playing field, universal service obligations might be submitted to basic rules, such as transparency, non-discrimination and reasonable administration. While these obligations are normally attached to traditional postal service, it is also feared that these could spill over to other sub-sectors, like express delivery, and consequently have detrimental effects on market opening and trade. (WTO, 2005)

154.   A seen, postal sectors and postal and courier services provision are evolving concepts, which moved away from their traditional role of public postal administrations. While fundamental restructuring is

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51 .   The UPU considers the basic services defined in article 10 of the Universal Postal Convention (Beijing Congress, 1999) as the minimum range of services that should form part of the legal definition of the universal postal service for its member countries

52 .   Examples of the criteria required are creditworthiness, good financial standing and reputation, ability to fulfil the universal services obligation, expertise, territorial coverage, good business premises and operational resources, etc. (UPU, 2004)

taking place, there is an increased demand for regulatory discipline. Although postal regulations can use changes that occurred in the telecoms sector as a reference model, it has also some specific features that would need a different approach. For example, as regards cost-based principles for setting tariffs, practices are different and some of these are being managed as per rules decided in the Universal Postal Union (UPU). The question is whether the system, which draws a distinction between developed and developing countries and is not always related to costs, could be transposed in commitments in a trade agreement where a general rule is the MFN obligation[53].

CONCLUDING REMARKS

155.   This study emphasises the importance of competition in promoting trade and maximising the benefits from trade reforms. It shows that pro-competitive reforms lead to an increase in per capita income and that trade agreements can provide incentives for developing countries to reform.

156.   In Part I of the report, an index has been constructed to measure key policies in the area of competition, trade and investment[54]. The index proves useful in analysing cross-country differences in pro-competitive reforms. The main lessons from the analysis are the following:

- Developing countries have many fewer pro-competitive policies than high-income countries. It is not only true when looking at the average index score for regions or income groups, but also at the country level. What is surprising in the database is that there are no convincing examples of "outliers", or countries that despite belonging to one group do not share its characteristics. The results of the index are very consistent across countries. While differences are relatively small when looking at the contribution of competition policy indicators to the index, trade and investment policies explain most of the cross-country variation.

- There is no indication that developing countries have on average improved their pro-competitive policies in the last five years. The only group of countries with a clear trend in the reduction of the index score is the group of high-income countries. This suggests that income divergence is likely to increase and that in the absence of reforms, most of the developing countries cannot expect better trade performance. Among developing countries, the group of low-income countries have, however, on average a lower index score in 2005 as compared to 2001, indicating some progress toward more competitive markets. But they are still the group with the highest index score. Some countries show signs of a clear improvement in their index score and they are the ones that have illustrated themselves as "growth performers", as exemplified by India.

157.   While trade, investment or competition indicators have been separately tested in gravity equations and in cross-country growth regressions, this study shows that a synthetic index of the three policy areas also proves statistically significant and can account for the competitive stance of countries.

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53 .   For country examples of pro-competitive reforms in postal and courier services, refer to TD/TC/WP(2004)51FINAL.

54.   The trade component of the index is based on measures of barriers to trade in goods and as a consequence the quantitative analysis of Part I is limited to trade in goods, while Part II deals with pro-competitive reforms in services sectors.

Moreover, the report provides an empirical verification of the negative impact of uncompetitive policies on trade flows. The index created in Part I is negatively and significantly correlated with bilateral exports and imports of goods. The model shows that a 1% improvement in the pro-competitive stance of a country (that is a 1% decrease of the index) is associated with a 0.33% increase in exports and 0. 76% increase in imports. There is also an additional increase in exports (+0.30%) when partner countries improve their trade, investment and competition policies. These elasticities can be used to assess the gains from pro-competitive reforms both in terms of increased trade and higher income per capita. If developing countries had the same index score as high income OECD countries, they would on average increase their exports by 29.7% and their imports by 36%.

158.   More importantly, this increased trade can lead to higher levels of income. The analysis indicates that pro-competitive reforms can increase income per capita with estimates ranging from +3.5% to +10.5%, depending on how far the country is from best practice levels. There is a linear relationship between pro-competitive reforms and income per capita growth that implies that any effort towards competitiveness can translate into welfare gains.

159.   The conclusion of this analysis is that competition is crucial in realising the gains from trade liberalisation. While studies on the empirical relationship between trade policy indicators and the growth rate of production or trade leave us sometimes with mixed results, the approach followed here – which takes a broader view of competition, investment and trade policies through the concept of "pro-competitive reforms" – offers more convincing evidence. It has been illustrated by the use of the index in a gravity model to show the negative impact of uncompetitive markets on trade flows as well as the potential gains from trade, investment and competition reforms.

160.   The role of pro-competitive reforms in explaining trade flows should not come as a surprise since trade theory has for a long time included competitive markets as a condition for the realisation of the gains from trade liberalisation. However, multilateral trade agreements generally do not mention competition issues, with the exception of the Telecommunications Reference Paper and isolated articles in different WTO agreements. Regional trade agreements, on the contrary, often include competition provisions as part of the "deep integration" that new-generation RTAs promote to increase productivity and growth.

161.   The second part of the study reveals the importance of pro-competitive reforms in key services sectors. It strengthens the findings of the empirical analysis carried out in part one focusing on trade in goods. The analysis illustrates the mutually reinforcing relationship between trade and competition. Pro-competitive reforms are especially important in network industries, where the nature of the sectors tends to favour incumbents over new entrants. Most of these segments are considered strategic for economic, social and human development; hence their liberalisation is sometimes unnecessarily delayed. Pursuing reforms, although costly in the short run, can become crucial to reap the full benefits of trade liberalisation in the long run.

162.   Pro-competitive reforms are mainly domestic reforms, and, as exemplified by the analysis of the Reference Paper presented in Part II, the value added of including these reforms in a trade agreement is not always emerging clearly. As pointed out earlier, reforms can occur in different ways, depending on how private sector participation is promoted and how markets are open to foreign competition. Hence, one can question the idea of having a single model of regulatory principles set in trade agreements to reform such sectors. In addition there might even be drawbacks in having trade negotiations interact with domestic reforms. For example, if countries keep reforms behind schedule so as not to lose negotiating power, the trade negotiation can slow down the process of reforms. Some countries can therefore prefer to keep trade negotiation issues separate from domestic regulatory reform.

163.   On the other hand, some countries do find value in using a trade agreement as leverage for domestic reforms and the experience of the telecoms Reference Paper proves quite successful in:

- Providing a framework to implement regulatory reforms on the basis of commonly agreed principles based on best practices acknowledged internationally;

- Dealing with specific issues where trade and competition are intertwined. For example, when anticompetitive practices are barriers to trade that can challenge the benefits of trade liberalisation;

- Creating incentives for countries to initiate or accelerate reforms, even when they are not signatory of the documents (as seen in the case of the telecoms Reference Paper); and

- Committing to reforms in an international agreement, in particular to lock in reforms and to overcome vested interest.

164.   Our study has no firm conclusion as to the need for pro-competitive reforms to be part of a trade agreement. It is up to countries to find the best way to move forward in their process of reforms. It is acknowledged that there are capacity limitations and that reforms need time to be implemented. Trade agreements can be especially useful when these reforms are not being undertaken in order to provide incentives and serve as an anchor for advancing sound regulatory principles. Experiences of regional economic integration also highlight the benefits of international co-operation in fostering reforms. As emphasised in this study, substantial welfare gains are at stake.

ANNEX I. DATA SOURCES

This annex presents the different variables used in the econometric analysis in Part I of the document and indicates their source. The different components of the index of pro-competitive reforms are briefly described in the main text. Annex II details the methodology used in the antitrust law index, while Annex III gives details on the methodology used in the aggregation of data and creation of the index. The following tables summarize the data used and where they come from.

Table A1. Variables used in the Index of pro-competitive reforms

Variable	Description	Source	Year(s)
Competition law and policy			
Government intervention	Measure of the level of government intervention in the economy using a scale of 1 to 5 (1=liberal; 5=restrictive). The score is based on the rate of government consumption as a percentage of GDP and the share of revenues from state-owned enterprises and property (data from IMF's Government Finance Statistics Yearbook).	Index of Economic Freedom	2001-2005
Price controls	Measure of the relative degree of government control over wages and prices using a scale of 1-5 (1=liberal; 5=restrictive). The data come primarily from the country reports of the Economist Intelligence Unit.	Index of Economic Freedom	2001-2005
Competition law	Numerical measure of competition regimes through the presence of particular laws (Index of antitrust law). The index has a value between 0 (if none of the criteria listed are in the national laws) and 32. It was developed by Nicholson (2004) and the data have been completed for additional countries and years by the Secretariat.	Nicholson (2004) and OECD Secretariat	2001-2005
Licensing procedures	Measure of the number of interactions between a company's employees and external agents to build a standardized warehouse. The data are collected from local construction lawyers, construction firms and public officials.	Doing Business (World Bank)	2005
Licensing costs	This indicator quantifies all the fees related to completing the procedure to legally build a warehouse (expressed in % of the country income per capita). Same sources as the licensing procedures.	Doing Business (World Bank)	2003-2005
Number of procedures to register a business	It includes the number of generic procedures that are officially required to create and operate an industrial or commercial business. The data are collected from local incorporation lawyers and government officials.	Doing Business (World Bank)	2003-2005

Variable	Description	Source	Year(s)
Time to start a business	This variable measures the median duration necessary to complete a procedure, assuming that the minimum time required for each procedure was one day. The data are collected from local incorporation lawyers and government officials	Doing Business (World Bank)	2004-2005
Procedures to register property	The indicator counts the number of property-related interaction for the buyer or the seller, their agents or with external parties. The data are collected from local property lawyers and property registries.	Doing Business (World Bank)	2004-2005
Investment policy			
Investment policy score	This variable examines each country's policies toward foreign investment to ascertain its general investment climate. The primary source for these data was the International Monetary Fund's *Annual Report of Exchange Arrangements and Exchange Restrictions*.	Index of Economic Freedom	2001-2005
Investment protection	This variable captures the strength of minority shareholder protections against directors' misuse of corporate assets for personal gain. It is the average figure taken from the Disclosure Index, Director Liability Index and the Ease of the Shareholder Suits Index. This average is expressed with scores between 0 and 10, higher values suggesting better investor protection. The data were aggregated from a survey of local corporate lawyers.	Doing Business (World Bank)	2005
Trade policy			
Trade policy score	The Trade Policy score is based on the country's weighted average tariff rate and on available information on non-tariff barriers, as well as corruption in the customs service. Data on tariffs come from the World Development Indicators.	Index of Economic Freedom	2001-2005
Time for exports	This variable records the total time to complete necessary procedures for exporting goods, from the contractual agreement to the delivery of goods. The data were collected from freight forwarders, shipping lines, customs brokers and port officials.	Doing Business (World Bank)	2005
Time for imports	This variable records the total time to complete necessary procedures for exporting goods, from the contractual agreement to the delivery of goods. The data were collected from freight forwarders, shipping lines, customs brokers and port officials.	Doing Business (World Bank)	2005

Table A2. Variables used in the econometric analysis

Variable	Description	Unit/Scale	Source	Year(s)
Gravity dataset				
Imports	Bilateral imports of goods from country i to country j	US$000	Comtrade	2001-2005
Exports	Bilateral exports of goods from country i to country j	US$000	Comtrade	2001-2005
Distance	Distance as measured between the most populous cities in country i and country j in accordance with the "great circle" method	Kilometers	CEPII	n/a
Contig	Dummy variable that represents whether country i to country j share a border	1=yes 0=no	CEPII	n/a
Col45	Dummy variable that represents whether country i to country j have had a colonial relationship since 1945	1=yes 0=no	CEPII	n/a
Comlang_off	Dummy variable that represents whether country i to country j share a common official language	1=yes 0=no	CEPII	n/a
Tariff	Average applied bilateral tariff rate between country i and country j	%	TRAINS	2001-2005
GDP_Rep	GDP in country i	US$	World Development Indicators	2001-2005
GDP_Part	GDP in country j	US$	World Development Indicators	2001-2005
SumGDP	The sum (of the log of) GDP in country i and in country j			
Procomp_i	Aggregate index of pro-competitive reforms in country i	Between 0 (lowest) and 1 (highest)	OECD Secretariat	2001-2005
Procomp_j	Aggregate index of pro-competitive reforms in country j	Between 0 (lowest) and 1 (highest)	OECD Secretariat	2001-2005
Procomp_ij_avg	Aggregate index of pro-competitive reforms in country i and country j measured as the log of the average of country i's and country j's individual index	"	"	"
Procomp_ij_diff	Difference in the index of pro-competitive reforms between country i and country j measured as the log of the absolute value of the difference in country i's and country j's individual index divided by the sum of their indexes	"	"	"
Trade_i / Trade_j	Trade component of the pro-competitive reforms index in country i *or* j	"	"	"
Invest_i / Invest_j	Investment component of the pro-competitive reforms index in country i *or* j	"	"	"
Comp_i / Comp_j	Competition component of the pro-competitive reforms index in country i *or* j	"	"	"
Growth dataset				
y	Real GDP per capita (rgdpl in PWT 6.2)	Constant US$ PPP	Penn World Table 6.2	2000-2004
k	Constant investment share of real GDP per capita (ki)	Constant US$ PPP	Penn World Table 6.2	2000-2004
h	School life expectancy (primary to tertiary)	Years	UNESCO	last available
n	Rate of growth of population (calculated from the population variable POP in PWT 6.2)	%	Penn World Table 6.2	2000-2004
Openness	Openness in constant prices (openk in PWT 6.2)	Constant US$ PPP	Penn World Table 6.2	2000-2004

ANNEX II. THE ANTITRUST LAW INDEX: CRITERIA AND RESULTS FOR 82 COUNTRIES

The Antitrust Law Index has been developed by Nicholson (2004). Its overall score is simply the addition of units awarded when the national laws include provisions corresponding to the following list of criteria (the criteria have to be specifically mentioned for units to be awarded):

Table A3. List of criteria of the Antitrust Law Index

General category of antitrust policy for the listed criteria	Criteria listed within the national laws	Score if the criteria are present
Scope	Extraterritoriality	1
Remedies	Fines	1
	Prison sentences	1
	Divestures	1
Private enforcement	Third party initiation	1
	Remedies available to third parties	1
	Third party rights in proceedings	1
Merger notification	Voluntary	1
	Mandatory	1
	Pre-merger	2
	Post-merger	1
Merger assessment	Dominance	1
	Restriction of competition	1
	Public interest	1
	Other	1
	Efficiency	1
Dominance	Limits access	1
	Abusive acts	1
	Price setting	1
	Discriminatory pricing	1
	Resale price maintenance	1
	Obstacles to entry	1
	Efficiency defense	1
Restrictive trade practices	Price-fixing	1
	Tying	1
	Market division	1
	Output restraint	1
	Market sharing	1
	Eliminating competitors	1
	Collusive tendering/bid-rigging	1
	Supply refusal	1
Total		32

Source : Nicholson (2004).

Table A4. Antitrust Law Index from Nicholson (2004)

Country	Antitrust Law Index	Country	Antitrust Law Index
Argentina	17	Macedonia	13
Australia	13	Mexico	13
Belgium	18	Netherlands	7
Brazil	11	New Zealand	10
Canada	13	Norway	11
Chile	4	Panama	10
Chinese Taipei	14	Peru	13
Costa Rica	11	Poland	18
Croatia	15	Romania	18
Czech Republic	14	Serbia and Montenegro	8
Denmark	12	Slovak Republic	16
Estonia	15	Slovenia	14
Finland	11	South Africa	17
France	16	Spain	13
Germany	10	Sri Lanka	10
Indonesia	13	Sweden	16
Ireland	16	Thailand	13
Israel	14	Tunisia	10
Italy	15	Turkey	19
Jamaica	10	Ukraine	20
Japan	9	United Kingdom	9
Kenya	16	United States	21
Korea, Rep.	14	Venezuela	14
Latvia	18	Zambia	14
Lithuania	17		

Source : Nicholson (2004)

Table A5. Antitrust Law Index 2005 (countries added by the Secretariat)

Country	Antitrust Law Index	Country	Antitrust Law Index
Algeria	17	Madagascar	0
Austria	18	Malaysia	0
Bangladesh	0	Mauritius	0
Belarus	13	Morocco	0
Bolivia	9	Nigeria	0
Cameroon	18	Pakistan	17
China	6	Paraguay	0
Colombia	11	Philippines	3
Cote d'Ivoire	12	Senegal	9
Egypt, Arab Rep.	0	Singapore	0
Ethiopia	9	Switzerland	20
Georgia	8	Tanzania	15
Ghana	0	Uganda	0
Hong Kong, China	0	Uruguay	5
Hungary	18	Vietnam	18
India	20	Zimbabwe	13
Jordan	0		

Source : OECD Secretariat, based on national competition laws

ANNEX III. THE INDEX OF PRO-COMPETITIVE REFORMS: CONSTRUCTION OF THE INDICATORS, WEIGHTING METHODOLOGY AND VALUES

This annex describes how the indicators used in the index of pro-competitive reforms were constructed, explains the methodology followed to weight these indicators and provides the detailed values of the index for the 5 years in the panel (2001-2005).

Normalization of the indicators

A first step in the creation of a synthetic index is to normalize the data. It consists in transforming the raw data into a value in a specific range. We have normalized all the data to obtain a score between 0 and 1 where 0 would be the more pro-competitive and 1 the less (this choice is arbitrary). The formula used is:

$$\delta = \frac{d - d_{min}}{d_{max} - d_{min}}$$

where d is the raw data, d_{min} is the minimum value in the entire dataset and d_{max} the maximum value in the dataset (these minimum and maximum values are the same for all years to ensure consistency).

For two categories, we combine the information in a single indicator: "Licenses and permits" is the average of the values obtained for the data on the number of procedures and the cost of each procedure as a percentage of per capita income, while "administrative burdens on startup" is the average of the number of procedures to register a business, the time to start a business and the procedures to register property.

Aggregation methodology

The methodology to aggregate the detailed indicators is based on a statistical approach, the principal component analysis. It consists in weighting each indicator according to the proportion of cross-country variance it explains. Instead of being subjectively chosen, the weights come from the data and factor analysis assigns the largest weights to the indicators that have the largest variation across countries. As noted by Nicoletti et al. (1999), it is especially suited for cross-country comparisons.

Table A6. Weights assigned to the indicators in the index (component score coefficient matrix)

Competition	Government intervention	.062
	Price controls	.154
	Competition law	.032
	Licenses and permits	.120
	Administrative burdens	.172
Investment	Investment policy	.184
	Investment protection	.118
Trade	Trade policy	.179
	Time for export	.193
	Time for import	.198

Table A7. The Index of Pro-Competitive Reforms in 82 countries (2001-2005)

Country	2001	2002	2003	2004	2005
Algeria	0.740	0.649	0.701	0.665	0.729
Argentina	0.409	0.476	0.560	0.544	0.566
Australia	0.297	0.297	0.297	0.297	0.297
Austria	0.330	0.330	0.308	0.330	0.303
Bangladesh	0.743	0.721	0.689	0.697	0.743
Belarus	0.757	0.750	0.779	0.766	0.766
Belgium	0.290	0.244	0.221	0.266	0.243
Bolivia	0.419	0.457	0.480	0.520	0.565
Brazil	0.714	0.714	0.714	0.692	0.669
Cameroon	0.639	0.676	0.691	0.691	0.691
Canada	0.296	0.296	0.289	0.289	0.282
Chile	0.352	0.352	0.383	0.360	0.338
China	0.689	0.689	0.659	0.675	0.667
Chinese Taipei	0.421	0.398	0.405	0.413	0.375
Colombia	0.543	0.551	0.581	0.566	0.599
Costa Rica	0.515	0.492	0.515	0.507	0.529
Cote d'Ivoire	0.574	0.574	0.605	0.581	0.608
Croatia	0.655	0.639	0.617	0.639	0.639
Czech Republic	0.378	0.378	0.423	0.426	0.404
Denmark	0.248	0.233	0.210	0.271	0.245
Egypt, Arab Rep.	0.698	0.692	0.692	0.676	0.663
Estonia	0.209	0.171	0.171	0.202	0.191
Ethiopia	0.822	0.845	0.860	0.732	0.776
Finland	0.292	0.292	0.262	0.295	0.265
France	0.468	0.507	0.446	0.406	0.384
Georgia	0.699	0.691	0.705	0.674	0.710
Germany	0.260	0.260	0.238	0.260	0.232
Ghana	0.662	0.662	0.723	0.692	0.660
Hong Kong, China	0.186	0.186	0.201	0.186	0.186
Hungary	0.388	0.358	0.426	0.426	0.445
India	0.758	0.712	0.673	0.677	0.664
Indonesia	0.585	0.540	0.547	0.635	0.605
Ireland	0.227	0.227	0.204	0.227	0.204
Israel	0.224	0.224	0.284	0.284	0.284
Italy	0.430	0.430	0.408	0.427	0.405
Jamaica	0.403	0.387	0.387	0.401	0.369
Japan	0.331	0.331	0.338	0.338	0.338
Jordan	0.556	0.586	0.623	0.575	0.584
Kenya	0.654	0.632	0.654	0.672	0.650
Korea, Rep.	0.407	0.422	0.408	0.404	0.381
Latvia	0.330	0.322	0.345	0.352	0.330
Lithuania	0.254	0.254	0.291	0.294	0.286
Macedonia	0.570	0.570	0.583	0.591	0.591
Madagascar	0.736	0.736	0.579	0.610	0.580
Malaysia	0.529	0.552	0.530	0.530	0.492
Mauritius	0.538	0.530	0.575	0.583	0.567
Mexico	0.422	0.422	0.430	0.445	0.468
Morocco	0.546	0.592	0.591	0.556	0.602
Netherlands	0.280	0.311	0.266	0.296	0.268
New Zealand	0.165	0.165	0.143	0.143	0.165
Nigeria	0.714	0.707	0.761	0.754	0.811
Norway	0.344	0.344	0.297	0.305	0.302
Pakistan	0.626	0.603	0.626	0.603	0.710
Panama	0.510	0.510	0.488	0.473	0.473
Paraguay	0.546	0.575	0.599	0.621	0.599
Peru	0.408	0.438	0.505	0.505	0.498
Philippines	0.575	0.553	0.531	0.528	0.573
Poland	0.409	0.409	0.477	0.477	0.455
Romania	0.485	0.516	0.561	0.603	0.531
Senegal	0.648	0.648	0.610	0.556	0.556
Serbia and Monteneg	0.765	0.765	0.765	0.765	0.751
Singapore	0.153	0.161	0.153	0.153	0.150
Slovak Republic	0.425	0.455	0.462	0.405	0.392
Slovenia	0.552	0.575	0.498	0.430	0.404
South Africa	0.450	0.442	0.420	0.442	0.421
Spain	0.420	0.381	0.328	0.347	0.305
Sri Lanka	0.486	0.478	0.524	0.522	0.492
Sweden	0.281	0.235	0.212	0.235	0.212
Switzerland	0.348	0.340	0.348	0.340	0.348
Tanzania	0.797	0.751	0.759	0.743	0.819
Thailand	0.356	0.356	0.461	0.446	0.531
Tunisia	0.568	0.590	0.613	0.610	0.656
Turkey	0.435	0.511	0.541	0.508	0.486
Uganda	0.756	0.702	0.687	0.687	0.687
Ukraine	0.668	0.668	0.683	0.681	0.651
United Kingdom	0.295	0.295	0.273	0.295	0.234
United States	0.220	0.242	0.220	0.220	0.242
Uruguay	0.371	0.461	0.469	0.394	0.402
Venezuela	0.690	0.767	0.751	0.851	0.829
Vietnam	0.829	0.000	0.775	0.750	0.741
Zambia	0.548	0.587	0.678	0.678	0.633
Zimbabwe	0.899	0.908	0.946	0.969	0.901

Table A8. Average index of pro-competitive reforms by region (2001-2005) and standard deviation

Region	Number of countries	2001	2002	2003	2004	2005
Index						
East Asia & Pacific	6	0.594	0.585	0.584	0.594	0.601
Europe & Central Asia	15	0.495	0.497	0.522	0.521	0.509
Latin America & Caribbean	13	0.485	0.508	0.528	0.529	0.531
Middle East & North Africa	5	0.622	0.622	0.644	0.616	0.647
South Asia	4	0.653	0.628	0.628	0.625	0.652
Sub-Saharan Africa	14	0.674	0.671	0.682	0.671	0.669
High income OECD	20	0.311	0.309	0.286	0.300	0.283
High income non OECD	5	0.307	0.309	0.308	0.293	0.280
Standard deviation						
East Asia & Pacific		0.145	0.144	0.104	0.102	0.083
Europe & Central Asia		0.174	0.177	0.170	0.165	0.168
Latin America & Caribbean		0.111	0.115	0.108	0.128	0.126
Middle East & North Africa		0.081	0.042	0.044	0.048	0.051
South Asia		0.109	0.098	0.064	0.069	0.097
Sub-Saharan Africa		0.119	0.117	0.125	0.117	0.122
High income OECD		0.074	0.079	0.076	0.067	0.063
High income non OECD		0.154	0.157	0.127	0.113	0.100
All countries	82	0.184	0.187	0.187	0.181	0.189

Table A9. Average index of pro-competitive reforms by income group (2001-2005) and standard deviation

Income group	Number of countries	2001	2002	2003	2004	2005
Index						
Low income	15	0.718	0.707	0.708	0.693	0.703
Lower middle income	22	0.588	0.589	0.610	0.607	0.616
Upper middle income	20	0.438	0.451	0.472	0.473	0.462
High income OECD	20	0.311	0.309	0.286	0.300	0.283
High income non OECD	5	0.307	0.309	0.308	0.293	0.280
Standard deviation						
Low income	15	0.095	0.093	0.096	0.095	0.093
Lower middle income	22	0.119	0.112	0.100	0.094	0.091
Upper middle income	20	0.114	0.128	0.121	0.134	0.132
High income OECD	20	0.074	0.079	0.076	0.067	0.063
High income non OECD	5	0.154	0.157	0.127	0.113	0.100
All countries	82	0.184	0.187	0.187	0.181	0.189

ANNEX IV. METHODOLOGICAL CONSIDERATIONS AND RESULTS OF THE ESTIMATION OF THE GRAVITY MODEL AND INCOME PER CAPITA EQUATION

The gravity model used in the analysis has the following general form:

$$\ln X_{ijt} = \alpha_0 + \alpha_1 \ln dist_{ij} + \alpha_2 contig_{ij} + \alpha_3 col45_{ij} + \alpha_4 comlang\_off_{ij} + \alpha_5 \ln GDP_{it} + \alpha_6 \ln GDP_{jt}$$
$$+ \alpha_7 procomp_{ti} + \alpha_8 procomp_{jt} + \beta_i + \beta_j + \beta_t + \varepsilon_{ijt}$$

where X_{ijt} can be either imports or exports. The other variables are described in Annex I. Ideally, the equation includes country and time invariant fixed effects, as shown above. But they are not included in all the specifications, depending on the estimation technique employed.

Different regressions methods have been used in the analysis. First, a pooled OLS regression is provided. It already shows a negative and significant coefficient for the two indexes of pro-competitive reforms. However, in the absence of fixed effects, the econometric model cannot control for the heterogeneity of exporters and importers and the estimation is potentially biased (Cheng and Wall, 2005). As our pro-competitive reforms index is country specific, the addition of fixed effects is problematic since country fixed effects are collinear with the indexes. Also, the assumption of unobserved effects are uncorrelated with the regressors (and in particular the PCR index) is likely to be rejected. We deal first with this issue by creating a "bilateral" PCR index which is specific to country pairs. We used two different country pair indexes, the first one being calculated as the average of the index of each country and second one as the difference between them (in absolute terms). We can test these two variables in an econometric model better specified, with country and year fixed effects.

To test the indexes of pro-competitive reforms individually and to distinguish between the role of the reporter's and partner's market reforms, we then turn to more sophisticated regression techniques that allow estimation at the same time of the country individual variables and fixed or random effects. We use a Heckman two-step estimation and a Hausman-Taylor regression which use as instruments some of the variables in the model to estimate the endogenous variables. The Hausman-Taylor regression and its application to the gravity model are discussed in Egger (2005). We used procomp_i and procomp_j as the time varying endogenous variables, and distance and the geographical dummies as time invariant exogenous variables. The Heckman selection model and its application to gravity regressions is discussed in Helpman and al. (2006).

The results of the regressions are in Table 1 in the main text and additional regressions can be found in Table A10 below.

Table A10. Additional regression results from the gravity model

	Dependent variable: Exports				Dependent variable: Imports			
	Pooled OLS	Time-varying fixed effects	Heckman two-step estimation	Hausman-Taylor regression	Pooled OLS	Time-varying fixed effects	Heckman two-step estimation	Hausman-Taylor regression
Distance	-1.084***	-1.407***	-1.375***	-1.241***	-0.998***	-1.227***	-1.138***	-1.158***
	(-84.23)	(-82.08)	(-57.42)	(-29.89)	(-82.58)	(-74.33)	(-16.18)	(-28.13)
Contig	1.033***	0.474***	0.472***	0.891***	0.943***	0.445***	0.598***	0.792***
	(14.11)	(5.67)	(4.90)	(4.46)	(13.19)	(5.69)	(2.14)	(3.98)
Col45	0.723***	1.018***	0.967***	1.292***	0.657***	0.971***	0.892***	1.193***
	(7.97)	(10.93)	(6.15)	(4.20)	(8.29)	(11.55)	(1.97)	(3.89)
Comlang_off	0.835***	0.793***	0.672***	0.701***	0.716***	0.831***	0.600***	0.606***
	(23.02)	(20.08)	(12.86)	(7.84)	(20.70)	(21.56)	(3.94)	(6.90)
GDP_Rep	1.162***			0.966***	0.991***			0.846***
	(161.47)			(56.28)	(150.77)			(49.92)
GDP_Part	0.936			0.779***	1.134***			0.926***
	(137.42)			(45.48)	(168.41)			(54.96)
SumGDP		0.858***	0.234***			0.983***	0.228***	
		(22.44)	(3.30)			(27.53)	(1.09)	
Procomp_i	-0.763***		-1.175***	-0.285***	-0.483***		-0.371***	-0.533***
	(-25.35)		(-18.88)	(-3.64)	(-16.22)		(-4.61)	(-6.81)
Procomp_j	-0.452***		-0.049	-0.275***	-0.611***		-0.380***	-0.045
	(-14.55)		(-1.13)	(-3.39)	(-21.81)		(-6.28)	(-0.56)
Procomp_ij_avg		-1.700***				-0.933***		
		(-5.86)				(-3.32)		
Procomp_ij_diff		-0.008				-0.012		
		(-0.60)				(-0.93)		
Number of obs.	21347	21322	21347	21347	22055	22029	22055	22055
R-squared	0.7438	0.8314	n/a	n/a	0.7597	0.8315	n/a	n/a

Notes: The list of the variables is given in Annex I. The constants, time and country fixed effects are not reported in the table. All regressions were run with robust standard errors under heteroskedastic conditions (when relevant). Values of t-statistics are in parentheses (z-values for the Hausman-Taylor regressions). Values marked (***), (**), and (*) are significant at the 0.1%, 1% and 5% levels, respectively.

The growth equation estimated in Part I in relation to the gravity model is based on the augmented Solow model from Mankiw, Romer and Weil (1992). This is a derivation of a Cobb-Douglas production function where the left-hand variable is real GDP per capita. The specification for country *i* is:

$$\ln y_{it} = \beta_0 + \beta_1 \ln k_{it} + \beta_2 \ln h_i + \beta_3 (n_{it} + g + \delta) + \beta \ln open_{it} + \varepsilon_{it}$$

where y_{it} is the PPP-adjusted real GDP per capita

k_{it} is the share of investment in real GDP

h_i is human capital, measured in years as the school life expectancy (due to data availability this variable is constant across all years)

n_{it} is the rate of growth of population (g and δ are respectively the rate of growth of technological progress and the depreciation rate; they are assumed to be constant and the same across countries and hence are dropped from the regression)

$open_{it}$ is the trade openness ratio (imports plus exports divided by GDP)

Table A11. Results of the growth regression

Dependent variable: real GDP per capita (*y*)	OLS	IV	GMM
ln k	0.149***	0.247***	0.194***
	(10.63)	(51.17)	(25.82)
ln h	2.506***	2.023***	2.289***
	(22.57)	(71.78)	(57.34)
n	-9.191**	-0.136	-5.340***
	(-3.01)	(-0.17)	(-6.50)
Open	0.297***	1.372***	0.790***
	(6.12)	(33.35)	(10.28)
Number of obs.	343	343	343
R-squared	0.81	0.52	0.75

Notes: The regressions were run with robust standard errors under heteroskedastic conditions. Values of t-statistics are in parentheses (z-values for the GMM estimation). Values marked (***), (**), and (*) are significant at the 0.1%, 1% and 5% levels, respectively.

Table A.11 presents the results of three types of regressions of the GDP per capita equation. First, a simple OLS regression. Then, in the second estimation, openness is instrumented by the variables from the gravity model. A higher coefficient is obtained for the trade openness ratio. The third regression is a Generalised Method of Moments estimation to also address the endogeneity issue. As in the IV regression, trade is instrumented by the variables from the gravity equation. The coefficient for the trade openness ratio is also higher but less than in the case of the two-step IV regression. Following Frankel and Rose (2002), we adopt a conservative approach and use the smaller coefficient from the OLS regression to assess the potential income gains from increased trade. It means that the results from the simulation presented in section 4 of Part I are likely to underestimate the potential gains from pro-competitive reforms.

ANNEX V. COMMITMENTS IN BASIC TELECOMMUNICATIONS OF WTO MEMBERS

Table A12. Summary of WTO members' commitments in basic telecommunications and market status in 2004

Country	WTO commitments		Market status in 2004					
			Competition in different markets				Independent Regulator	
	Invokes Ref Paper--at least in part	*Phase-out of Monopoly*	*local*	*long distance*	*international*	*mobile*	*Yes/No*	*Year of Establishment*
Albania	√	√	C	P	P	P	√	1998
Angola			C	C	C	C		1999
Antigua and Barbuda	√	√	M		M	C		
Argentina	√		C	C	C	C	√	1999
Armenia	√	√	M	M	M			
Australia	√	√	C	C	C	C	√	1997
Austria	√		C	C	C	C	√	1997
Bahrain			C		C		√	2002
Bangladesh			C	C	M	P	√	2002
Barbados	√	√	M		P	P	√	2001
Belize	√	√					√	1999
Bolivia	√	√	M	M	M		√	1995
Brazil			C	C	C	C	√	1997
Brunei Darussalam	√		P	P	P			2003
Bulgaria	√	√	P	P	P	C	√	2002
Burundi			C	C	C	C	√	1997
Cambodia	√	√	P	P	P	P		
Cameroon			M	M	M	C		1998
Canada	√	√	C	C	C	C	√	1976
Central African Republic			M	M	M			
Chad			M	C	M			1998
Chile	√		P	C	C	M		1997
China	√		P	P	P	P		
Chinese Taipei	√							
Colombia	√	√	P	C	C		√	1994
Congo			C	C	P	P	√	2002
Costa Rica			M	M	M	M	√	1963
Côte d'Ivoire	√	√	P	P	P	C	√	1995
Croatia	√	√	C	C	C	C	√	2000
Cuba			M	M	M	M		

Country	WTO commitments		Market status in 2004					
	Invokes Ref Paper--at least in part	*Phase-out of Monopoly*	Competition in different markets				Independent Regulator	
			local	*long distance*	*international*	*mobile*	*Yes/No*	*Year of Establishment*
Cyprus			C	C	C		√	2002
Czech Republic	√	√	C	C	C	C	√	2000
Djibouti			M	M	M			
Dominica	√		M	M	M	P	√	2000
Dominican Republic	√		C	C	C	C	√	1998
Ecuador			P	P	P	P	√	1995
Egypt	√	√	M	M	M	P	√	1998
El Salvador	√		C	C	C	C	√	1996
Estonia	√	√	C	C	C	C	√	1998
European Communities	√		C	C	C	C		
Fiji			M	M	M			
Finland	√		C	C	C	C	√	1988
FYR Macedonia	√	√	M	M	M	M	√	2005
Gabon			M	C	C	C	√	2001
Gambia			M	M	M	M	√	2004
Georgia	√		P	P	C	P	√	2000
Ghana	√		P	P	P	P	√	1997
Grenada	√	√		P		C	√	2001
Guatemala	√		C	M	C	C	√	1996
Guinea			M	M	M	C	√	1999
GuineaBissau			P	P	P			1992
Guyana								
Haiti			P	P	P			1969
Honduras			M	M	M		√	1996
Hong Kong, China	√							
Hungary	√	√	C	C	C	P	√	1999
Iceland	√		C	C	C	C	√	1997
India	√		C	C	C	C	√	1997
Indonesia	√	√	P	P	P	P	√	2003
Israel	√	√	M	M	C	C	√	2002
Jamaica	√	√	C	C	C	C	√	1995
Japan	√		C	C	C	C		
Jordan	√	√	P	P	P	C	√	1995
Kenya	√	√	P	P	P	C	√	1999
Korea	√		C	C	C	C	√	1997
Kuwait			M		M			
Kyrgyz Republic	√	√	C	C	C	C	√	1997
Latvia	√	√	C	C	C		√	2001
Lesotho			P	P	P	P	√	2000

| Country | WTO commitments | | Market status in 2004 | | | | | |
| | | | Competition in different markets | | | | Independent Regulator | |
Country	*Invokes Ref Paper--at least in part*	*Phase-out of Monopoly*	*local*	*long distance*	*international*	*mobile*	*Yes/No*	*Year of Establishment*
Liechtenstein								1999
Lithuania	√	√	C	C	C	C	√	2000
Macau, China								
Madagascar			M	M	C	C	√	1997
Malawi			M	M	P			1998
Malaysia	√		C	C	C	C	√	1998
Maldives							√	2003
Mali			P	P	P	C	√	1999
Malta			C		C	C	√	1997
Mauritania			M	C	C	C	√	1999
Mauritius		√	C		C	C	√	2002
Mexico	√		C	C	C	C	√	1996
Moldova	√	√	C	C	C	C	√	2002
Mongolia			P	P	C	C	√	2000
Morocco	√	√	M	M	M	M	√	1997
Mozambique			M	M	M		√	1992
Myanmar			M	M	M	P		
Namibia			M	M	M	M	√	1992
Nepal	√	√	P	P	P	P	√	1998
New Zealand	√		C	C	C	C	√	2001
Nicaragua			C	C	C		√	1995
Niger			M	M	M		√	2004
Nigeria			C	P	P	C	√	1992
Norway	√		C	C	C	C	√	1987
Oman	√	√	M	M	M	M	√	2002
Pakistan	√	√	C	C	C	C	√	1996
Panama		√	C	C	C	M	√	1996
Papua New Guinea	√	√	M	M	M	M		1997
Paraguay			M	M	M	C	√	1995
Peru	√	√	C	C	C		√	1994
Philippines	√		C	C	C	C	√	1979
Poland	√	√	C	C	C	C	√	2000
Qatar			M	M	M	M	√	2004
Romania	√	√	C	C			√	2002
Rwanda			C	C			√	2001
Saint Kitt's and Nevis			P	P	P	P	√	2000
Saint Lucia			P	C	P	P	√	2000
Senegal	√	√					√	2001
Sierra Leone			M	M	P			

| Country | WTO commitments | | Market status in 2004 | | | | | |
| | Invokes Ref Paper--at least in part | Phase-out of Monopoly | Competition in different markets | | | | Independent Regulator | |
			local	*long distance*	*international*	*mobile*	Yes/No	Year of Establishment
Singapore	√		C		C	C	√	1992
Slovak Republic	√	√	C	C	C	C	√	2000
Slovenia			C	C	C	C	√	2001
Solomon Islands			M	M	M			
South Africa	√	√	C	C	C	M	√	2000
Sri Lanka	√	√	P	C	P	P	√	1991
St. Vincent			C	C	C	C	√	2001
Suriname	√	√	M	M	M	M		1998
Swaziland			M	M	M	M		
Sweden	√		C	C	C	C	√	1992
Switzerland	√		C	C	C	P	√	1992
Thailand			P		M		√	2004
Togo			P	M	P	C	√	1998
Trinidad and Tobago	√	√	M		P	M	√	2004
Tunisia			M	M	M	M	√	2001
Turkey		√	P	C	C	C	√	2000
Uganda	√	√	P	P	P	P	√	1997
United Arab Emirates			P	P	P	P	√	2004
United States	√		C	C	C	C	√	1934
Uruguay			M	M	P	M		2004
Venezuela	√	√	C	C	C	C	√	1991
Zambia			M	M	M	M		1994
Zimbabwe			C	P	P		√	2000

Source: ITU World Telecommunication Regulatory Database 2004; WTO.
Key: M=Monopoly; D=Duopoly; P=Partial competition; C=Full competition

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