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Ten Years of Product Market
Reform in OECD Countries:
Insights from a Revised
PMR Indicator

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ABSTRACT/RESUMÉ

Ten years of product market reform in OECD countries – insights from a revised PMR indicator

This paper describes patterns and developments of regulation that potentially affect product market competition in OECD countries over the past decade. It uses the 2008 update and revision of the OECD indicators of product market regulation (PMR) that integrate to a larger extent than in the past information on sector-specific regulation and adapt a simpler and more transparent aggregation technique. The results show that OECD countries have extensively liberalised product markets over the past ten years and – as a consequence - convergence of regulation across OECD countries can be observed. However, reforms appear to have slowed in the most recent period (2003–2008) as compared with the earlier period (1998–2003). Easing of product market regulation appears to have been driven to a considerable extent by reforms in sector-specific regulation, notably as regards the gas, electricity and telecommunications markets. Countries appear also to have followed consistent reform approaches. However, scope for further reform remains, especially as regards controls of governments over businesses, and as regards certain sectors such as professional services and retail trade.

JEL Classification: K2, L5

Keywords: Indicators of Product Market Regulation

Dix ans de réformes sur le marché des produits dans les pays de l'OCDE - un aperçu sur la base d'un indicateur RMP révisé

Ce papier décrit les évolutions observées en matière de réglementation potentiellement entravant le jeu de la concurrence sur les marchés de produits des pays de l'OCDE au cours des dix dernières années. On utilise une version actualisée et révisée des indicateurs de réglementation des marchés de produits (RMP) qui intègre dans des proportions plus vastes que par le passé des informations sur les réglementations sectorielles et utilise une technique d'agrégation plus simple et transparente. D'après les résultats, les pays de l'OCDE ont considérablement libéralisé leurs marchés de produits depuis dix ans et – par conséquence – la convergence des réglementations peut être observée. Cependant, le rythme des réformes semble avoir ralenti ces dernières années (de 2003 à 2008) par rapport à la période précédente (de 1998 à 2003). Sur l'ensemble de la période, les réformes de la réglementation semblent avoir reposé considérablement sur la réforme des réglementations sectorielles, notamment dans les marchés du gaz, de l'électricité et des télécommunications. Les pays semblent avoir également introduit des réformes d'une façon cohérente. Cependant, il existe encore des marges de manoeuvre considérables, notamment en termes du contrôle exercé par l'Etat, et dans quelques secteurs, tels que les services professionnels et le commerce de détail.

JEL Classification: K2, L5

Mots-clés: Indicateurs de réglementation des marchés de produits

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TABLE OF CONTENTS

ABSTRACT/RESUMÉ.....	2
TEN YEARS OF PRODUCT MARKET REFORM IN OECD COUNTRIES – INSIGHTS FROM A REVISED PMR INDICATOR.....	5
By	5
1. Introduction.....	5
2. The OECD Indicators of Product Market Regulation: scope and perspectives	8
2.1. The economy-wide and sectoral regulation indicators.....	8
2.2. A revised and updated PMR indicator system	9
3. Patterns and trends in product market regulation in OECD countries until 2008.....	11
3.1 Countries’ current regulatory stance	11
3.2 Reform of product market regulation since 1998	15
3.3. The sources of regulatory reform.....	18
3.3. Complementarities and consistency in product market regulation	22
3.5. Potential for future reform	24
Outlook.....	27
ANNEX.....	28
A1. The 2008 round of PMR indicator revision.....	28
A1.1. Improved data collection and processing.....	29
A1.2. Refining individual low-level indicators.....	30
A1.3. On the revision of the weighting technique	30
A1.4. Integration of previously separate indicators	31
A1.5. The impact of the revisions on the PMR indicator	34
A2. Detailed tests of differences in regulatory environments across countries and over time.....	37
A3. Schemata of the low-level indicators.....	40
A3.1. State Control	40
A3.2. Barriers to Entrepreneurship	45
A3.3. Barriers to Trade and Investment.....	54
BIBLIOGRAPHY.....	57

Tables

1. Significant changes in integrated PMR over time.....	16
2. Patterns of regulatory reforms between 1998 and 2008.....	19
3. The role of sectoral regulation in differentiating countries	21
4. Reform complementarities between regulatory areas	23
A.1. Changes in significant cross-country differences in PMR over time	38
A.2. The impact of integrating additional sector information, 2008	39
A3.1. Integrated PMR indicator, low-level indicator: scope of public enterprise sector	40
A3.2. Integrated PMR indicator, low-level indicator: Government involvement in network sector	42
A3.3. Integrated PMR indicator, low-level indicator: direct control over business enterprises.....	42

A3.4. Integrated PMR indicator, low-level indicator: price controls	43
A3.5. Integrated PMR indicator, low-level indicator: use of command and control regulation	44
A3.6. Integrated PMR indicator, low-level indicator: licenses and permits system.....	45
A3.7. Integrated PMR indicator, low-level indicator: communication and simplification of rules and procedures	46
A3.8. Integrated PMR indicator, low-level indicator: administrative burdens for corporations.....	47
A3.9. Integrated PMR indicator, low-level indicator: administrative burdens for sole proprietor firms..	47
A3.10. Integrated PMR indicator, low-level indicator: sector-specific administrative burdens	48
A3.11. Integrated PMR indicator, low-level indicator: legal barriers to entry.....	49
A3.12. Integrated PMR indicator, low-level indicator: antitrust exemptions for public enterprises or state-mandated actions	50
A3.13. Integrated PMR indicator, low-level indicator: barriers in network sectors.....	51
A3.14. Integrated PMR indicator, low-level indicator: barriers in services.....	53
A3.15. Integrated PMR indicator, low-level indicator: barriers to FDI	54
A3.16. Integrated PMR indicator, low-level indicator: tariff trade barriers.....	54
A3.17. Integrated PMR indicator, low-level indicator: discriminatory procedures	55
A3.18. Integrated PMR indicator, low-level indicator: regulatory barriers	56

Figures

1. The tree structure of the integrated PMR indicator	10
2. Aggregate PMR scores, 2008.....	12
3. PMR scores by domain, 2008.....	13
4. Aggregate regulation (integrated PMR) and its dispersion across countries over time	15
5. Development of aggregate product market regulation since 1998	16
6. Convergence in aggregate PMR.....	17
7. Sources of reform in product market regulation.....	20
7. Sources of reform in product market regulation.....	21
8. Number of reformed regulatory areas and the overall extent of regulatory reform	22
9. Policy consistency, 2008	24
10. Distance from best practice regulation, 2008.....	26
A.1. The tree structure of the old PMR indicator	28
A.2 The tree structure of the NMR indicators.....	32
A.2 The tree structure of the NMR indicators.....	33
A.3 The tree structure of the.....	33
A.4 Comparing the old PMR with the revised	35
A.5 Impact of the steps of revision on the PMR indicator, 1998, 2003, 2008	36

Boxes

Box 1. Product market regulation and economic growth	7
Box 2: The meaning of the low-level indicators	10
Box 3: Statistical analysis of differences in regulation across countries and over time.....	14
Box 4. Factors influencing product market reform	18

TEN YEARS OF PRODUCT MARKET REFORM IN OECD COUNTRIES – INSIGHTS FROM A REVISED PMR INDICATOR¹

By

Anita Wöelfl, Isabelle Wanner, Tomasz Kozluk and Giuseppe Nicoletti

1. Introduction

1. More intensive competition in product markets tends to boost economic growth: empirical studies show that competitive product markets force companies to be more efficient and to increase productivity, a key component of growth in GDP per capita. Through a number of different mechanisms, including entry by new firms and changes in real wages, stronger competition in product markets may also have a positive effect on employment, another key component of growth in GDP per capita (see Box 1). In light of such potential positive effects of product market reforms, many OECD countries have liberalised and reformed network sectors, have facilitated the start-up of firms by reducing administrative burdens, and have opened up domestic markets to foreign products, firms or professionals over the past twenty years.

2. Since the end of the 1990s, the OECD has been constructing a system of indicators to measure ongoing developments in product market regulation across OECD countries, the so-called PMR indicators.² These indicators have been used extensively in the analysis of regulatory policies in OECD countries. They are used both within the OECD, notably for identifying policy priorities in the context of *Going for Growth* and OECD Country Surveys (OECD, 2006a-d)), as well as outside, in particular in economic research of the impact of regulation on economic performance (Box 1). The PMR indicators were last updated to reflect policy settings in 2003.

3. This paper describes patterns and developments of regulation that affect product market competition in OECD countries over the past decade. The paper uses the latest updates of the OECD system of indicators of product market regulation (PMR) for 2008.³ In this update, the PMR indicators have also been substantially revised, in particular integrating information on regulation in particular sectors to a much larger extent than in the past and adapting a simpler and more transparent technique for

¹ OECD Economics Department, 2 rue André Pascal, 75775 Paris Cedex 16, France. Corresponding author is Anita Wöelfl (Email: anita.woelfl@oecd.org). The authors would like to thank several colleagues in the Economics Department and in other OECD Directorates for their useful comments and contributions to this paper and the indicators on which it is based. Particular thanks go to Jens Arnold and Paul Conway for their help with the indicators, Jørgen Elmeskov, Klaus Schmidt-Hebbel and Jean-Luc Schneider for useful comments, as well as Irene Sinha for secretarial support. The authors would like also to acknowledge the contribution of respondents to the OECD Regulatory Questionnaire in the national administrations of member countries.

² See Nicoletti *et al.* (1998), OECD (1999), Conway *et al.* (2005), Conway and Nicoletti (2006). The data and indicators are available at www.oecd.org/eco/pmr.

³ At the date of printing, the necessary data to construct the PMR indicator were only available for 27 countries, excluding Ireland, Greece and the Slovak Republic.

aggregating detailed information to synthetic indicators of regulatory stance (see the annex for a detailed description of the revision of the PMR indicators).⁴

4. The following main conclusions emerge from the analysis:
- OECD countries have extensively liberalised product markets over the past ten years and – as a consequence - convergence of product market regulation across OECD countries can be observed. However, the aggregate picture masks differences in regulatory reform across countries as well as over time.
 - Reforms appear to have slowed in the most recent period (2003-2008) as compared with the earlier period (1998-2003). While countries tend to converge towards the policy stance of the most liberalised countries in both periods, this tendency is less pronounced in the more recent period.
 - Over the whole period, easing of product market regulation appears to have been driven to a considerable extent by reforms in sector-specific regulation, notably as regards the gas, electricity and telecommunications markets. This underlines the importance of focusing on sector-specific regulation and individual regulatory areas in policy analysis.
 - Overall, countries appear to follow consistent regulatory approaches, *i.e.* in which different regulatory policies are linked with each other. Most countries appear also to have changed their regulatory environments in a consistent way over the past ten years. More specifically, countries that substantially eased barriers to competition throughout the whole period introduced reforms in a wide range of different regulatory areas or sectors.
 - Despite ten years of liberalisation of regulation, considerable scope for further reform remains, especially as regards reducing controls of governments over businesses, in terms of public ownership and other forms of direct control over firm decisions.
 - Finally, though there has been much progress in reform in certain sectors, there is considerable scope for reform in others such as professional services and retail trade.

⁴ The choice of the revised weighting technique was based on a comprehensive sensitivity analysis that was prepared by the Joint Research Center of the European Commission.

Box 1. Product market regulation and economic growth

From the theoretical and empirical literature, two main channels can be distinguished through which pro-competitive product market regulation may spur economic growth. These channels correspond to the two main building blocks of GDP: productivity and employment.⁵

First, empirical studies show that competitive product markets force companies to be more efficient and to increase labour or multi-factor productivity, for instance by adopting new technologies and being innovative.⁶ Nicoletti and Scarpetta (2003), for instance, show that countries in which public ownership in the business sector is limited and barriers to entry are low are more successful at improving multi-factor productivity growth (MFP) than countries with stringent anti-competitive regulation. More generally, regulation that limits competitive pressures tends to lower long-run productivity and it appears that at the aggregate level the burden of regulation is greater the further away a given country is from best-practice technology. Conway *et al.* (2006) look at the knock-on effects of product market regulation in some sectors on other sectors in terms of the regulatory burden that firms face indirectly via the use of intermediate inputs from highly regulated sectors. They highlight the detrimental effect from regulation in non-manufacturing sectors for labour productivity not only in these sectors but also for sectors using ICT. Finally, Arnold *et al.* (2008) analyse the regulation-productivity link at the firm-level - complementing thereby the existing industry-level analyses. Their results suggest that burdensome regulation have been particularly harmful for the ability of the economy to allocate resources to the most efficient firms and for productivity growth in firms operating close to the technological frontier.

Second, theoretical and empirical studies suggest that easing anti-competitive product market regulation may have a positive effect on employment (*e.g.* Blanchard and Giavazzi (2003), Nicoletti and Scarpetta (2005), Griffith and Harrison (2004), Griffith *et al.* (2007)). Reducing barriers to entry would curb market power of incumbents and make entry of competitors possible, which again would raise the activity level and thus labour demand. Moreover, more intensive competition also lowers product market rents and, to the extent that these rents are partly appropriated by workers with bargaining power, decreases wage premia helping to close the gap between wages and productivity (Fiori *et al.* 2007; Griffith *et al.* 2007). Finally, competition puts downward pressure on prices of goods and services thereby raising real wages, which stimulates labour supply. In addition to these mechanisms, the results in Bassanini and Duval (2006) highlight the role of product market regulation as a burden on labour force participation and employment opportunities for female workers. Finally, some empirical evidence (*e.g.*, Fiori *et al.* (2007)) suggests that product market regulation is a political complement to labour market regulation since easing product market regulation may have additional positive effects on employment by inducing job-friendly reforms of labour market institutions, because lower market power by firms induces lower bargaining power by workers.⁷

5. The paper is structured as follows: Section 2 summarises the development of the PMR indicators over the past ten years and briefly describes the most recent revisions of the PMR indicator system. Section 3 provides an overview of the patterns of product market regulation in OECD countries since 1998 based on the revised and updated PMR indicator (henceforth called "integrated PMR indicator"); it highlights the main drivers of reforms that have been undertaken and points to the potential for future

⁵ For an overview of the channels through which less restrictive product market regulation may induce positive growth effects and for further references to empirical work analysing this link, see Aghion and Griffith (2005), Crafts (2006), Nicoletti and Scarpetta (2006), Schiantarelli (2005), Høj *et al.* (2007), Conway *et al.* (2006) and Arnold *et al.* (2008).

⁶ OECD empirical analysis has found little support for the notion that excessive competition can undermine the incentives to innovate, possibly because most OECD countries have protection regimes in place for intellectual property to ensure a return on innovation for the innovator.

⁷ Notably, lower product market rents undermine incentives to join unions and fight for labour market regulations that increase bargaining power of insiders. Also, the positive impacts of product market deregulation in terms of an increase in both, employment opportunities as well as average real wages, may weaken opposition to labour market reforms (Høj *et al.* (2006)). Another mechanism is by reducing "wait-unemployment" (OECD, 2003, see in this regard also Burda, 1988).

reforms. The annex goes more into detail on the indicator construction and revision and provides the results of additional statistical analyses of differences in regulatory approaches across countries.

2. The OECD Indicators of Product Market Regulation: scope and perspectives

6. The basic idea of the OECD system of economy-wide and sectoral indicators of product market regulation is to turn qualitative data on laws and regulations that may affect competition into quantitative indicators. What distinguishes these indicators from indicators that have been developed by other organisations is primarily their bottom-up approach based on raw information about existing laws and regulations. The bottom-up approach makes it possible to trace the indicator scores back to individual policies. Furthermore, the data on which the indicators are based are mainly derived from a survey of member countries, with only a small fraction being based on external data sets, thereby guaranteeing a high level of comparability across countries. The indicators are policy focused and not based on opinion surveys that would reflect subjective assessments of market participants. They mostly measure regulations that are potentially anti-competitive in areas where competition is viable, and generally do not reflect market outcomes. Finally, the indicators are subject to peer review by the national administrations of OECD member countries.

2.1. The economy-wide and sectoral regulation indicators

7. In 1998, the OECD Indicator of Product Market Regulation (the “PMR indicator”) was developed, measuring regulation at the economy-wide level. It covers general regulatory issues in fields such as public control and price controls, legal and administrative barriers to entry, and barriers to trade and investment. It covers equally some industry-specific regulatory policies, notably in air and rail passenger transport, rail and road freight, telecommunications and retail distribution. This information was grouped under three broad domains: 'state control', 'barriers to entrepreneurship' and 'barriers to trade and investment'. Including the current round, the PMR indicator was computed with data for 1998, 2003 and 2008.

8. In parallel with the construction of the economy-wide PMR indicator, the OECD developed a set of sectoral indicators covering several non-manufacturing sectors (“NMR indicators”), covering network industries such as energy (electricity and gas), transport (air, rail and road transport), and communication (post and telecommunications) (ETCR), as well as retail trade and professional services.^{8,9} There are two important reasons for measuring regulation in non-manufacturing sectors. First, these sectors represent around two-thirds of economic activity; some of them, notably telecommunications and retail trade industries, are relatively dynamic in terms of productivity growth and employment; and most of these services provide intermediate inputs in the production of other services and manufacturing products. Second, economic regulation is very much concentrated in services and other non-manufacturing sectors. These sectors are characterised by a limited degree of international competition and domestic regulations impact strongly on economic activity and the welfare of consumers, affecting the quality, the variety and the price of such products.¹⁰

8 These indicators were first completed in the context of the OECD project on product and labour market interactions (Nicoletti *et al.* 2001). They are described in detail in Conway and Nicoletti (2005).

9 The annex goes into more detail on the sector and time coverage of the NMR. The OECD FDI Regulatory Restrictiveness Indicator constitutes another element in the PMR system. It is described in Golub (2003) and Koyama and Golub (2006). The Investment Division, Secretariat of the OECD Investment Committee, in the Directorate for Financial and Enterprise Affairs, in co-operation with the Economics Department, is working on an update and an expansion of the index to more sectors.

10 See Wöflfl (2003, 2005), Pilat and Wöflfl (2005), and OECD (2001).

9. The economy-wide and sectoral indicators are based on qualitative information that is coded by assigning a numerical value to each of the possible responses to a given question.¹¹ The coded information is normalised over a scale of zero to six, reflecting increasing restrictiveness of regulatory provisions for competition. These data are then aggregated into low-level indicators at the bottom of the indicator tree by assigning subjective weights to the various regulatory provisions.¹² At each step up the indicator tree, higher-level (composite) indicators are calculated as weighted averages of their lower-level indicators. In the previous, 1998 and 2003, rounds of the PMR indicator construction, the weights used for aggregation were based on principal component analysis (PCA), while the composite NMR indicators were generated using equal weights for all the low level indicators.¹³

2.2. *A revised and updated PMR indicator system*¹⁴

10. The current update and revision of the OECD indicator system involved basically two main steps (see also the annex for a detailed description):

- First, the analysis of developments in product market regulation over 1998-2008 is based on a new "integrated PMR indicator" that enhances and brings together previously separate economy-wide and sectoral indicators into a single, more comprehensive measure of product market regulation.¹⁵ This indicator should enable and facilitate the analysis of changes in individual (all-purpose or sectoral) regulatory policies in OECD countries and their impact on overall regulatory stance. Figure 1 shows the tree structure of the "integrated PMR indicator" that constitutes the basis for describing the evolution of product market regulation in OECD countries in the next section. Box 2 provides short definitions of its 18 low-level components.
- Second, technical improvements in the indicator construction were implemented. This includes improved data collection and processing, so as to make future updates of the PMR indicators more timely and transparent, to reduce uncertainty in the data, and to facilitate the planned extension to new member countries. Furthermore, several revisions of the underlying methodology were made, with a prominent example being the revision of the aggregation methodology, which is now based on assigning equal weights to low-level indicators within each of the main regulatory domains (see the annex for more detail). The resulting new set of weights for the composite "integrated PMR indicator" is shown in parentheses in Figure 1.

11 In contrast to the aggregate PMR indicator, however, the ETCR components of the NMR indicators were originally based to a much larger extent on external data sources.

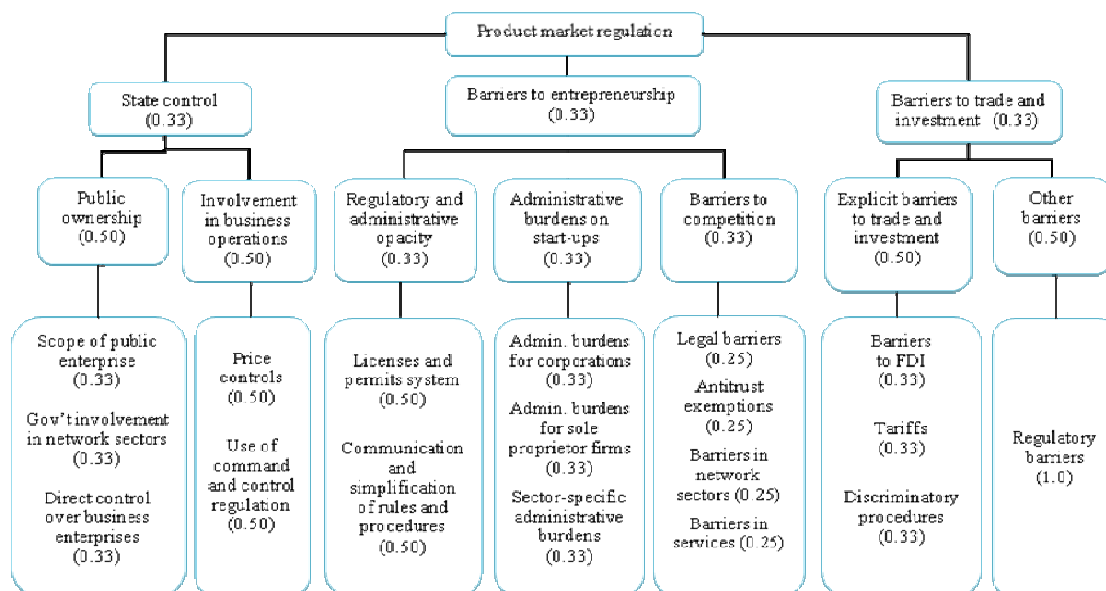
12 Generally, provisions are grouped by area or sector and equal weights were assigned to them within each of these areas or sectors.

13 The PCA methodology groups together lower-level indicators that are most associated with different underlying (unobserved) principal components. Principal components represent sub-domains of regulation that can be given a straightforward economic interpretation, such as 'public ownership' and 'government involvement in business operation' in the domain 'state control'. The same technique was then applied in order to aggregate the domains into the overall PMR indicator, which then reflects the broad regulatory stance in a certain OECD member country. See the annex as well as Conway *et al.* (2005) for more detail on the reconsideration of the weighting technique in the course of the 2008 PMR revision.

14 The revision of the PMR indicator system has strongly benefitted from suggestions and contributions by other OECD Directorates, notably the OECD Directorates for Financial and Enterprise Affairs, for Governance, for Trade and Agriculture and for Science, Technology and Industry.

15 In order to avoid double-counting in the course of integrating sectoral data, the sub-level indicator 'size of public enterprises' in the former economy-wide PMR indicator has been replaced by sectoral data on government involvement in network sectors.

Figure 1: The tree structure of the integrated PMR indicator



Source: OECD, Product Market Regulation Database.

Box 2: The meaning of the low-level indicators

The overall PMR indicator is constructed from 18 low-level indicators. This box provides a short description of each of them. A detailed description of the way each low-level indicator is constructed can be found in the annex.

Scope of public enterprises: measures the pervasiveness of state ownership across business sectors as the proportion of sectors in which the state controls at least one firm (based on 24 business sectors).

Government involvement in network sectors: measures the extent of public ownership in the energy, communications and transport sectors (based on detailed data for seven network industries).

Direct control over business enterprises: measures the existence of government special voting rights in privately-owned firms, constraints on the sale of state-owned equity stakes, and the extent to which legislative bodies control the strategic choices of public enterprises (based on 24 business sectors).

Price controls: reflects the extent of price controls in competitive sectors, such as air travel, retail trade, road freight, professional services, and mobile communications.

Use of command and control regulation: indicates the extent to which government uses coercive (as opposed to incentive-based) regulation in general and in specific services sectors (road freight, retail trade, air transport, railways, professional services).

Licenses and permits systems: reflects the use of 'one-stop shops' and 'silence is consent' rules for getting information on and issuing licenses and permits.

Communication and simplification of rules and procedures: reflects aspects of government's communication strategy and efforts to reduce and simplify the administrative burden of interacting with government.

Administrative burdens for corporations: measures the extent of administrative burdens on the creation of corporations.

Administrative burdens for sole proprietors: measures the extent of administrative burdens on the creation of sole proprietor firms.

Sector-specific administrative burdens: reflects administrative burdens in the road transport and retail distribution sectors.

Legal barriers: measures the pervasiveness of barriers to entry across business sectors as the proportion of sectors in which there are explicit legal limitations on the number of competitors (based on 24 business sectors).

Antitrust exemptions: measures the scope of exemptions from competition law for public enterprises.

Barriers to entry in network sectors: measures various kinds of entry barriers in network sectors, as well as the degree of vertical integration in energy, rail transport and telecommunication sector (based on detailed data for seven network sectors).

Barriers to entry in services: measures barriers to entry in retail trade and professional services.

Barriers to foreign direct investment (FDI): measures general and sector-specific restrictions on foreign acquisition of equity in public and private firms, obligatory screening procedures and operational controls for affiliates of foreign firms (e.g. nationality requirement for key personnel). This indicator covers manufacturing, construction, electricity and 9 services sectors.

Tariffs: reflects the average of most-favored-nation tariffs, computed from detailed product data on tariffs.

Discriminatory procedures: reflects the extent of discrimination against foreign firms at the procedural level.

Regulatory barriers: reflects other non-tariff barriers to trade, such as lack of mutual recognition agreements or international harmonisation of standards.

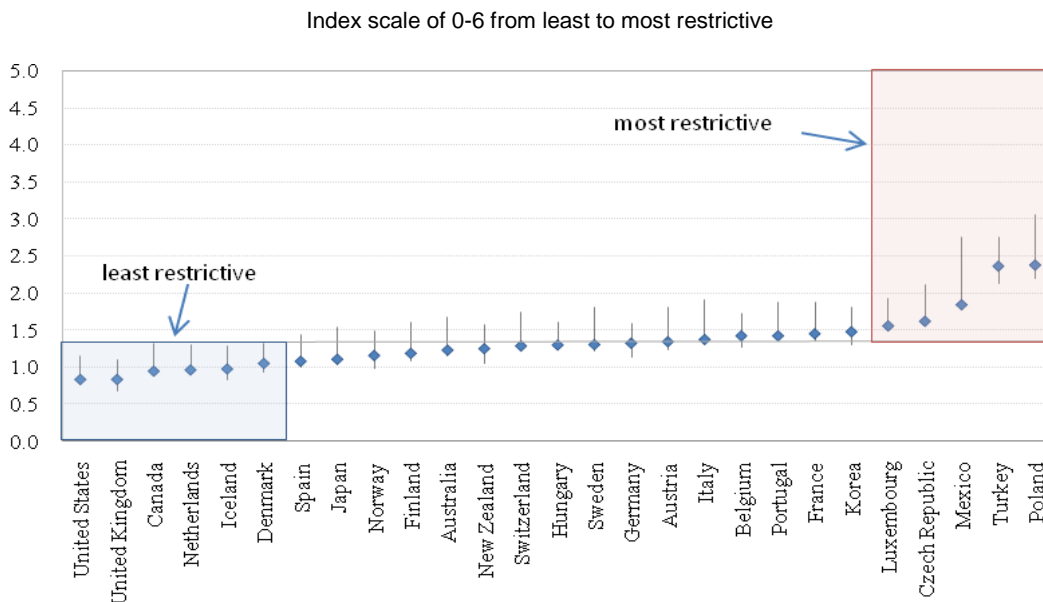
3. Patterns and trends in product market regulation in OECD countries until 2008

3.1 Countries' current regulatory stance

11. The update of the indicators of product market regulation provides a snapshot of countries' policy stance in early 2008. The indicators represent the stringency of regulatory policy on a scale from 0 to 6 with higher numbers being associated with policies that are more restrictive to competition.

12. At the aggregate level, and using standard statistical criteria to deal with the inherent uncertainty in the "scoring" of policies in different areas (Box 3), three country groups can be distinguished with regard to their regulatory stance (Figure 2). At one end of the spectrum is a group of countries characterised by a level of anti-competitive restrictions that is significantly lower than the OECD average. This group comprises the United Kingdom, the United States, Iceland, Canada, Denmark and the Netherlands. At the other end of the spectrum is a smaller group of countries, characterised by restrictions on competition that are significantly higher than average. This group comprises Luxembourg, the Czech Republic, Mexico, Turkey and Poland. The remaining group of countries appears to have regulatory approaches that are close to the OECD average, though to varying degrees according to point estimates.

Figure 2: Aggregate PMR scores, 2008



1. Countries are ranked according to the indicator score on aggregate or domain. Diamonds represent the indicator scores, lines represent 90 % confidence intervals derived from the Random Weights approach (see Box 3).

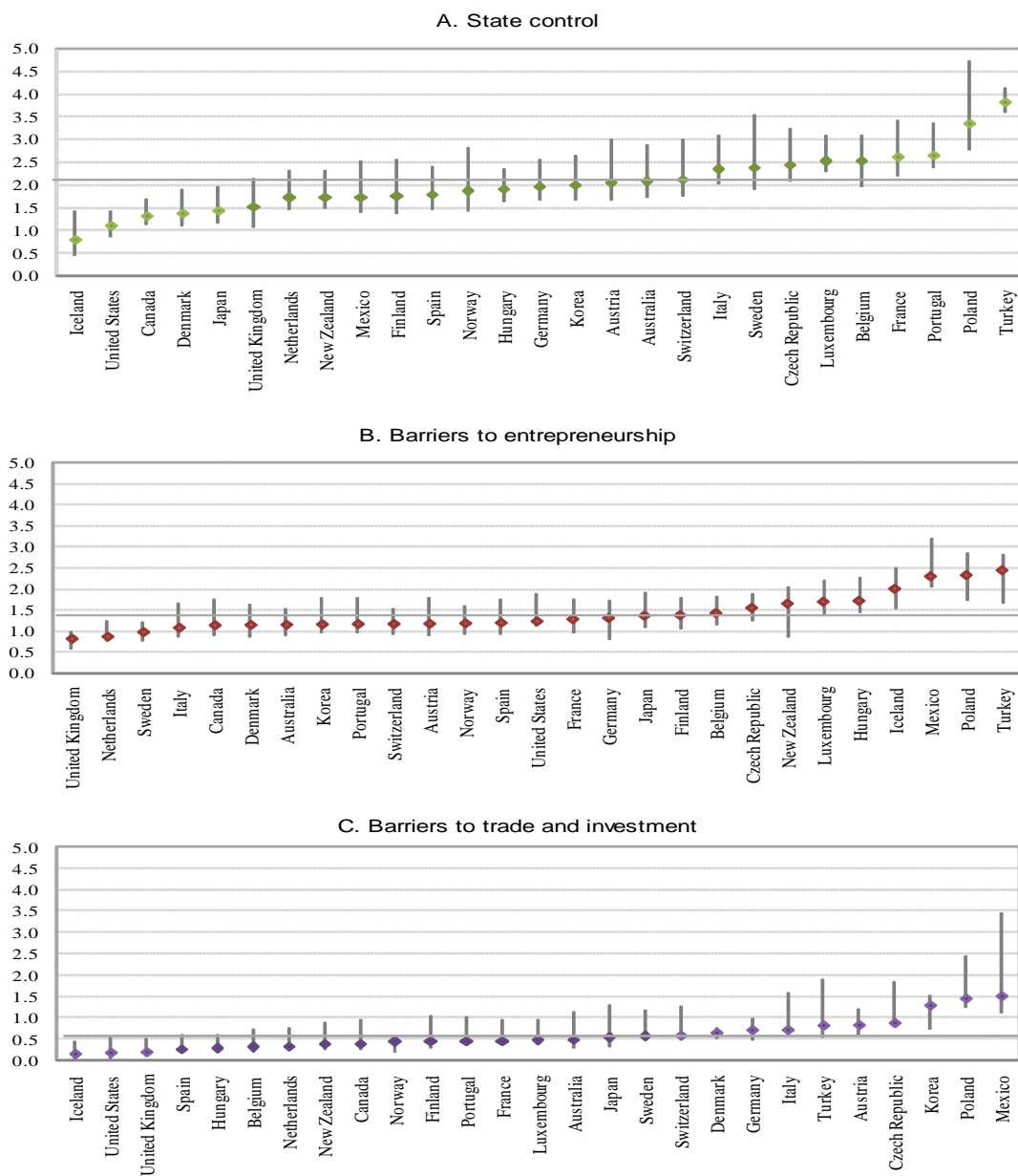
Source: OECD, Product Market Regulation Database.

13. As to the composition of aggregate product market regulation (Figure 3), anti-competitive regulation appears to be concentrated in two regulatory domains. This concerns first, the domain ‘state control’, which reflects the extent to which governments influence firm decisions through public ownership, price controls or other forms of coercive – instead of incentive-based – regulation (Panel A). It concerns second, the domain ‘barriers to entrepreneurship’ which reflects obstacles to easy access to information on existing regulation, general or sector-specific administrative burdens for business start-ups or other general or sector-specific regulations that hinder entry of firms (Panel B). In contrast, barriers to trade and investment, capturing barriers to foreign ownership of firms, tariffs and other non-tariff barriers to trade, appears to play only a minor part in limiting competition in most OECD countries (Panel C).

14. Finally, the relative position of countries varies across the three main regulatory domains (Figure 3). For instance, the importance of state control seems to be lower in Iceland and the United States than elsewhere in the OECD, and barriers to trade and investment still appear to play a relatively important role in limiting overall competitive pressures in Korea, Mexico and Poland.

Figure 3: PMR scores by domain, 2008

Index scale of 0-6 from least to most restrictive



2. Countries are ranked according to the indicator score by domain. Diamonds represent the indicator scores, lines represent 90 % confidence intervals derived from the Random Weights approach (see Box 3).

Source: OECD, Product Market Regulation Database.

Box 3: Statistical analysis of differences in regulation across countries and over time

Constructing a composite quantitative indicator from qualitative information is always prone to measurement errors. It is therefore necessary to analyse to which extent the regulatory environments are statistically different across countries. The overall PMR indicator is essentially a linear aggregate of the low level indicators, and for a given country i (at a certain point in time) can be represented as:

$$PMR_i = \sum_k w^k \cdot lowlevel_i^k \quad (1)$$

Where $lowlevel_i^k$ is the score of the low level indicator k for country i and w^k is the weight of the k -th low level indicator in the overall PMR. The weights sum up to 1 across the low level indicators.

In the representation above, one can distinguish two main sources of uncertainty. The first source of uncertainty can be attributed to the weights used to aggregate indicator scores, *i.e.* the w^k . For instance, aggregate PMR values and the cross-country ranking would be somewhat different if they were based on Principal Components Analysis as compared to Equal Weighting. Moreover, given a particular aggregation methodology, aggregate values depend on the nesting structure of the composite indicator which again impacts on the weights that are attributed to each individual low-level indicator in the composite indicator.

The second source of uncertainty can be attributed to the scores of the low level indicators, *i.e.* $lowlevel_i^k$. The set of policies based on which the indicator is constructed can be seen as randomly drawn observations from a population of regulatory policies in a country. Furthermore, they can be measured with an error. For example, the replies to individual questions depend to some extent on the personal judgement of the respondent and of its reviewers at various levels of the national administrations. Furthermore, even though the questionnaire was expressly designed to minimise the need for the OECD Secretariat to interpret the answers, a certain degree of interpretation was still necessary in some cases. Finally, a certain amount of "expert judgement" is always needed when qualitative data are turned into quantitative indicators through particular coding and aggregation procedures.

This paper applies two different approaches to the PMR values in order to address the two different sources of uncertainty. The Random Weights approach (RW) provides an indication of the sensitivity of the final PMR values to changes in *weights* and is thus an attempt to deal with the first type of uncertainty. By allowing for different, randomly generated weights it generates a distribution of PMR indicator values from which the confidence of the estimated aggregate PMR score can be assessed. Essentially the RW approach consists of a Monte Carlo simulation in which an aggregate PMR indicator value is computed 10 000 times. At each step, the algorithm draws weights for each single low level indicator from a uniform distribution between 0 and 1. These weights are then rescaled by the sum of all (randomized) weights in order for the new sum to be equal to one. These rescaled weights are used to aggregate the low level indicators into a new PMR value. After 10 000 repetitions, a realized distribution of the PMR is obtained, and the 5th and 95th percentile are used to obtain the 90% confidence intervals.

The Country-Product Dummy approach (CPD, see also Summers (1973), Diewert (2005) and Prasada Rao (2005)) is an attempt to look at the second type of uncertainty, *i.e.* *errors in the measurement* of the low-level indicators. The main assumption of the CPD approach is that each country has a given level of regulatory restrictiveness which is not directly observable. However, one can observe a number of measures of regulatory restrictiveness drawn from a population of policies, and these are determined by a country specific term, a policy specific term that captures the relative levels of each low level indicator across countries, a time-factor and an error term. Assessing differences in the restrictiveness of policies across countries consists then basically in regressing the low-level indicators on a set of country-time and policy dummies as in the following equation:

$$lowlevel_{it}^k = \alpha_{1998,i} C_{1998,i} + \alpha_{2003,i} C_{2003,i} + \alpha_{2007,i} C_{2007,i} + \beta_k P_k + \varepsilon_{kit} \quad (2)$$

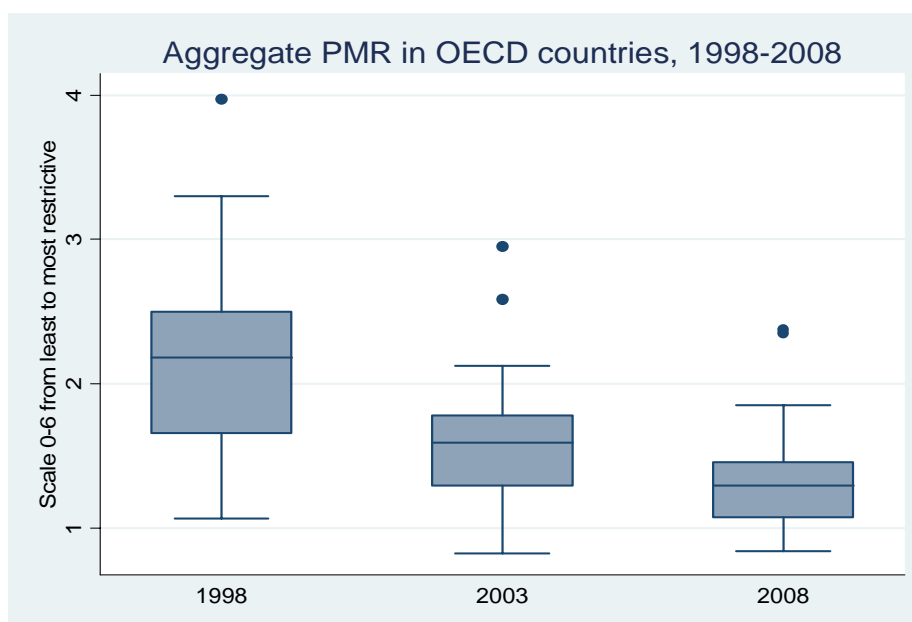
where i , t and k are country, time and low-level policy indexes; the left hand side variable is the value of each low level indicator at a certain time in a given country; the right hand side contains only dummy variables, *e.g.* C_{1998} will take the values of 1 for country i and year 1998, and P_k represent policy dummies. The estimated α coefficients reflect the country specific level of overall regulation in a given year. These can be used to test whether country A 's policies were significantly more restrictive than country B 's in a given year by statistical tests on $\alpha_{year,A} > \alpha_{year,B}$. Moreover, testing $\alpha_{year,A} > \alpha_{year+s,A}$ allows inference on whether policies in country A became significantly less restrictive after s years.

The equation can be estimated by Ordinary or Weighted Least Squares. The latter is used for the PMR in order to account for the nesting structure of the PMR indicator. Standard coefficient equality tests can be used under the assumption of normality of the error terms. As in the PMR case the normality of residuals hypothesis is strongly rejected, bootstrapped values are used.

3.2 Reform of product market regulation since 1998

15. The regulatory stance in 2008 is the result of extensive liberalisation of product markets over the past ten years as described in Figure 4. The aggregate PMR score moved from around 2.2 index points in 1998 to around 1.3 index points in 2008 on average across countries, as reflected in the line within the box, representing the median of aggregate PMR across countries. The variance of regulatory environments across countries has also decreased substantially since 1998, as measured by a decreasing size of both the box and whiskers around the median value. Moreover, the shift of the median level of regulation towards the middle of the box indicates that indeed the number of OECD countries that moved towards a more liberal regulatory environment increased over time.

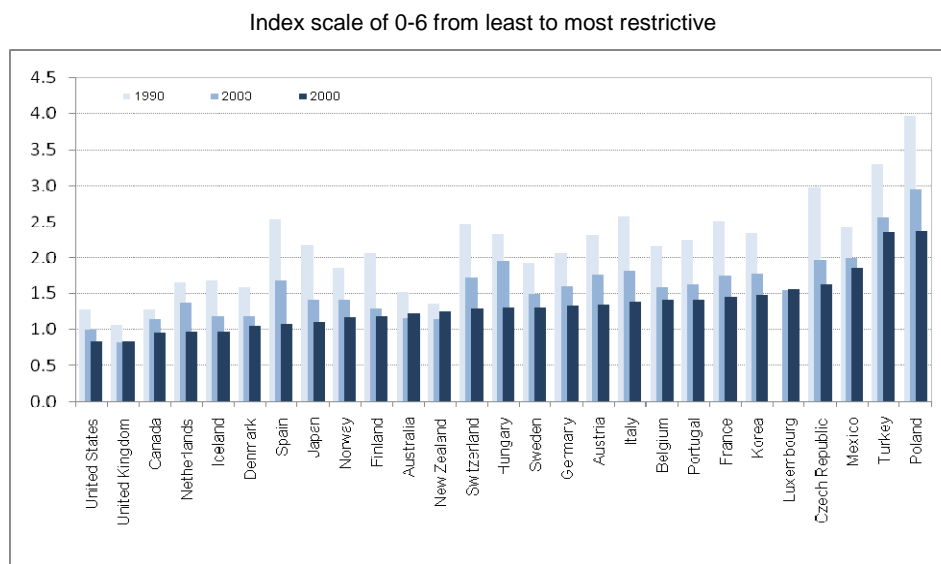
Figure 4. Aggregate regulation (integrated PMR) and its dispersion across countries over time



1. The horizontal line in the middle of the box represents the median of the aggregate regulation scores across countries. The edges of the box represent the dispersion of regulatory policies across countries measured by the 1st and 3rd quartiles of the cross-country distribution. The lines below and above the box represent two extreme values of the distribution as measured by 1.5 times the upper limit of the box, and the dots represent outliers.

Source: OECD, Product Market Regulation Database.

16. These aggregate trends mask wide differences in reform across countries and over time though, as reflected in Figure 5 and Table 1. Using the “Country-Product Dummy (CPD)” approach (Box 3), Table 1 suggests first, that reforms appear to have significantly changed (in a statistical sense) the overall regulatory environment as measured by the PMR indicator for 20 countries. These include in particular Austria, the Czech Republic, Finland, France, Germany, Hungary, Italy, Japan, the Netherlands, Norway, Portugal, Spain and Switzerland, as well as Belgium, Denmark, Korea, Iceland, Poland, Sweden and Turkey - albeit at a slightly lower level of significance. Second, the number of countries with significant reforms is much larger over the 1998-2003 period than over the 2003-2008 period. Changes over the most recent period appear to have been (statistically) significant only for three countries: Hungary, Spain and, to a lesser extent, the Netherlands. Interestingly, Spain turns out to be the only country with a (statistically) significant easing of overall regulation in both periods.

Figure 5: Development of aggregate product market regulation since 1998

Source: OECD, Product Market Regulation Database.

Table 1. Table 1: Significant changes in integrated PMR over time

	1998 to 2003	2003 to 2008	1998 to 2008
Australia	(-)	(+)	(-)
Austria	(-)*	(-)	(-)****
Belgium	(-)	(-)	(-)*
Canada	(-)	(-)	(-)
Czech Republic	(-)**	(-)	(-)****
Denmark	(-)	(-)	(-)*
Finland	(-)****	(-)	(-)****
France	(-)****	(-)	(-)****
Germany	(-)*	(-)	(-)****
Hungary	(-)	(-)**	(-)****
Iceland	(-)	(-)	(-)**
Italy	(-)**	(-)	(-)****
Japan	(-)*	(-)	(-)****
Korea	(-)	(-)	(-)*
Luxembourg	.	(+)	.
Mexico	(-)	(-)	(-)
Netherlands	(-)	(-)*	(-)****
New Zealand	(-)	(+)	(-)
Norway	(-)*	(-)	(-)****
Poland	(-)	(-)	(-)**
Portugal	(-)**	(-)	(-)****
Spain	(-)*	(-)*	(-)****
Sweden	(-)	(-)	(-)**
Switzerland	(-)*	(-)	(-)****
Turkey	(-)*	(-)	(-)**
United Kingdom	(-)	(+)	(-)
United States	(-)	(-)	(-)

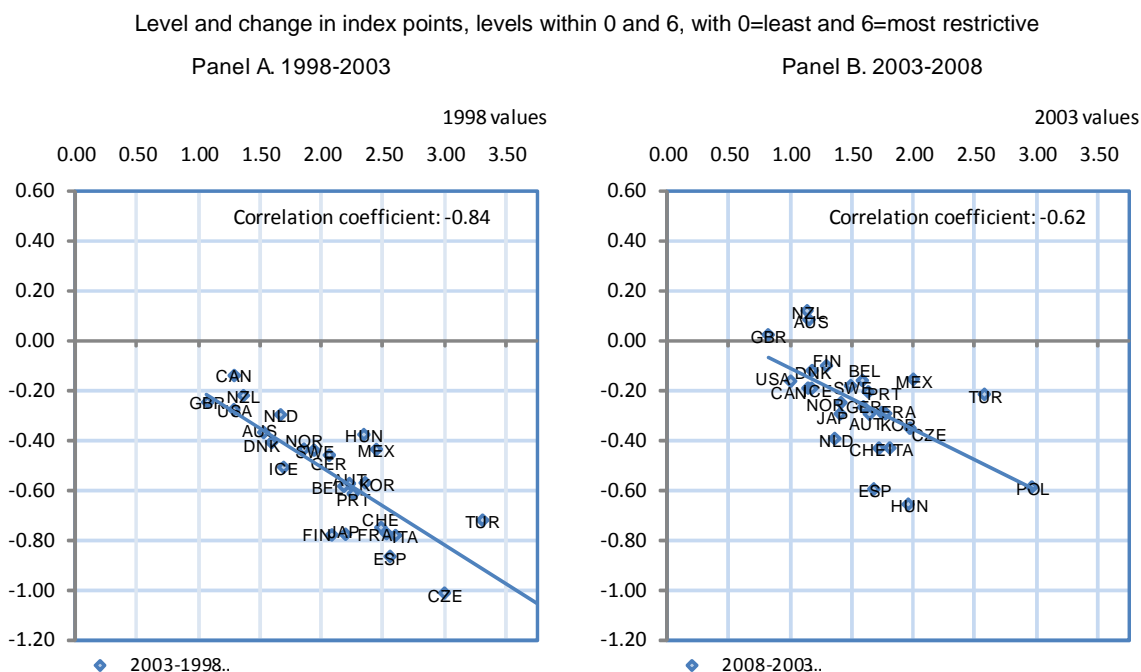
Source: OECD, Product Market Regulation Database.

17. As a result of these policy trends, the degree of convergence of product market regulation across OECD countries was stronger in the period 1998 to 2003 than in the period between 2003 and 2008

(Figure 6).¹⁶ Especially in the earlier period, 1998-2003, convergence is reflected in strong regulatory reform in countries that were farther away from best practice, as confirmed by the correlation coefficient of -0.84 . While this tendency has continued in the most recent period for most countries, it was less evident in others, such as Turkey and Mexico where regulatory reforms were weaker than might have been expected given their original restrictive stance.

18. Based on the political economy-factors influencing the extent and timing of product market reforms (Box 4), the slowing of reform may suggest that further improvement becomes more difficult beyond a certain level of regulation in each area. It could also signal the existence of declining marginal gains from reform in terms of economic gains from competition. Alternatively, several countries that have reformed a large number of regulatory areas are increasingly left with some hardcore areas of regulation that are politically more difficult to reform. Finally, it may reflect that policy-makers wish to evaluate the benefits and costs of past reform before launching further reform efforts.

Figure 6: Convergence in aggregate PMR



Source: OECD, Product Market Regulation Database.

¹⁶ Convergence is observed if there is a negative relationship between the level of aggregate regulation at the beginning of the period, represented on the horizontal axis, and the change in aggregate regulation since then, as represented on the vertical axis.

Box 4. Factors influencing product market reform

Since less competition generates rents in the economy, product market reforms that can raise competition often meet opposition. This is the case as the costs of implementing structural reform tend to be upfront and concentrated on relatively small and well-organised target groups (e.g., stakeholders in sheltered industries), while the associated benefits (e.g., for consumers) are less certain, thinly spread and take time to materialise.

As discussed in Høj *et al.* (2006) and Castanheira *et al.* (2006), the extent and timing of structural reform is influenced by a number of different factors, including initial economic and structural conditions, as well as the political orientation of governments and the political business cycle. For instance, the results in Høj *et al.* (2006) suggest that deep crises have tended to encourage product market reforms in the past. In contrast, reforms may be hindered by poor fiscal positions insofar as measures to accommodate temporary negative effects of reforms on demand or employment would have to be financed.

Technological progress, openness to trade, international integration as well as developments in regulatory techniques may also favor the implementation of product market reforms. For instance, in telecommunications, technological progress has tended to undermine natural monopolies and stimulate entry of firms and competition with positive effects in terms of lower prices and a larger variety of products. This in turn has made liberalisation and regulatory reform easier in this sector. Furthermore, the accession to the European Union of Poland, Hungary and the Czech Republic appears to have stimulated a large set of structural reforms there. Finally, the refinement of regulatory techniques has made reform easier in sectors, such as electricity, where there are both competition and natural monopoly elements.

3.3. *The sources of regulatory reform*

19. Table 2 and Figure 7 portray the regulatory reform patterns within each of the three regulatory domains (see Box 2 for a detailed description of the different regulatory categories). In general, the regulatory areas where most of the reform can be observed are as follows:

- In 'state control', particularly strong and widespread reforms involved lifting price controls, with substantial action between 1998 and 2003 followed by limited action since then, partly reflecting movement towards best practice in many countries. Reforms were also implemented – to a more limited extent but more consistently over time – in the areas of government involvement in network sectors and command and control regulation.
- In 'barriers to entrepreneurship', easing of the license and permits system and better communication and simplification of regulations have led to a lower degree of regulatory and administrative opacity in many OECD countries though effort in these areas has tended to fade over the most recent period. Conversely, administrative burdens for start-ups and other, non-sector specific legal barriers to competition have been lowered to a limited extent only, with some countries taking the opposite approach.
- Within the 'barriers to trade and investment', in most countries only foreign ownership barriers have been eased throughout the whole period.¹⁷ In contrast, while some discriminatory procedures and regulatory barriers were reduced or eliminated between 1998 and 2003, a more restrictive stance has crept back since then – albeit only in a few countries.

17 The Czech Republic, Hungary and Poland also reduced tariff rates in the course of EU-Accession.

Table 2: Patterns of regulatory reforms between 1998 and 2008

2007-1998 changes	State control					Barriers to entrepreneurship									Barriers to trade and investment				Number of regulatory areas with reforms since 1998	Number of regulatory areas with restrictions since 1998
	Scope of Public Enterprises	Direct control over business enterprises	Government involvement in network sectors	Command and control regulation	Price controls	Licenses and permits system	Communication and simplification	Administrative burdens corporations	Administrative burdens sole proprietorship	Sectoral administrative burdens	Legal barriers	Antitrust exemptions	Barriers to entry in network sectors	Barriers to entry in services	Barriers to FDI	Tariffs	Discriminatory procedures	Regulatory barriers		
Australia	+	+	-	-	-	-	-	-	-	-	-	+	-	+	-	-	-	-	8	4
Austria	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	14	0
Belgium	-	-	-	-	-	-	-	-	+	-	-	-	-	-	-	-	-	-	12	2
Canada	-	+	-	-	-	-	-	-	-	-	+	-	-	+	-	-	-	-	11	3
Czech Republic	-	-	-	-	-	-	-	-	-	+	-	-	-	+	-	-	-	-	14	3
Denmark	-	-	-	-	-	-	-	+	+	+	-	+	-	+	-	-	+	-	10	6
Finland	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	14	0
France	-	+	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	14	1
Germany	-	-	-	-	-	-	-	-	-	-	-	-	-	+	-	-	-	-	12	2
Hungary	-	-	-	-	-	-	+	-	-	+	-	-	-	+	-	-	-	-	13	3
Iceland	-	-	-	-	-	-	-	-	-	-	+	-	-	+	-	-	-	-	12	2
Italy	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	+	-	13	1
Japan	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	+	-	-	13	1
Korea	-	+	-	-	-	-	-	+	-	-	-	-	-	+	-	-	-	-	13	3
Luxembourg	+	+	-	-	+	+	-	+	+	+	+	+	+	-	-	-	-	-	7	9
Mexico	-	-	-	-	-	-	-	-	+	-	-	+	+	+	+	+	-	-	11	5
Netherlands	-	-	-	-	-	-	-	-	-	-	-	-	-	+	-	-	-	-	15	1
New Zealand	+	+	+	-	-	+	-	-	-	-	+	+	-	-	-	-	-	-	10	6
Norway	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	13	0
Poland	-	+	-	-	+	-	-	-	-	-	-	-	-	-	-	-	-	-	14	2
Portugal	-	-	-	-	-	-	-	-	+	-	+	-	-	+	-	-	-	-	13	3
Spain	-	-	-	-	-	-	-	-	-	-	-	-	-	+	-	-	-	-	14	1
Sweden	+	+	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	13	2
Switzerland	-	-	-	-	-	-	-	-	-	+	-	-	-	-	-	+	-	-	13	2
Turkey	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	15	0
United Kingdom	+	+	-	+	-	-	-	-	-	-	-	-	-	-	-	-	-	-	11	3
United States	-	-	-	+	-	-	+	+	-	+	+	-	-	-	-	-	-	-	12	5
Number of countries promoting competition since 1998	17	18	24	25	25	16	25	19	20	20	20	12	26	14	25	4	15	9		
Number of countries restricting competition since 1998	5	9	1	2	2	2	2	4	5	6	7	5	1	13	2	1	2	1		

Note: The "-" represent cases in which product markets have been liberalised since 1998, the "+" represent cases in which regulation has become more restrictive since 1998, the blanks are cases with no change in regulation since 1998. The markers are computed as the overall change between 1998 and 2008 in index points.

Source: OECD, Product Market Regulation Database.

20. Thereby, liberalisation of product markets in both periods appears to have been driven to a considerable extent by reforms in sector-specific regulation. In the ‘command and control’ category for example, much of the reform is due to easing of regulations in road freight (Figure 7, Panel A). Reductions or elimination of price controls in retail trade and road transport have contributed strongly to overall reform, as is equally the case for reductions in barriers to FDI in particular sectors.

21. Moreover, reforms in regulatory categories that cover sector-specific regulation were widespread across countries while the average reduction in the indicator scores in more cross-cutting regulatory categories results from large changes in a few countries only (Table 2). The latter is notably the case for ‘regulatory barriers to trade and investment’ and to a smaller extent ‘licenses and permits systems’ which covers for instance the introduction of single contact points for information on regulation or for issuing notifications.

22. Particular reform progress in sector-specific regulation can be observed for network sectors (Figure 7, Panel B). For instance, almost all countries reduced entry barriers to network sectors, albeit with a marked slowdown in reforms in the most recent period. These reforms reflect largely an increasing recourse to regulated third party access in the gas and electricity markets and some unbundling within gas and electricity sectors. Reduced shares of public ownership in the incumbent firms in such sectors, as well as in telecommunications, underpin the recorded decline in government involvement in network industries.

Figure 7. Sources of reform in Product Market Regulation¹

Index scale of 0-6 from least to most restrictive

Panel A: by regulatory area

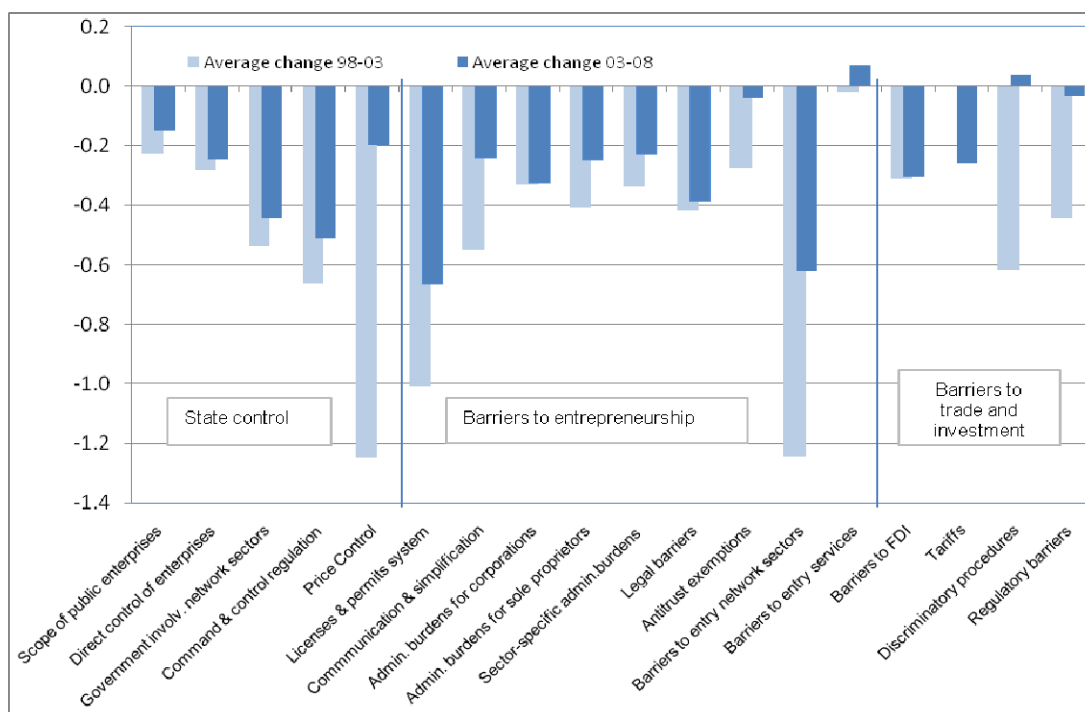
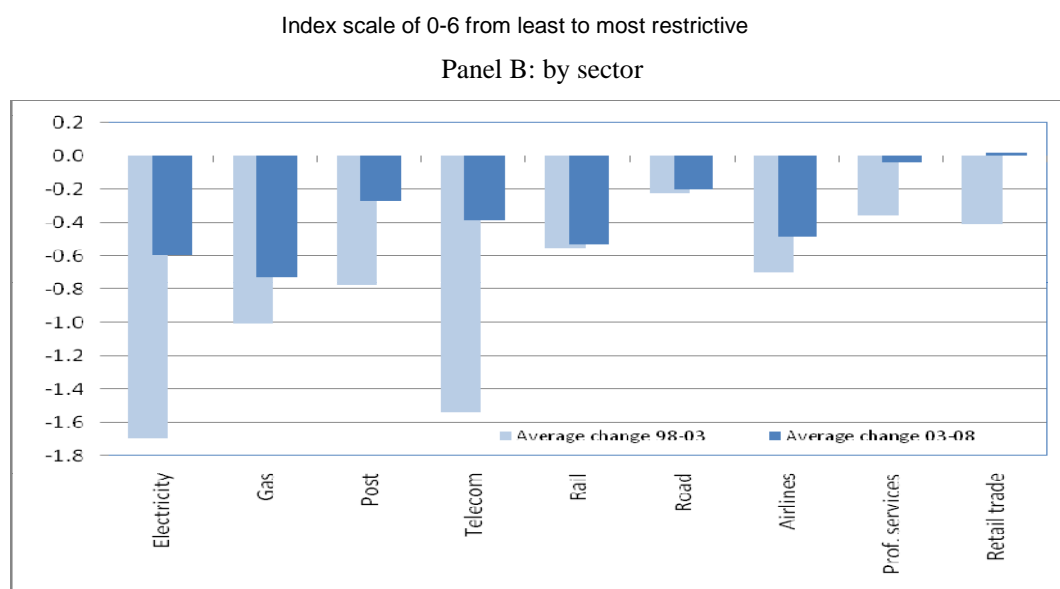


Figure 7. Sources of reform in Product Market Regulation, cont'd

1. Negative (positive) changes indicate pro-competitive (anti-competitive) reforms.

Source: OECD, Product Market Regulation Database.

23. The "integrated PMR", which embodies more sectoral information than past versions of the PMR, highlights that differences in PMR across countries and over time hinge to a large extent on differences in sectoral regulatory policies (Table 3, see also section A2 in the annex for a more detailed analysis). This is the case as regards both the extent to which the level of aggregate regulation in one country is significantly different from the regulatory stance in another country (Panel A) and the extent to which regulation in countries changed significantly over time (Panel B).

Table 3: The role of sectoral regulation in differentiating countries¹

		"Old" PMR	Integrated PMR
Panel A.			
Pairs of countries with statistically significant different regulation, in % of all country pairs	1998	41.5	44.9
	2003	33.2	36.6
	2008	20.8	25.9
Panel B.			
Number of countries with statistically significant changes in regulation over time	'98-'03	8	12
	'03-'08	3	3
	'98-'08	16	20

1. The main difference between the "old" and integrated PMR is that the latter embodies to a larger extent sectoral information.

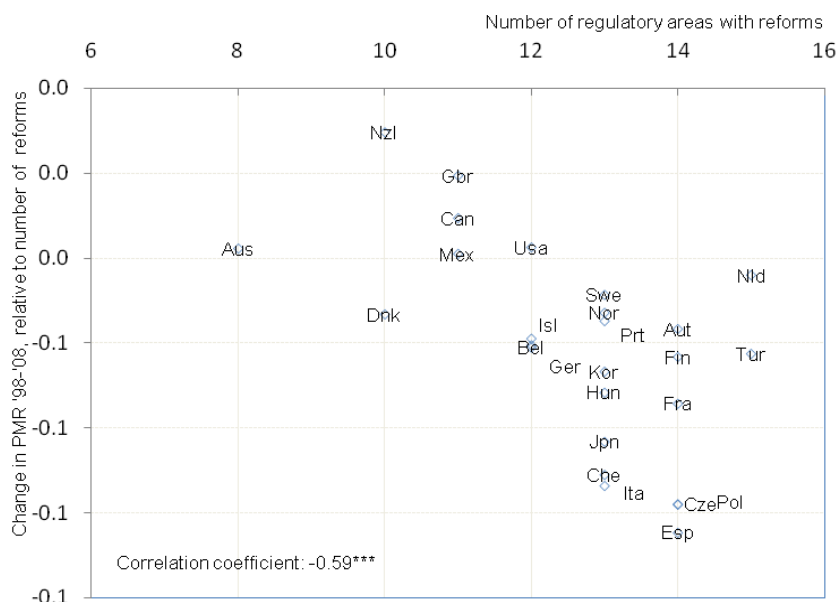
Source: OECD, Product Market Regulation Database.

3.3. Complementarities and consistency in product market regulation

24. The results provide some evidence for the existence of complementarities across policy areas:¹⁸ First, those countries that have reformed substantially over the past ten years have also reformed in a wide range of policy areas (Figure 8, Table 2). This is the case for instance for most of those countries for which significant changes in product market regulation since 1998 could be observed in Table 1. In contrast, little reform progress could be observed for Denmark and New Zealand; these two countries reformed in some areas, but introduced at the same time new restrictions to competition (Table 2).

25. The existence of complementarities may imply first that the introduction of particular reforms may have allowed or facilitated the introduction of other reforms. Moreover, to the extent that such complementarities also exist in terms of their effects on competition or growth, the results point to a large potential of positive combined effects from reforms in several countries.

Figure 8: Number of reformed regulatory areas and the overall extent of regulatory reform



Source: OECD, Product Market Regulation Database.

26. Second, cross-country correlations of changes in regulation over the past ten years between pairs of regulatory areas (as measured by changes in the relevant PMR low-level indicators) suggest that countries have implemented reforms in packages of interrelated regulatory areas (Table 4). For instance, reforming countries have privatised former public monopolies and reduced the extent of direct control in the remaining state-owned enterprises. And they appear to have at the same time reduced legal and sector specific barriers to entry as well as administrative burdens. Thus, they have reformed in areas that typically facilitate firm entry and foster competition in the privatized markets. Finally, deregulation of domestic product markets went along with opening up to international competition as represented by significant pair wise cross-country correlations between some areas of state control and barriers to entrepreneurship on the one hand and areas of barriers to trade and investment on the other hand.

¹⁸ For a discussion of policy complementarities see for instance De Macedo and Oliveira Martins (2008).

Table 4: Reform complementarities between regulatory areas¹⁾

	Scope of public enterprise sector	Direct control over business enterprise	Government involvement in network sector	Price controls	Communication and simplification of rules	Administrative burdens for corporation	Administrative burdens for sole proprietor firms	Legal barriers	Antitrust exemptions	Barriers in network sectors	Discriminatory procedures	Regulatory barriers	Tariffs
	'08-'98	'08-'98	'08-'98	'08-'98	'08-'98	'08-'98	'08-'98	'08-'98	'08-'98	'08-'98	'08-'98	'08-'98	'08-'98
Scope of public enterprise sector	1	0.48	0.49					0.54		0.42			
Direct control over business enterprises		1		0.42		0.38							
Government involvement network sector			1		0.44				0.32	0.45			
Price controls				1		0.37							
Communication and simplification					1								
Administrative burdens for corporation						1	0.46			0.39			
Administrative burdens for sole proprietors							1						
Legal barriers								1					
Antitrust exemptions									1		0.56		
Barriers in network sectors										1			0.54
Discriminatory procedures											1		
Regulatory barriers												1	0.44
Tariffs													1

1. The numbers represent pairs of regulatory areas for which the changes in regulation between 1998 and 2008 are significantly correlated at 90% significance level.

Source: OECD, *Product Market Regulation Database*.

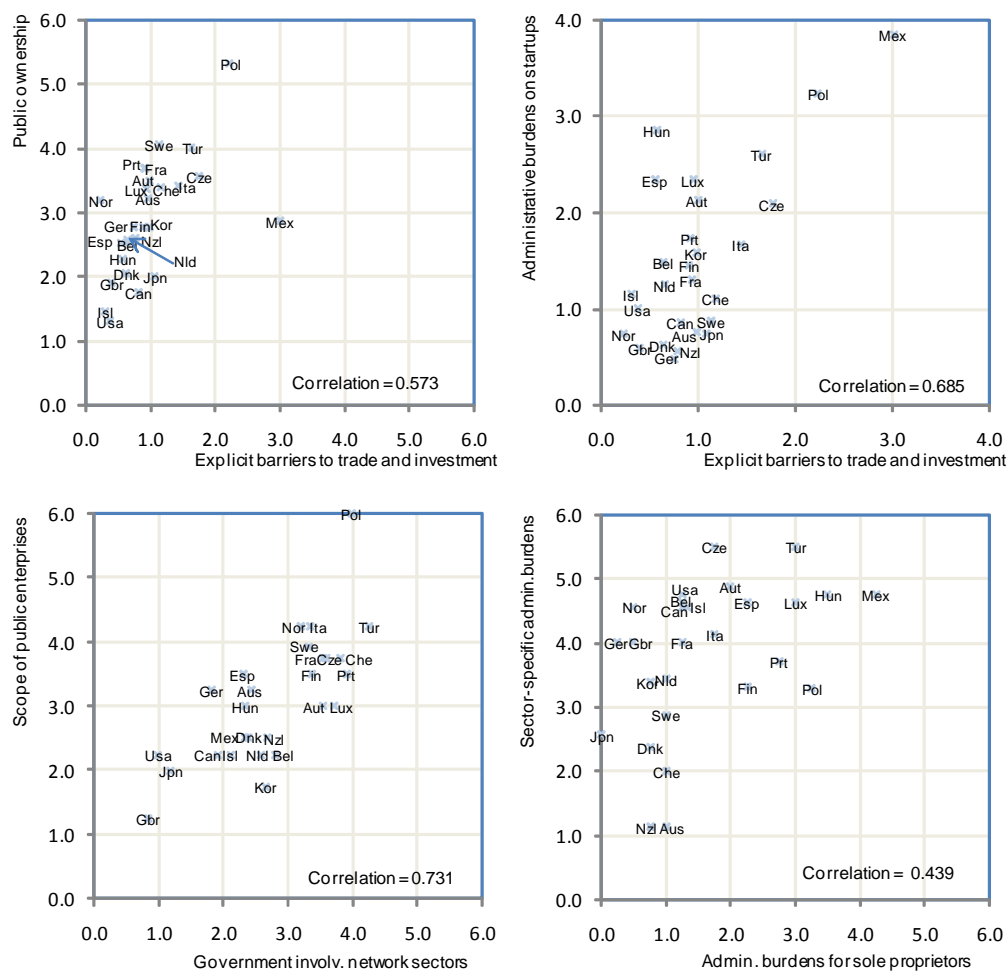
27. These patterns of past reforms, as reflected in cross-country correlations of *changes* in regulation between regulatory areas, are also in line with the extent to which countries apply consistent policies, as reflected in cross-country correlations of *levels* of regulation between regulatory areas. Figure 9 presents such correlations at an intermediate level of aggregation of the PMR indicators. Four correlations are worth mentioning:

- ‘Explicit barriers to trade and investment’ often go along with ‘public ownership’. This is not surprising since public control over business enterprises in certain sectors signals the reluctance to let foreign investors in and, indeed, constitutes in itself a barrier to foreign ownership (Golub, 2003).
- ‘Explicit barriers to trade and investment’ are also correlated with ‘administrative burdens for start-ups’. A possible explanation is that hindrances to trade and investment – for instance in the form of discriminatory border procedures and screening and operational requirements that foreign firms would have to undergo in order to establish and do business in the host country partly reflect a generalised opaque and heavy-handed approach to administrative requirements for businesses.
- Wide ‘scope of public ownership’ tends to be matched by strong ‘government involvement in network sectors’. Thus, in countries in which national or sub-national governments control at least one firm in a wide range of sectors it is more likely that state-controlled firms dominate

partially or totally liberalised network sectors. In contrast, countries that have a hands-off approach in a wide range of business sectors have also often reduced substantially the extent of state control in the network industries.

- Some strong cross-country correlation can also be observed between 'administrative burdens on start-ups of sole proprietor firms' and 'sector-specific administrative burdens'. This may point to generalised and cumulative burdens for small-sized enterprises, since the indicator 'sector-specific administrative burdens' covers industries that are characterised by a large number of very small firms, such as retail trade and road freight. This is particularly obvious in Mexico, Turkey, some former transition countries and some southern European OECD countries.

Figure 9: Policy consistency, 2008



Source: OECD, Product Market Regulation Database.

3.5. Potential for future reform

28. Despite significant easing of anti-competitive product market regulation over the past ten years, a large potential for reform still remains. This concerns regulatory areas or sectors that were characterised by

restrictive regulation in 1998 and where little or no reform has been undertaken since then. Other areas or sectors are still characterised by relatively restrictive regulations, despite some past reforms. Figure 10 illustrates the remaining scope for reform by measuring the distance of regulatory indicator scores from best practice, which represents the absence of anti-competitive regulation.^{19,20}

29. Three main findings emerge:

- First, state control of businesses remains relatively strong, either in terms of the number of sectors in which governments have an equity stake in businesses ('scope of public enterprises'), the share of public ownership within the largest firms in network sectors ('government involvement in network sectors'), or the extent to which governments exert other forms of 'direct control over business enterprises' such as constraints on the sale of state-owned equity stakes or the extent to which legislative bodies control the strategic choices of public enterprises (Panel A of Figure 10).
- Second, even though the reform process was strong in certain sectors, other sectors still show scope for reform (Panel B of Figure 10). This is, for instance, the case for the postal sectors where restrictive regulations reflect a large share of public ownership within the incumbent and relatively little liberalisation of competitive activities. It is also the case for professional services and retail trade where relatively restrictive regulation reflects stringent access requirements and constraints on business conduct in professional services and persistently restrictive licensing for setting up retail outlets.
- Finally, in some regulatory areas as well as for some sectors, the regulatory stance varies strongly across countries as reflected in the variance around the mean in the two Panels of Figure 10. This suggests that in areas with low average regulation, such as administrative burdens for start-ups as well as in air transport, there is still scope for future reform in a number of countries. It also highlights that as reforms of product market regulation have proceeded in many countries, the opportunities for further reform in other countries become more apparent.

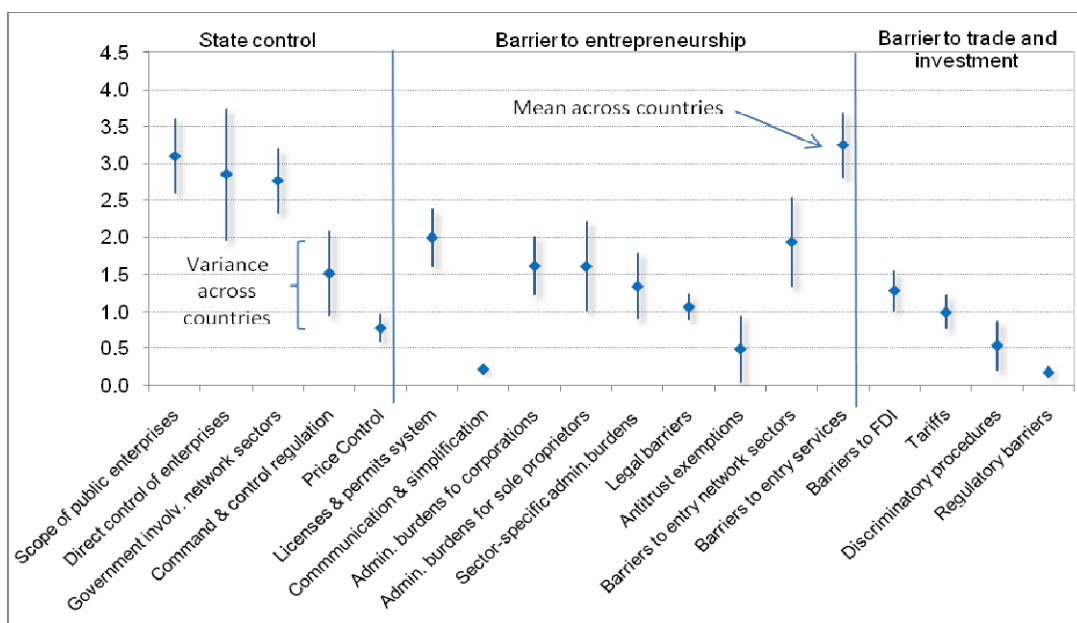
¹⁹ It should be noted that best practice, *i.e.* a zero score on one individual indicator (applying to a regulatory category or sector) does not generally imply the absence of regulation, but just the absence of those regulations that unnecessarily restrict competition.

²⁰ While in most cases, theoretical and actual best practices coincide, the reference here is theoretical best practice: a zero score of an individual indicator (category or sector) is theoretically possible even if it has not yet been actually achieved by any country, *i.e.* even if no country has actually eliminated all hindrances to competition captured by this indicator. Note that while the different indicators provide an accurate picture of distance from best practice and it is thus possible to distinguish regulatory categories where on average the regulatory stance is relatively far from best practice as compared to others where the regulatory stance is relatively close to best practice, comparing precise scores across indicators is not appropriate as each of them reflects a different set of regulatory provisions.

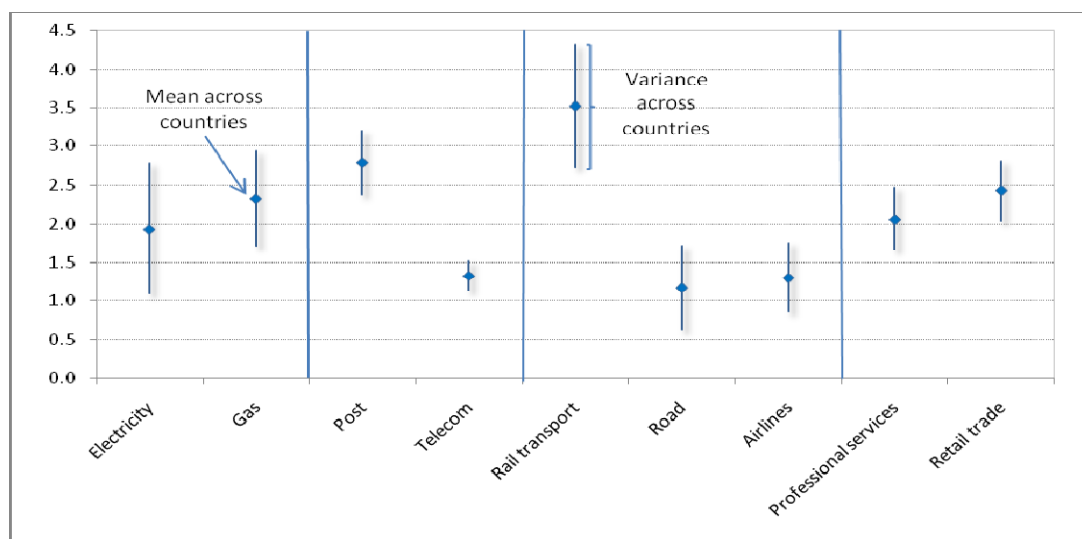
Figure 10. Distance from best practice regulation, 2008

Index scale of 0-6 from least to most restrictive

Panel A: by regulatory area



Panel B: by sector



1. Due to the discrete nature of scores in the case of 'licenses and permits system' and 'tariffs', in these cases the mean is computed as the mode and the variance as the index of qualitative variation. The index of qualitative variation is analogous to the variance as the deviation from the mean. It is defined as one minus the sum over all classes of the squared proportions of observations that fall in a given class (in this case the scaling classes 0 to 6) (Gibbs *et al.*, 1975).

Source: OECD, Product Market Regulation Database.

Outlook

30. This paper has summarised the developments of product market regulation in OECD member countries between 1998 and beginning of 2008. It has illustrated the general tendency towards regulatory reform, has analysed some of the major areas in which reforms have been implemented and has pointed to areas in which there is scope for future reform. The analysis has focused on the reform process over time based on a revised indicator of product market regulation in which information on sector-specific regulation has been integrated to a much larger extent than in earlier rounds.

31. There are three principal areas in which the analysis is currently being further improved:

- The first area concerns the extension of the PMR indicator to new or evolving regulatory issues. Due to changes in technological developments and increased international integration of product markets, also best practice regulations change over time moving the basis for cross-country comparisons. A “new generation” PMR indicator will attempt to capture such new or evolving regulatory issues in two areas: regulatory governance and regulatory quality issues; and the treatment of regulatory or other non-tariff barriers to trade, notably to trade in services.
- The second area of improvement consists in extending the analysis to OECD accession countries and other non-member economies. This involves the construction of PMR indicators for Slovenia, Estonia, Israel, Chile and Russia as well as for the countries that entered into an enhanced engagement process with the OECD (China, India, Brazil, Indonesia, South Africa); in addition PMR indicators for a number of other non-member countries have been or are being compiled.²¹
- Finally, with the current round of revision and extension, the PMR indicator has been computed for three points in time, *i.e.* 1998, 2003 and 2008. Once a larger set of countries will be covered, this indicator could provide also a basis for testing the link between regulation and economic outcomes variables such as measures of competitive pressures and economic growth.

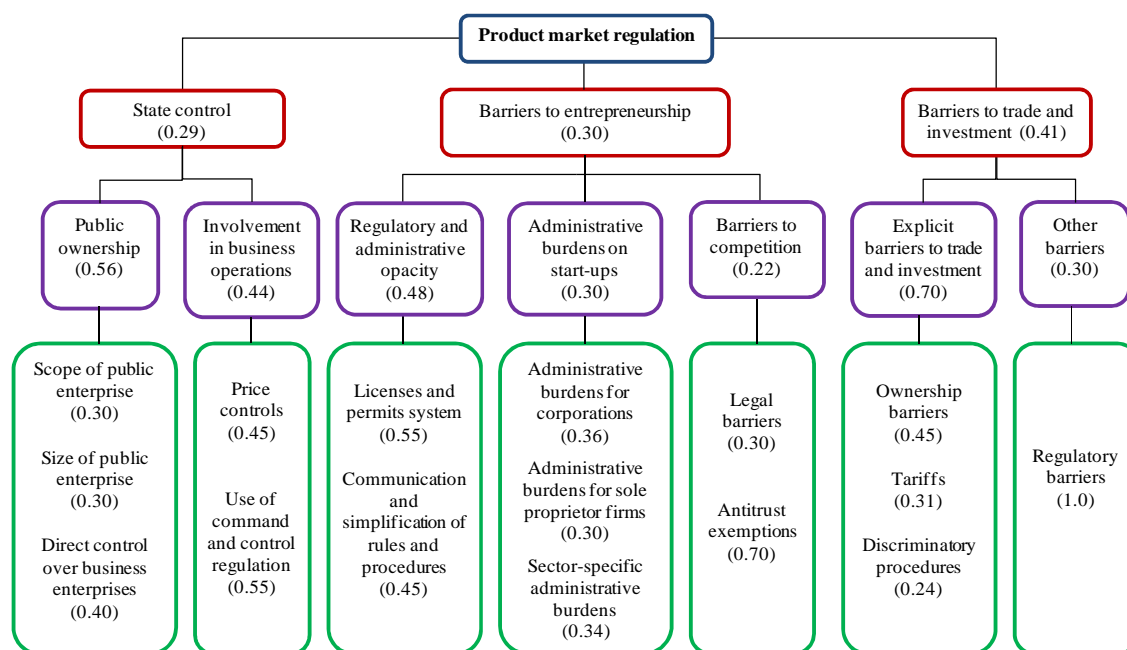
²¹ A PMR indicator for Chile had already been compiled earlier in the context of OECD outreach activities (OECD, 2005b). As regards enhanced engagement and non-member countries, indicators have been computed for India (OECD, 2007a), Ukraine (OECD, 2007b), Brazil (OECD, 2005a), Indonesia (OECD, 2008a) and South Africa (OECD, 2008b)). Furthermore, the World Bank has estimated PMR indicators for Croatia, Bulgaria, Romania and Albania, based on the OECD methodology.

ANNEX

A1. The 2008 round of PMR indicator revision

32. The PMR indicator system has now been updated to reflect the regulatory stance in 2008 and has been substantially revised.²² The objectives of this revision are twofold: First, revisions and extension of individual indicators and the methodology used to aggregate them should preserve the policy relevance of the PMR indicators by at the same time ensuring its over-time comparability. Second, this round of revision includes rather technical improvements such as to make future indicator updates more efficient, transparent and possibly more frequent than in the past, and facilitate the extension of the PMR indicator to new countries, notably the accession and enhanced engagement countries. The remainder of this section describes individual steps taken and how the individual steps impact the overall PMR indicator values.²³

Figure A1: The tree structure of the old PMR indicator



Source: OECD Regulatory Database

²² The PMR indicators were last updated to reflect policy settings in 2003. The 2008 data refer to the regulatory stance beginning of the year 2008.

²³ Another main step in the revision concerns the extension to new or evolving regulatory issues. However, since this chapter focuses on the development of regulation over time, but the "new generation PMR" would be available only for one year, this aspect of the PMR revision will be described in a companion paper.

A1.1. Improved data collection and processing

33. In the current round of the PMR indicator construction, the data collection and processing is to a much larger extent automatic than this was the case in earlier rounds. This is done such as to make future updates of the PMR indicators more timely, to reduce uncertainty in the data and to facilitate the planned extension to new member countries.

34. As in earlier rounds, the basic data used to construct the indicators of product market regulation consist of two main elements: The core part on which the database is based constitutes the responses by member countries to the multiple choice questions contained in the OECD Regulatory Indicators Questionnaire (<http://www.oecd.org/dataoecd/39/46/42122928.pdf>);²⁴ the remaining part is based on data on economy-wide and industry-specific regulations drawn from publications of the OECD or other institutions, notably the European Commission or various internet sites of national governments or regulatory agencies.

35. External sources are used for few low-level indicators, notably the tariff barriers. However, in order to improve the over-time and cross-country comparability of the final indicator, also the data used to construct the sectoral indicators are to a smaller degree based on external sources than was the case in the previous round. To this end, the questionnaire that is used to update the economy-wide indicator has now been revised in such a way as to collect equally the information for the sectoral indicators.

36. As concerns the treatment of missing values, the following rules have been applied:

- If for individual questions the 2008 replies to the questionnaire were missing, but 2003 replies were available, the 2003 replies were used assuming no change in regulation since then.²⁵
- In the case of sectoral indicators, some missing values could be filled through recourse to cross-country comparable external data. This is in particular the case for network sectors, notably telecommunications and energy markets.
- If missing replies to individual questions could not be filled through recourse to other years or external data sources, values were estimated using the available information for other questions within the same low-level indicator for the same country or – in case of missing replies for whole sub-components - the respective low-level indicator was computed from the available components or sectors.²⁶

37. In general, the responses by member countries have been quite satisfactory. At the date of print, the responses were not sufficient to construct the indicators for only three countries, Greece, Ireland and the Slovak Republic; and another six countries responded less than 80% of all questions. It has to be noted, though, that not all questions were actually used in the indicator construction, reducing the extent of cases in which missing values had to be estimated.²⁷

²⁴ The multiple choice format shifts the burden of interpreting the answer on the countries themselves, reducing the scope for discretion by the analyst. However, it does not fully eliminate comparability problems because countries may interpret the questions in different ways.

²⁵ By collecting the data for 2008, countries were also asked to revise backwards the questionnaire response for 2003 so as to control for potential revisions or inconsistencies in the data over time.

²⁶ These cases are very rare and arose only for 1998 replies. Examples are questions to regulation in retail trade or professional services, two sectors for which typically little cross-country comparable external information is available.

²⁷ About 60% of all questions from the questionnaire were used in computing the integrated PMR indicator.

A1.2. Refining individual low-level indicators

38. The revision of the PMR indicator itself starts from the old methodology as concerns the tree structure and the composition of the sub-level indicators (Figure A1), however with small improvements for some low-level indicators.²⁸

- The low-level indicators 'direct control over business enterprises' and the general provisions within the low-level indicator 'Barriers to FDI' are now computed in terms of the scope of these restrictions across sectors instead of the general yes/no reply in previous rounds. The indicator score is based on the 2008 questionnaire and retroplated to 2003 and 1998 to ensure over-time comparability.
- Within the sub-level indicator 'administrative burdens for start-ups for corporations and for sole proprietorships', the costs to set up a business were adjusted for Purchasing Power Parities (PPP) so as to improve the comparability of these data across countries. Thereby, historical PPP ratios were used in order to ensure also over-time comparability. The coding ranges were adjusted accordingly.
- The computation of the average tariffs uses now more detailed data and a more elaborated technique than had been done in the earlier round of the PMR indicator construction where simple average tariff rates were taken directly from the TRAINS database. The computation of the new average tariffs starts on the 6-digit level of the Harmonised System (HS) product classification, with tariffs being defined as the *ad valorem* tariff rates applied to the most favoured nation. Tariff data have been aggregated into indicators for 2-digit ISIC Rev. 3 industries using import-based weights, similarly as has been done in Nicoletti and Scarpetta (2003).²⁹

A1.3. On the revision of the weighting technique

39. An appropriate weighting technique should result in an aggregate PMR indicator that remains comparable across countries and over time even if there are changes in the underlying data. The weighting system should, therefore, be such that variation over time of overall country scores and notably country rankings should reflect changes in the regulatory policies only and not changes in factors unrelated to policy that may affect the weights. The basic regulatory data change every time the PMR indicator is being updated. Also, country coverage changes with OECD membership, the wish to include non-members or sometimes as a function of response rates to the questionnaire. Furthermore, embodying new regulatory dimensions relevant for competition into the PMR implies changing its structure, *e.g.* adding new low-level indicators, which need to be weighted appropriately.

40. In the 2003 round of PMR updating the aggregate PMR was computed using constant weights obtained via Principal Component Analysis (PCA) performed on 1998 data. The PCA methodology groups together lower-level indicators that are most associated with different underlying (unobserved) principal components.³⁰ However, the 1998 weights that were used then are no longer appropriate for three main

²⁸ Besides the mentioned improvements, it is also planned to revise the indicator component on the regulation of shop opening hours based on the substantially revised section in the 2008 OECD Regulatory Indicators Questionnaire. Time constraints did not allow to make this revision for this paper.

²⁹ The weights use the sum of all imports of OECD countries instead of national imports as weights in order to avoid potential problems of endogeneity.

³⁰ In practice, the PCA weighting approach entails that within each such sub-domain, the lower-level indicators are weighted according to the proportion of the cross-country variance in the data accounted for

reasons. First, over the 1998-2008 period the regulatory data on which the 1998 principal component analysis was undertaken have changed radically; the weights would, therefore, be based on policy environments that are no longer representative. Second, the 1998 weights may not reflect the relative importance of particular sub-level indicators for the overall indicator in all member countries: due to various reasons, the PCA was originally conducted on a subset of 21 OECD countries only. Most importantly, the 2008 round of PMR update involves extensions in country coverage and indicator structure that would make it impossible to apply again the 1998 weights.

41. The revised indicators apply Equal Weights (EW) to compute the 2008 PMR as well as to recompute retrospectively PMR for 1998 and 2003. Equal Weights attribute within each domain to each single sub-level indicator the same importance in the overall regulatory stance. Thus, EW share with PCA weights the risk of not appropriately reflecting the relative economic importance of the various policies. However, an aggregation methodology based on Equal Weights within each regulatory domain would make ranking of countries less insensitive to changes in the underlying data, *i.e.* to year and country coverage, and less sensitive to changes in the underlying indicator structure than PCA weights. This was the result of a comprehensive analysis that has been implemented to test the sensitivity of the PMR indicator scores and the resulting country rankings to different weighting techniques, scoring ranges, nesting structures, and aggregation methods (see section A.1.5 for the impact of the change in the weighting technique on the indicator).

A1.4. Integration of previously separate indicators

42. The second major improvement in the current round of the indicator construction is that previously separate indicators have been integrated into one single comprehensive PMR indicator. This should enable and facilitate the analysis of changes in individual regulatory policies in OECD countries and their impact on overall regulatory stance. The indicators concerned are the indicators of regulation in non-manufacturing sectors (NMR indicators) as well as the FDI-restrictiveness indicator. The structure and coverage of these indicators is described in detail in Conway and Nicoletti (2006) and Golub (2003), Golub and Koyama (2006), respectively.

43. The NMR indicators comprise two broad groups of sectors.³¹ These are first, the network sectors Energy (electricity and gas), Transport (air, rail and road transport), and Communication (post and telecommunications) (ETCR); these ETCR indicators are computed for a time series from 1975 to 2008. The second group covers regulation in retail trade and professional services; the indicators for these two sectors are – like the aggregate PMR indicator – computed for 1998, 2003 and 2008.

44. The construction of the NMR indicators follows the same bottom-up approach as for the economy-wide PMR indicator. Qualitative and – to a smaller extent – quantitative information is summarised in low-level indicators that are then aggregated stepwise into an aggregate indicator for each sector. Indicators for retail distribution and professional services are based exclusively on country replies to the OECD Regulatory Indicators Questionnaire. The ETCR components of the NMR indicators were

by the component that is explained by them. In the original principal component analysis, the factor loadings are computed as the leading eigenvectors from the data correlation matrix and rescaled to have unit length. The loading vectors are rotated in order to maximise the sum of the variances and the weights calculated as the normalised squared loadings. As a consequence the obtained weights put emphasis on variables displaying a large degree of co-movement with other variables, while due to the rescaling the relative variance of each single variable is irrelevant for the loadings and in consequence the weights.

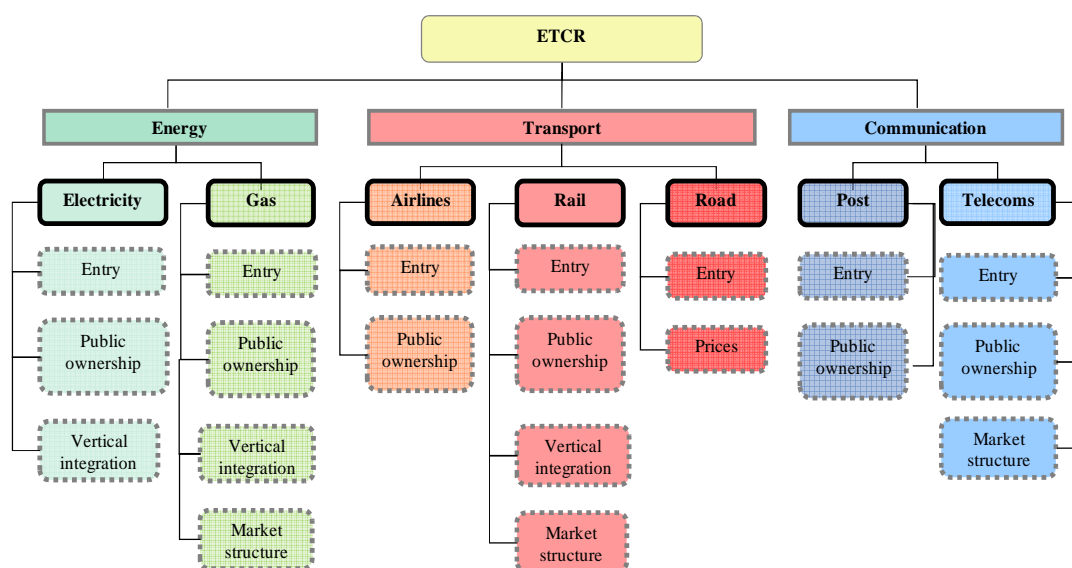
³¹ Differences in coverage of regulatory areas by sector reflect a compromise between sector-specific economic relevance of each area and data availability for a sufficiently large set of OECD countries (Conway and Nicoletti, 2006).

originally based to a much larger extent on external data sources, but the relevant information is also currently covered to a large extent by the OECD Questionnaire. Furthermore, the NMR indicators used already earlier equal weights for aggregation (within regulatory domains and sectors). Figure A2 shows the tree structure of the NMR indicators.

45. The OECD FDI regulatory restrictiveness index (FDI-indicator) measures different forms of discrimination against foreign firms, such as *i*) restrictions on foreign ownership, *i.e.* limitations of the share of companies' equity capital in a particular sector that are not applied to domestic firms; *ii*) obligatory screening and approval procedures for foreign affiliates; *iii*) operational constraints or controls for affiliates of foreign companies, including constraints to the mobility of foreign professionals working in these affiliates. The FDI indicator is – similar to the PMR and the NMR indicators – constructed using a bottom-up approach covering a large number of business sectors (manufacturing, construction, electricity and 9 services sectors) with a focus on services. The FDI indicator is primarily based on information from the GATS Commitments and country submissions to the OECD Code of Liberalisation of Capital Movements.³²

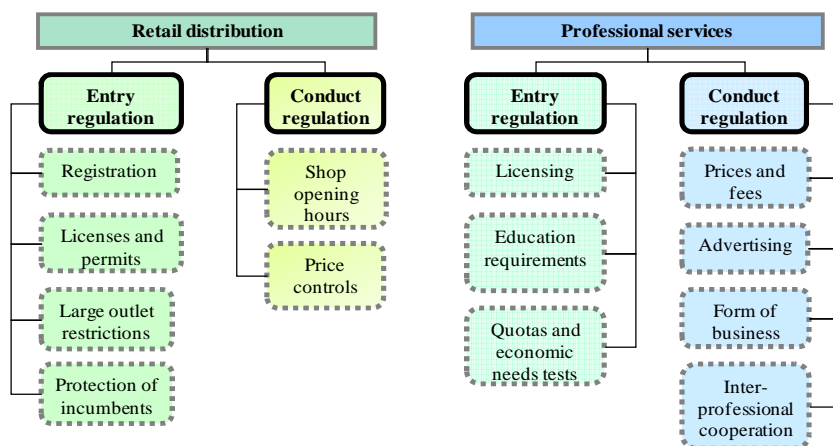
Figure A2: The tree structure of the NMR indicators

Panel A: The indicators for regulation in network sectors (ETCR)



³² This indicator is currently updated by the OECD Directorate for Financial Affairs in co-operation with the OECD Economics Department.

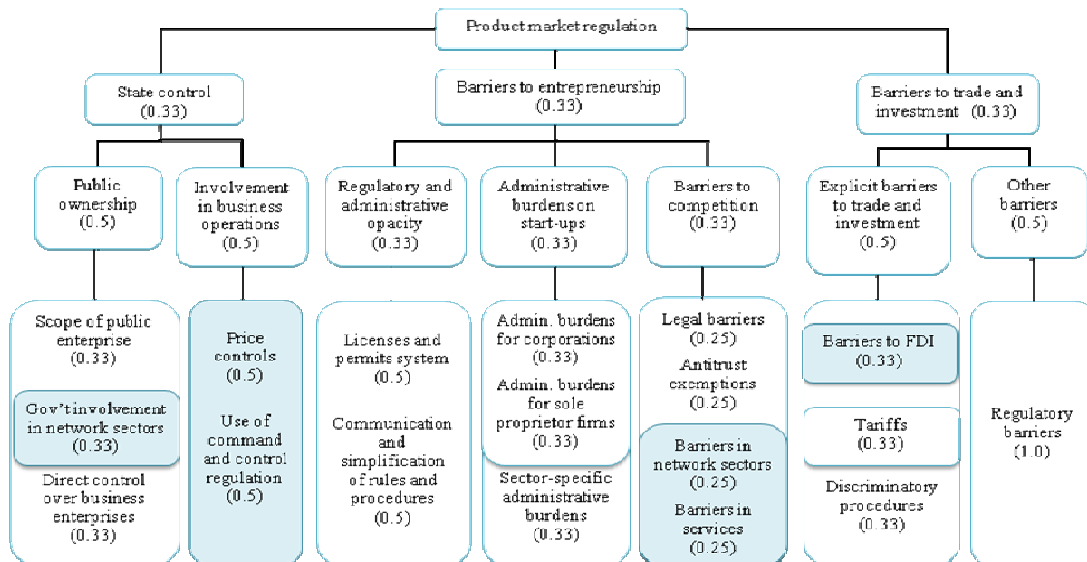
Panel B: The indicators for regulation in retail trade and professional services



Source: OECD Regulatory Database

46. Figure A3 shows the tree structure of the "integrated PMR indicator", i.e. integrating previously separated indicators and thus covering to a larger extent information on regulation in particular sectors. As in Figure A1, the numbers in brackets denote the (equal) weights with which each low-level indicator, sub-domain or domain enters the PMR indicator.

Figure A3: The tree structure of the "integrated PMR indicator"



Source: OECD Regulatory Database

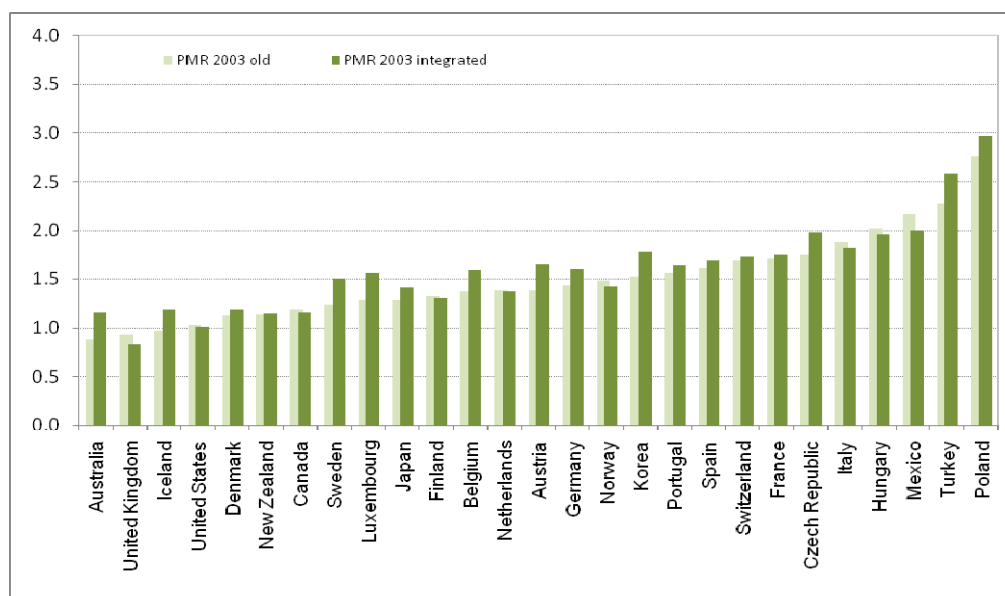
47. In Figure A3, the areas that are shaded reflect the low-level indicator in which data from the NMR indicator or the FDI restrictiveness indicator are incorporated. This is in more detail:

- The indicator 'Government involvement in network sectors' substitutes the indicator 'size of public enterprise sector' that was used previously within the domain 'state control'. The indicator 'Government involvement in network sectors' generally measures the percentage in overall equity of the largest firm in these sectors that is owned by the government.³³
- The indicators 'Vertical integration', and 'Barriers to entry in network sectors' together constitute a new sub-level indicator of 'Barriers (to entry) in network sectors'. And the new sub-level indicators 'Barriers (to entry) in network sectors' and 'Barriers (to entry) in services' (retail and professional services) constitute new indicators in the domain 'Barriers to entrepreneurship'.
- In the case of 'Price controls' and 'Use of command and control regulation', sector information had already been covered to some extent in the economy-wide indicator in past versions of the PMR; these indicators cover now equally information on additional sectors, notably professional services and retail trade.
- The indicator 'Barriers to FDI' integrates now the sector-specific information from the FDI restrictiveness indicator.

A1.5. The impact of the revisions on the PMR indicator

48. Figure A4 compares for 2003 the integrated PMR indicator with the indicator previously estimated by Conway *et al.* (2005). The grouping into countries with relatively liberal regulation in 2003 (such as the United Kingdom, the United States, Australia, Iceland, Denmark, New Zealand and Canada) and countries with relatively restrictive regulation (such as Poland, Turkey, Mexico, and Hungary) remains broadly unchanged. However, regulatory scores change in several countries, mainly due to data revisions and the incorporation of additional sectoral information. As a result, Australia, Iceland, Sweden, Luxembourg, Japan, Austria, and Turkey fall slightly behind, while New Zealand, Canada, Italy and Mexico gain some positions relative to the PMR estimate according to the 2003 methodology.

³³ The indicator "Scope of public enterprises" measures the fraction of sectors in which there is at least one state-controlled firm while the indicator "Government involvement in network sectors" measures how much of these firms is owned by the government. Together, both indicators can be seen as a proxy for the size of the public enterprise sector in the economy

Figure A4: Comparing the old PMR with the revised “integrated indicator” for 2003

Source: OECD Regulatory Database

49. Figure A5 illustrates in more detail how the different steps of the 2008 revision of the PMR indicator impact on the indicator scores across countries. It concentrates on two main areas of revision,

- the change in the weighting technique used, comparing the "old" PMR indicator based on PCA weights with the "old" PMR based on equal weights,
- the integration of previously separate (NMR and FDI) indicators in order to extend the sectoral coverage of the PMR indicator; the reference scenario being the "old" PMR indicator, but based on equal weights instead of PCA.

50. Figure A5 suggests three main results:

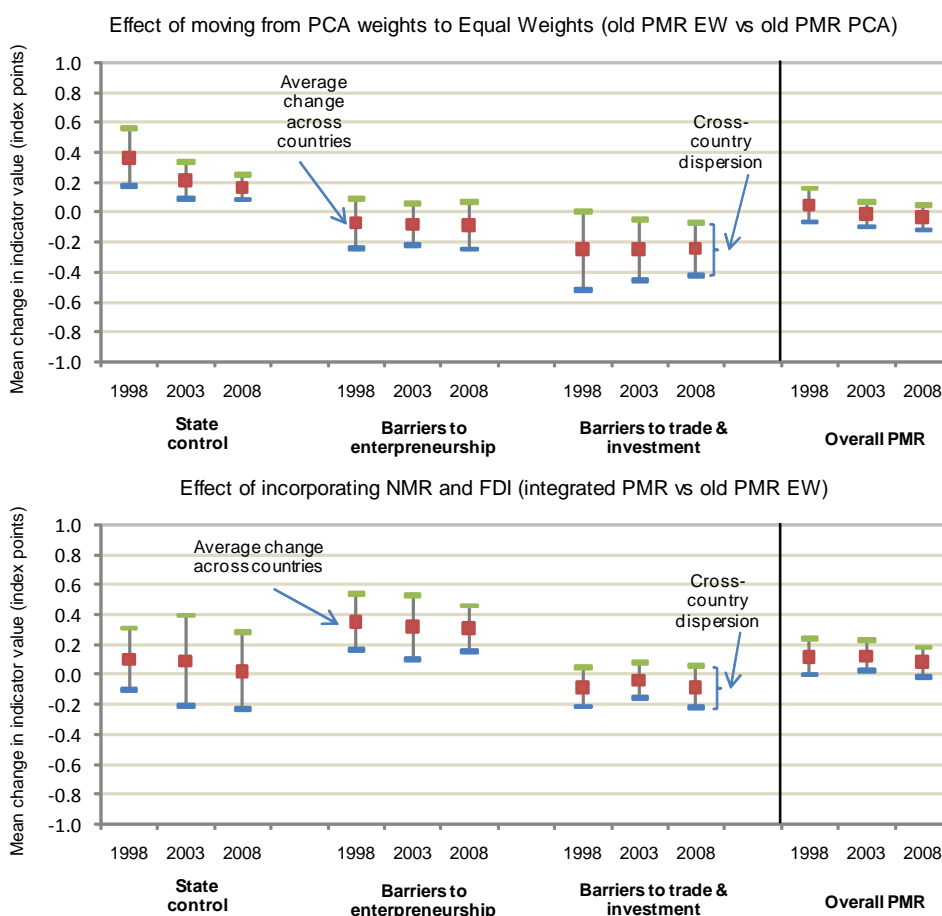
- In general, the average impact of the individual revisions on the PMR indicator is relatively small; it ranges in absolute terms between 0 and 0.4 index points and this is in particular the case at the aggregate PMR level. Furthermore, the impacts are relatively uniform over time.³⁴
- Small changes on the aggregate result partly from compensating effects across domains and revisions. For instance, using EW instead of PCA reduces the overall values of the domain barriers of entrepreneurship. However, this effect is more than compensated by integrating sectoral information on barriers to entry in network sectors and in particular barriers to entry in services that raise the indicator values in the same domain.

³⁴

The stronger average impacts and the larger dispersion across countries in the case of the new generation PMR may also reflect data problems. It has to be noted that in the case of state control and the barriers to trade and investment, only a small subset of countries are covered. The results presented here may thus not be representative for all OECD countries.

- Finally, the impact of the different revisions is not uniform across countries, generally increasing in indicator values. Moreover, the extent to which the impacts differ across countries depends on the type of revision, the regulatory domains and the time period. This can be illustrated in the figure that plots the impact on the indicator values from integrating sectoral information into the economy-wide PMR indicator: The relatively large impact on dispersion in the domain 'state control' suggests that countries differ strongly in terms of state ownership of enterprises in network sectors, while the relatively small dispersion in the domain barriers to entrepreneurship reflect that barriers to entry in network sectors and in services remain high in almost all OECD countries.

Figure A5: Impact of the steps of revision on the PMR indicator, 1998, 2003, 2008



1. The cross-country dispersion is measured by difference between the upper and lower 10th percentiles of the cross-country distribution.
2. Averages and dispersion across those countries for which data are available respectively.

Source: OECD Regulatory Database

A2. Detailed tests of differences in regulatory environments across countries and over time

51. Tables A1 and A2 present detailed tests of significant differences in aggregate product market regulation for OECD country pairs using the CPD approach (Box 3, main text). In general, the tables are to be read as follows: For instance, in 1998 (Table A1) Sweden was characterised by a regulatory environment that was significantly more restrictive than the one of the United States, as can be seen from the plus in brackets in the USA-SWE cell in the first line. In contrast, the regulatory environment in Sweden was significantly less restrictive than the one in Poland as can be seen from the minus in brackets in the POL-SWE cell in the bottom line. In both cases, the level of significance is 99% as reflected in the three stars above the brackets. Two stars would represent 95% and one star 90% confidence levels.

52. Table A1 also shows the development in bilateral tests of significant differences over time, the benchmark values and the country ranking being those of 1998. In the table, the non-shaded filled areas show the country-pairs for which regulation was significantly different from each other in 1998. As a comparison, the shaded areas represent country pairs that show significantly different regulatory environments in 2008. The results suggest a clear pattern of significant country pairs away from the center, reflecting that over time middle-of-the-road countries are becoming less different from each other, while it is only the very restrictive or very liberal countries that differentiate themselves from the other countries throughout the whole period. This pattern is in line with the convergence in regulatory environments across countries over time, leading to increasing difficulties to statistically distinguish countries according to their regulatory stance.

53. Table A2 shows that for a certain number of countries (reflected by shaded areas) the regulatory stance is significantly different from the one of other countries after NMR and FDI restrictiveness indicators are integrated, but not before (or only with low confidence level).³⁵ As this integration implies adding information on sectoral regulation, these shaded areas suggest stronger cross-country differences in sectoral regulation as compared to economy-wide regulation. At the same time, Table A2 suggests that integrating information on sectoral regulation helps to better differentiate countries' regulatory environments across countries. Moreover, this appears to be notably the case for middle-of-the-road countries, reflected in shaded areas for those countries (Australia, Switzerland, Sweden Germany, Italy, Hungary, Austria, Belgium, France, Korea and Portugal).

³⁵ Like in Table A1, also in Table A2 the values and the ranking of the countries are according to the 1998 PMR indicator scores.

Table A1: Changes in cross-country differences in PMR over time¹

	USA	GBR	CAN	NZL	AUS	DEN	NLD	ICE	NOR	SWE	GER	FIN	BEL	JAP	AUT	PRT	HUN	KOR	MEX	CHE	FRA	ESP	ITA	CZE	TUR	POL	
USA	.				(+)*		(+)**	(+)**	(+)**	(+)**	(+)**	(+)**	(+)**	(+)**	(+)**	(+)**	(+)**	(+)**	(+)**	(+)**	(+)**	(+)**	(+)**	(+)**	(+)**	(+)**	(+)**
GBR		.							(+)**	(+)*	(+)**	(+)**	(+)**	(+)**	(+)**	(+)**	(+)**	(+)**	(+)**	(+)**	(+)**	(+)**	(+)**	(+)**	(+)**	(+)**	(+)**
CAN			.						(+)*	(+)*	(+)**	(+)**	(+)**	(+)**	(+)**	(+)**	(+)**	(+)**	(+)**	(+)**	(+)**	(+)**	(+)**	(+)**	(+)**	(+)**	(+)**
NZL				.					(+)*	(+)*	(+)**	(+)**	(+)**	(+)**	(+)**	(+)**	(+)**	(+)**	(+)**	(+)**	(+)**	(+)**	(+)**	(+)**	(+)**	(+)**	(+)**
AUS	(-)*				.					(+)**	(+)**			(+)*	(+)**	(+)**	(+)**	(+)*	(+)**	(+)**	(+)**	(+)**	(+)**	(+)**	(+)**	(+)**	(+)**
DEN						.								(+)*	(+)*	(+)*			(+)**	(+)*	(+)**	(+)**	(+)**	(+)**	(+)**	(+)**	(+)**
NLD	(-)**						.				(+)*			(+)*	(+)**	(+)*			(+)**	(+)*	(+)**	(+)**	(+)**	(+)**	(+)**	(+)**	(+)**
ICE	(-)**							.						(+)*	(+)*	(+)*			(+)**	(+)*	(+)**	(+)**	(+)**	(+)**	(+)**	(+)**	(+)**
NOR	(-)**	(-)**	(-)*	(-)*					.										(+)**	(+)*	(+)*	(+)**	(+)**	(+)**	(+)**	(+)**	(+)**
SWE	(-)**	(-)*	(-)*	(-)*						.														(+)**	(+)**	(+)**	(+)**
GER	(-)**	(-)**	(-)**	(-)**	(-)**						.													(+)*	(+)**	(+)**	(+)**
FIN	(-)**	(-)**	(-)**	(-)**	(-)**	(-)*						.												(+)*	(+)**	(+)**	(+)**
BEL	(-)**	(-)**	(-)**	(-)**									.												(+)**	(+)**	(+)**
JAP	(-)**	(-)**	(-)**	(-)**	(-)*									.											(+)**	(+)**	(+)**
AUT	(-)**	(-)**	(-)**	(-)**	(-)**	(-)*	(-)*	(-)*							.										(+)**	(+)**	(+)**
PRT	(-)**	(-)**	(-)**	(-)**	(-)**	(-)*	(-)**	(-)*								.									(+)**	(+)**	(+)**
HUN	(-)**	(-)**	(-)**	(-)**	(-)**	(-)*	(-)*	(-)*									.								(+)**	(+)**	(+)**
KOR	(-)**	(-)**	(-)**	(-)**	(-)*													.							(+)*	(+)**	(+)**
MEX	(-)**	(-)**	(-)**	(-)**	(-)**	(-)**	(-)**	(-)**	(-)**											.					(+)**	(+)**	(+)**
CHE	(-)**	(-)**	(-)**	(-)**	(-)**	(-)*	(-)*	(-)*													.				(+)**	(+)**	(+)**
FRA	(-)**	(-)**	(-)**	(-)**	(-)**	(-)**	(-)**	(-)**	(-)**													.			(+)**	(+)**	(+)**
ESP	(-)**	(-)**	(-)**	(-)**	(-)**	(-)**	(-)**	(-)**	(-)**	(-)*													.		(+)**	(+)**	(+)**
ITA	(-)**	(-)**	(-)**	(-)**	(-)**	(-)**	(-)**	(-)**	(-)**	(-)**														.	(+)**	(+)**	(+)**
CZE	(-)**	(-)**	(-)**	(-)**	(-)**	(-)**	(-)**	(-)**	(-)**	(-)**	(-)**	(-)**	(-)**	(-)**	(-)**	(-)**	(-)**	(-)**	(-)**	(-)**	(-)**	(-)**	(-)**	(-)**	.	(+)**	(+)**
TUR	(-)**	(-)**	(-)**	(-)**	(-)**	(-)**	(-)**	(-)**	(-)**	(-)**	(-)**	(-)**	(-)**	(-)**	(-)**	(-)**	(-)**	(-)**	(-)**	(-)**	(-)**	(-)**	(-)**	(-)**	(-)**	.	(+)**
POL	(-)**	(-)**	(-)**	(-)**	(-)**	(-)**	(-)**	(-)**	(-)**	(-)**	(-)**	(-)**	(-)**	(-)**	(-)**	(-)**	(-)**	(-)**	(-)**	(-)**	(-)**	(-)**	(-)**	(-)**	(-)**	(-)**	.

1. The stars above the brackets denote the level of significance: *: 90 %, **: 95 %, ***: 99 %. The values presented and the country-ranking are those of 1998. The non-shaded cells show the country-pairs with significantly different regulation from each other in 1998, but not significant anymore in 2008. The shaded areas represent country pairs with significantly different regulatory environments in 2008.

Source: OECD Regulatory Database, 2008.

Table A2: The impact of integrating additional sectoral information, 2008¹

	USA	GBR	CAN	NLD	ICE	DEN	ESP	JAP	NOR	FIN	AUS	NZL	CHE	HUN	SWE	GER	AUT	ITA	BEL	PRT	FRA	KOR	LUX	CZE	MEX	TUR	POL		
USA													(+)*			(+)*	(+)*	(+)*	(+)*	(+)**	(+)**	(+)**	(+)**	(+)**	(+)**	(+)**	(+)**	(+)**	
GBR											(+)*		(+)**	(+)*	(+)*	(+)**	(+)*	(+)**	(+)**	(+)**	(+)**	(+)**	(+)**	(+)**	(+)**	(+)**	(+)**	(+)**	
CAN																				(+)*	(+)**		(+)**	(+)**	(+)**	(+)**	(+)**	(+)**	
NLD																		(+)*	(+)*	(+)**	(+)**		(+)**	(+)**	(+)**	(+)**	(+)**	(+)**	
ICE																							(+)**	(+)**	(+)*	(+)**	(+)**	(+)**	
DEN																					(+)*		(+)**	(+)**	(+)*	(+)**	(+)**	(+)**	
ESP																					(+)*		(+)**	(+)**	(+)*	(+)**	(+)**	(+)**	
JAP																							(+)*	(+)*		(+)**	(+)**	(+)**	
NOR																							(+)*	(+)*		(+)**	(+)**	(+)**	
FIN																							(+)**	(+)*		(+)**	(+)**	(+)**	
AUS		(-)*																					(+)*			(+)**	(+)**	(+)**	
NZL																										(+)**	(+)**	(+)**	
CHE	(-)*	(-)**																								(+)**	(+)**	(+)**	
HUN		(-)*																								(+)**	(+)**	(+)**	
SWE		(-)*																								(+)**	(+)**	(+)**	
GER	(-)*	(-)**																								(+)**	(+)**	(+)**	
AUT	(-)*	(-)*																								(+)**	(+)**	(+)**	
ITA	(-)*	(-)**		(-)*																						(+)**	(+)**	(+)**	
BEL	(-)*	(-)**		(-)*																						(+)**	(+)**	(+)**	
PRT	(-)**	(-)**	(-)*	(-)**																						(+)**	(+)**	(+)**	
FRA	(-)**	(-)**	(-)**	(-)**		(-)*	(-)*																			(+)**	(+)**	(+)**	
KOR	(-)*	(-)*																								(+)**	(+)**	(+)**	
LUX	(-)**	(-)**	(-)**	(-)**	(-)**	(-)**	(-)**	(-)*	(-)*	(-)**	(-)*															(+)**	(+)**	(+)**	
CZE	(-)**	(-)**	(-)**	(-)**	(-)**	(-)**	(-)**	(-)*	(-)*	(-)*																(+)**	(+)**	(+)**	
MEX	(-)*	(-)**	(-)**	(-)**	(-)*	(-)*	(-)*																			(+)**	(+)**	(+)**	
TUR	(-)**	(-)**	(-)**	(-)**	(-)**	(-)**	(-)**	(-)**	(-)**	(-)**	(-)**	(-)**	(-)**	(-)**	(-)**	(-)**	(-)**	(-)**	(-)**	(-)**	(-)**	(-)**	(-)**	(-)**	(-)**	(-)**	(-)**	(-)**	(-)**
POL	(-)**	(-)**	(-)**	(-)**	(-)**	(-)**	(-)**	(-)**	(-)**	(-)**	(-)**	(-)**	(-)**	(-)**	(-)**	(-)**	(-)**	(-)**	(-)**	(-)**	(-)**	(-)**	(-)**	(-)**	(-)**	(-)**	(-)**	(-)**	(-)**

1. The shaded areas represent country-pairs for which the regulatory stance is significantly different from each other after NMR and FDI restrictiveness indicators are integrated, but not before (or only with low confidence level). The stars above the brackets denote the level of significance: *, 90 %, **, 95 %, ***, 99 %.

Source: OECD Regulatory Database

A3. Schemata of the low-level indicators

A3.1. State Control

Table 1. Integrated PMR indicator, low-level indicator: Scope of public enterprise sector

National, state or provincial government controls at least one firm in:			Coding of answers	
ISIC (Rev. 3.1) code	Sector	Weight (a _i)	Yes	No
16	Manufacture of tobacco products	1	6	0
232	Manufacture of refined petroleum products	1	6	0
27	Manufacture of basic metals	1	6	0
28, 29	Manufacture of fabricated metal products, machinery and equipment	1	6	0
4010	Electricity: electricity generation/import or electricity transmission or electricity distribution or electricity supply	1	6	0
4020	Gas: gas production/import or gas transmission or gas distribution or gas supply	1	6	0
4100	Collection, purification and distribution of water	1	6	0
50, 51	Wholesale trade, incl. motor vehicles	1	6	0
55	Restaurant and hotels	1	6	0
601, 6303	Railw ays: Passenger transport via railw ays, Freight transport via railw ays, Operation of railroad infrastructure	1	6	0
6021	Other urban, suburban and interurban passenger transport	1	6	0
6021	Other scheduled passenger land transport	1	6	0
6023	Freight transport by road	1	6	0
6303	Operation of road infrastructure	1	6	0
61	Water transport	1	6	0
6303	Operation of w ater transport infrastructure	1	6	0
62	Air transport	1	6	0
6303	Operation of air transport infrastructure	1	6	0
642	Telecommunication: fixed line services, mobile services, internet services.	1	6	0
6519, 659, 671	Financial institutions	1	6	0
66, 672	Insurance	1	6	0
74	Other business activity	1	6	0
851	Human health activities	1	6	0
9211, 9212	Motion picture distribution and projection	1	6	0
Country score (0-6)			($\sum a_i \text{ answer}_i$)/ $\sum a_i$	

Note: The indicator is computed only if at least 20 data points are available.

Network industries:

Electricity: a YES is recorded if national, state or provincial government controls at least one firm in any of the following sectors: electricity generation/import, electricity transmission, electricity distribution/supply.

Gas: a YES is recorded if national, state or provincial government controls at least one firm in any of the following sectors: gas production/import, gas transmission, gas distribution/supply.

Railw ays: a YES is recorded if national, state or provincial government controls at least one firm in any of the following sectors: passenger transport via railw ays, freight transport via railw ays, operation of railroad infrastructure.

Telecommunication: a YES is recorded if national, state or provincial government controls at least one firm in any of the following sectors: fixed line services, mobile services, internet services.

Table 2. **Integrated PMR indicator, low-level indicator: Government involvement in network sector**

	<i>Industry weight (b_j)</i>	<i>Question weight (c_k)</i>	Coding of answers					
Gas industry	1/6							
What percentage of shares in the largest firm in the gas production/import sector are owned by government?		1/3	None 0	Between 0 and 100 % 3	100% 6			
What percentage of shares in the largest firm in the gas transmission sector are owned by government?		1/3	0	3	6			
What percentage of shares in the largest firm in the gas distribution sector are owned by government?		1/3	0	3	6			
Electricity industry	1/6							
What is the ownership structure of the largest companies in the generation, transmission, distribution, and supply segments of the electricity industry?		1	Private 0	Mostly Private 1.5	Mixed 3	Mostly Public 4.5	Public 6	
Rail transport	1/6							
What percentage of shares in the largest firm in operation of infrastructure sector is owned by government?		1/3	No public ownership 0	Between 0 and 100 % 3	100% 6			
What percentage of shares in the largest firm in passenger transport sector is owned by government?		1/3	0	3	6			
What percentage of shares in the largest firm in freight transport sector is owned by government?		1/3	0	3	6			
Air transport	1/6							
What percentage of shares in the largest carrier (domestic and international traffic combined) are owned by national, state or provincial authorities?		1	% of shares owned by government / 100 * 6					
Postal services	1/6							
What percentage of shares in the largest firm in the sector: "basic letter services" are owned by the government?		1/3	None 0	Between 0 and 100 % 3	100% 6			
What percentage of shares in the largest firm in the sector: "basic parcel services" are owned by the government?		1/3	0	3	6			
What is the extent of public ownership in the courier (activities other than national post) sector?		1/3	No Govt involvement in sector 0	Govt. controls at least 1 firm, but other firms operate as well 3	Govt controls all dominant firms in sector 6			
Telecommunication ¹	1/6							
What percentage of shares in the PTO are owned by government?		1-w ^m	% government ownership / 100 * 6					
What percentage of shares in the largest firm in the mobile telecommunications sector are owned by government?		w ^m	% government ownership / 100 * 6					
Country scores (0-6)		$\sum_j b_j \sum_k c_k \text{ answer}_{jk}$						

1 "PTO" stands for "Public telecommunications operator". The weight w^m is the 1998 and 2003 OECD-wide revenue share from mobile telephony in total revenue from trunk, international, and mobile.

Table 3. Integrated PMR indicator, low-level indicator: Direct control over business enterprises

	Question weight	Sub-question weight	Coding of answers	
	b_i	a_i	Yes	No
General constraints				
There are any legal or constitutional constraints to the sale of the stakes held by government in publicly-controlled firms	0.3*s _i		6	0
Strategic choices of any publicly-controlled firms have to be reviewed and/or cleared in advance by national, state, or provincial legislatures	0.2*s _i		6	0
Golden shares				
National, state or provincial governments have special voting rights (e.g. golden shares) in any firms within the business sector	0.25		6	0
Extent of the special voting rights				
These special rights can be exercised in:	0.25			
- merger with or acquisition by another company		1/4	6	0
- change in controlling coalition		1/4	6	0
- choice of management		1/4	6	0
- strategic management decisions		1/4	6	0
Country scores (0-6)			$\sum_{i=1}^3 b_i \cdot answer_i + b_4 \cdot \sum_i a_i \cdot answer_i$	
Note: s _i : % of business sectors in which the state controls at least one firm.				
Missing data point rules:				
- if the circumstances under which a special voting right can be exercised are not known only the existence of the special voting right is taken into account to compute the golden share element.				
- if no data are available concerning the strategic choices only the data concerning the legal and constitutional constraints are taken into account with a weight of 50%				

Table 4. Integrated PMR indicator, low-level indicator: Price controls

	Industry weight (<i>b_j</i>)	Question weight (<i>c_k</i>)	Coding of answers						
			Yes			No			
Air travel	1/5								
Prices of domestic air fares are regulated		1/2	6			0			
Number of 5 or 4 busiest international routes subject to price regulation (n)		1/2	(n/5)*6 or (n/4)*6						
Road freight	1/5								
Retail prices of road freight services are regulated in any way by the government		1/3	6			0			
Government provides pricing guidelines to road freight companies		1/3	6			0			
Professional bodies or representatives of trade and commercial interests are involved in specifying or enforcing pricing guidelines or regulations		1/3	6			0			
Retail distribution	1/5								
Retail prices of the following products are subject to price controls:									
- Retail prices of certain staples (e.g. milk and bread)		1/6	6			0			
- Retail prices of gasoline		1/6	6			0			
- Retail prices of tobacco		1/6	6			0			
- Retail prices of alcohol		1/6	6			0			
- Retail prices of pharmaceuticals		1/6	6			0			
- Retail prices of other product		1/6	6			0			
Telecommunication	1/5								
Retail prices of digital mobile service in telecommunications are regulated		1	6			0			
Professional services ¹	1/5								
<i>Regulations on prices and fees: Are the fees or prices that a profession charges regulated in any way (by government or self-regulated)?</i>			no regulation	no non-binding recommended prices on some services	no non-binding recommended prices on all services	maximum prices on some services	maximum prices on all services	minimum prices on some services	minimum prices on all services
			0	1	2	3	4	5	6
Country scores (0-6)	$\sum_j b_j \sum_k c_k \text{ answer}_{jk}$								

1. Average of available professional services.

Note: Missing data point:

- in the case of missing data in the sub-element of air travel or road freight a simple average of the available data points is used.
- in the case of missing data in the types of retail price controls, a simple average of the available data points is used.
- the overall indicator is a simple average of the available sub-elements (air travel, road freight, retail trade, telecommunication, professional services).

Table 5. Integrated PMR indicator, low-level indicator: Use of command and control regulation

	Topic weight (a _i)	Industry weight (b _j)	Question weight (c _k)	Coding of answers			
				Yes	No		
General information	1/2						
Regulators are required to assess alternative policy instruments (regulatory and non-regulatory) before adopting new regulation			1/2	0			6
Guidance has been issued on using alternatives to traditional regulation			1/2	0			6
Sector-specific information	1/2						
Road freight		1/5					
Regulations prevent or constrain backhauling (picking up freight on the return leg)			1/4	6			0
Regulations prevent or constrain private carriage (transport only for own account)			1/4	6			0
Regulations prevent or constrain contract carriage (contractual relation between an otherwise independent hauler and one shipper)			1/4	6			0
Regulations prevent or constrain intermodal operations (operating or ownership links between firms in different transportation sectors)			1/4	6			0
Retail distribution		1/5					
Shop opening hours are regulated			2/3	6			0
Government regulations on shop opening hours apply at national level			1/3	6			0
Air travel		1/5					
Carriers operating on domestic routes are subject to universal service requirements (e.g. obligation to serve specified customers or areas)			1	6			0
Railways		1/5					
Companies operating the infrastructure or providing railway services are subject to universal service requirements (e.g. obligation to serve specified customers or areas)			1	6			0
Professional services¹		1/5					
<i>Regulations on advertising: Is advertising and marketing by the profession regulated in any way?</i>			1/3	no specific regulations	advertising is regulated		advertising is prohibited
				0	3		6
<i>Regulation on form of business: Is the legal form of business restricted to a particular type?</i>			1/3	no restrictions	some incorporation allowed	incorporation forbidden	sole practitioner only
				0	2	5	6
<i>Inter-professional cooperation: Is cooperation between professionals restricted?</i>			1/3	all forms allowed	generally allowed	allowed with comparable professions	generally forbidden
				0	3	4.5	6

Country scores (0-6)

$$\sum_i a_i \sum_j b_j \sum_k c_k \text{answer}_{ijk}$$

1. Average of indicators for individual professional services (accounting, legal, architecture, engineering).

Note: In case of missing data points, the sector-specific element is a simple average of the available sectoral sub-elements.

A3.2. *Barriers to Entrepreneurship*

Table 6. Integrated PMR indicator, low-level indicator: Licenses and permits system

	Question weight (c_k)	Coding of answers	
		Yes	No
The 'silence is consent' rule (i.e. that licenses are issued automatically if the competent licensing office has not acted by the end of the statutory response period) is used at all	1/3	0	6
There are single contact points ("one-stop shops") for getting information on notifications and licenses	1/3	0	6
There are single contact points ("one-stop shops") for issuing or accepting on notifications and licenses	1/3	0	6
Country scores (0-6)	$\sum_k c_k \text{ answer}_{jk}$		

Note: Missing data points: if at least two of the three data points are available, the indicator is calculated as a simple average of the available data points.

Table 7. **Integrated PMR indicator, low-level indicator: Communication and simplification of rules and procedures**

	<i>Theme weight (b_j)</i>	<i>Question weight (c_k)</i>	Coding of answers	
			Yes	No
Communication¹	1/2			
There are systematic procedures for making regulations known and accessible to affected parties		2/12	0	6
There is a general policy requiring "plain language" drafting of regulation		1/12	0	6
There are inquiry points where affected or interested foreign parties can get information on the operation and enforcement of regulations		3/12	0	6
Affected parties have the right to appeal against adverse enforcement decisions in individual cases		4/12	Yes or in all cases 0	In some cases 3 No 6
Government policy imposes specific requirements in relation to transparency/freedom of information government wide		2/12	Yes 0	No 3 6
Simplification²	1/2*W			
National government (all ministries and agencies) keeps a complete count of the number of permits and licenses required		1/3	0	6
There is an explicit program to reduce the administrative burdens imposed by government on enterprises and/or citizens		1/3	0	6
There is a program underway to review and reduce the number of licenses and permits required by the national government		1/3	0	6
Country scores (0-6)	$\sum_j b_j \sum_k c_k \text{ answer}_{jk}$			

Note: $W = W_i / \text{Max } W_{98}$; W_i is a simple average of the indicator scores of administrative burdens on corporations, administrative burdens on sole proprietor firms, sector-specific administrative burdens, and communication.

Missing data point:

- for the simplification element: if at least two of the three data points are available, a simple average of the available data is used,
- for the communication element: if at least four data points are available, a weighted average of the available data is used.

Table 8. **Integrated PMR indicator, low-level indicator: Administrative burdens for corporations**

	Weight (c_k)	Coding of answers						
		0	1	2	3	4	5	6
Number of mandatory procedures required to register a public limited company (pre-registration+registration)	1/4	<=4	<=7	<=12	<=18	<=23	<=29	>29
Number of public and private bodies to contact to register a public limited company (pre-registration+registration)	1/4	<=1	<=3	<=5	<=7	<=9	<=11	>11
Number of working days required to complete all mandatory procedures for registering a public limited company (pre-registration+registration)	1/4	<=16	<=33	<=49	<=66	<=82	<=98	>98
Total cost (US\$) of registering a public limited company (pre-registration+registration)	1/4	<=550	<=1150	<=1700	<=2800	<=5600	<=8500	>8500
Country scores (0-6)		$\sum_k c_k \text{ answer}_k$						

Note: Total cost of registering a public limited company are adjusted for PPP's.

Missing data: If no more than 1 element is missing the indicator is calculated as a simple average of the available data.

Table 9. **Integrated PMR indicator, low-level indicator: Administrative burdens for sole proprietor firms**

	Weight (c_k)	Coding of answers						
		0	1	2	3	4	5	6
Number of mandatory procedures required to register a sole proprietor firms (pre-registration+registration)	1/4	<=1	<=3	<=4	<=7	<=10	<=13	>13
Number of public and private bodies to contact to register a sole proprietor firms (pre-registration+registration)	1/4	<=1	<=3	<=5	<=8	<=10	<=12	>12
Number of working days required to complete all mandatory procedures for registering sole proprietor firms (pre-registration+registration)	1/4	<=7	<=14	<=29	<=43	<=58	<=72	>72
Total cost (US\$) of registering a sole proprietor firms (pre-registration+registration)	1/4	0	<110	<350	<550	<850	<=1150	>1150
Country score (0-6)		$\sum_k c_k \text{ answer}_k$						

Note: Total cost of registering a sole proprietor firm are adjusted for PPP's.

Missing data: If no more than 1 element is missing the indicator is calculated as a simple average of the available data.

Table 10. Integrated PMR indicator, low-level indicator: Sector-specific administrative burdens

	Industry weight (b_i) $1/2 \cdot W_i^{(1)}$	Question weight (c_k)	Coding of answers								
			Yes	No	No	No	No				
Road freight											
In order to establish a national road freight business, operators need to obtain a license (other than a driving license) or permit from the government or a regulatory agency			Yes	No	No	No	No				
In order to establish a national road freight business, operators need to notify any level of government or a regulatory agency and wait for approval before they can start operation		1/3	No	Yes	No	No	No				
Registration in transport register is required in order to establish a new business in the road freight sector			No	No	Yes	No	No				
In order to operate a national road freight business, operators need to notify any level of government or a regulatory agency			No	No	No	Yes	No				
			4	3	2	1	0				
			Yes		No						
There are criteria other than technical and financial fitness and compliance with public safety requirements considered in decisions on entry of new operators		1/3		1		0					
These entry regulations apply also if a firm wants to transport only for its own account		1/3		1		0					
			Always required	Depends on type of good sold or size of outlets		No					
Retail distribution	$1/2 \cdot W_i^{(1)}$										
Registration in commercial register is needed to start up a commercial activity for selling <u>food</u> products		1/8	6		3		0				
Registration in commercial register is needed to start up a commercial activity for selling <u>clothing</u> products		1/8	6		3		0				
Notification to authorities is needed to start up a commercial activity for selling <u>food</u> products		1/8	6		3		0				
Notification to authorities is needed to start up a commercial activity for selling <u>clothing</u> products		1/8	6		3		0				
Licenses or permits are needed to engage in commercial activity (not related to outlet sitting) for selling <u>food</u> products		1/8	6		3		0				
Licenses or permits are needed to engage in commercial activity (not related to outlet sitting) for selling <u>clothing</u> products		1/8	6		3		0				
Licenses or permits are needed for outlet sitting (in addition to compliance with general urban planning provisions) for selling <u>food</u> products		1/8	6		3		0				
Licenses or permits are needed for outlet sitting (in addition to compliance with general urban planning provisions) for selling <u>clothing</u> products		1/8	6		3		0				
Country scores (0-6)			$\sum_i b_i \sum_k c_k \text{ answer}_{ik}$								
<i>Note:</i> Normalized value of the indicator of general administrative burdens on startups $W_i = w_i / \text{Max } w_{98}$											
Missing data point:											
- for the retail distribution sub-element, a simple average of the available data points is used,											
- if only one of the two sub-element (road freight, retail distribution) is available the overall indicator is still computed with the only available sub-element											

Table 11. Integrated PMR indicator, low-level indicator: Legal barriers to entry

National, state or provincial laws or other regulations restrict the number of competitors allowed to operate a business in at least some markets in:			Coding of answers	
ISIC (rev. 3.1) code	Sector	Weight (a _i)	Yes	No
16	Manufacture of tobacco products	1	6	0
232	Manufacture of refined petroleum products	1	6	0
27	Manufacture of basic metals	1	6	0
28, 29	Manufacture of fabricated metal products, machinery and equipment	1	6	0
4010	Electricity: electricity generation/import or electricity supply	1	6	0
4020	Gas: gas production/import or gas supply	1	6	0
4100	Collection, purification and distribution of water	1	6	0
50, 51	Wholesale trade, incl. motor vehicles	1	6	0
55	Restaurant and hotels	1	6	0
601, 6303	Railways: Passenger transport via railways, Freight transport via railways, Operation of railroad infrastructure	1	6	0
6021	Other urban, suburban and interurban passenger transport	1	6	0
6023	Freight transport by road	1	6	0
6303	Operation of road infrastructure	1	6	0
61	Water transport	1	6	0
6303	Operation of water transport infrastructure	1	6	0
62	Air transport	1	6	0
6303	Operation of air transport infrastructure	1	6	0
642	Telecommunication: fixed-line network, fixed-line services, mobile services, internet services	1	6	0
6519, 659, 671	Financial institutions	1	6	0
66, 672	Insurance	1	6	0
74	Other business activity	1	6	0
851	Human health activities	1	6	0
9211, 9212	Motion picture distribution and projection	1	6	0
Country scores (0-6)			$(\sum_i a_i \text{ answer}_i) / \sum_i a_i$	

Note: The indicator is calculated if at least 20 data points are available.

Network industries:

Electricity: a YES is recorded if legal barriers restrict entry in any of the following sectors: electricity generation, electricity import, electricity supply.

Gas: a YES is recorded if legal barriers restrict entry in any of the following sectors: gas production, gas import, gas supply

Railways: a YES is recorded if legal barriers restrict entry in any of the following sectors: passenger transport via railways, freight transport via railways, operation of railroad infrastructure

Telecommunication: a YES is recorded if legal barriers restrict entry in any of the following sectors: fixed line services, mobile services, internet services.

Table 12. **Integrated PMR indicator, low-level indicator:
Antitrust exemptions for public enterprises or state-mandated actions**

	Question weight (c_k)	Coding of answers	
		Yes	No
Is there rule or principle providing for exclusion or exemption from liability under the general competition law for conduct that is required or authorized by other government authority (in addition to exclusions that might apply to complete sectors)?	$\frac{1}{4} * W_i$	6	0
Publicly-controlled firms or undertakings are subject to an exclusion or exemption from competition law such as horizontal cartels	$\frac{1}{4} * W_i$	6	0
Publicly-controlled firms or undertakings are subject to an exclusion or exemption from competition law such as vertical restraints or to abuse of dominance	$\frac{1}{4} * W_i$	6	0
Publicly-controlled firms or undertakings are subject to an exclusion or exemption from competition law such as mergers	$\frac{1}{4} * W_i$	6	0
Country scores (0-6)	$W_i * \sum_k c_k \text{ answer}_k / W_{98}^{\max}$		

Note: W_i = Scope of public enterprise sector
Missing data point: in case of missing data points, a simple average of the available data points is used.

Table 13. Integrated PMR indicator, low-level indicator: Barriers in network sectors

	<i>Theme weight (a_i)</i>	<i>Question weight (c_k)</i>	Coding of answers					
Entry regulation in network sector ¹	1/2							
Gas industry								
How are the terms and conditions of third party access (TPA) to the gas transmission grid determined?		1/3	Regulated TPA 0	Negotiated TPA 3		No TPA 6		
What percentage of the retail market is open to consumer choice?		1/3	(1-% of market open to choice/100)*6					
Is entry restricted in the gas production/import sector ?		1/3	No, free entry in all markets 0	Yes, in some markets 3		Yes, in all markets 6		
Electricity industry								
How are the terms and conditions of third party access (TPA) to the electricity transmission grid determined?		1/3	Regulated TPA 0	Negotiated TPA 3		No TPA 6		
Is there a liberalised w holesale market f or electricity (a w holesale pool)?		1/3	yes 0			no 6		
What is the minimum consumption threshold that consumers must exceed in order to be able to choose their electricity supplier (GWh/year) ?		1/3	No 0	<250 1	Between 250 and 500 2	Between 500 and 1000 3	More than 1000 4	No choice 6
Rail transport								
What are the legal conditions of entry into the passenger transport rail market?		1/2	Free entry (upon paying access fees) 0	Entry franchised to several firms 3		Entry franchised to a single firm or regulated according to EU 1991 directive 6		
What are the legal conditions of entry into the freight transport rail market?		1/2	0	3		6		
Air transport ²								
Does your country have an open skies agreement with the United States?		1/2*W	Yes 0			No 6		
Is your country participating in a regional agreement?		1/2*W	0			6		
Is the domestic aviation market in your country fully liberalised? That is, there are no restrictions on the number of (domestic) airlines that are allowed to operate on domestic routes?		(1-W)	0			6		
Road freight								
Does the regulator, through licenses or otherwise, have any power to limit industry capacity?		2/5	Yes 6			No 0		
Are professional bodies or representatives of trade and commercial interests involved in specifying or enforcing entry regulations?		3/5	6			0		

Table 13 cont'd. **Integrated PMR indicator, low-level indicator: Barriers in network sectors**

Postal services		No, free entry in all markets	Yes, in some markets	Yes, in all markets	
Is entry restricted in the national post - basic letter services sector ?	1/3	0	3	6	
Is entry restricted in the national post - basic parcel services sector ?	1/3	0	3	6	
Is entry restricted in the courier activities (other than national post) sector ?	1/3	no 0		yes 6	
Telecommunications ³		Free entry	Franchised to 2 or more firms	Franchised to 1 firm	
What are the legal conditions of entry into the trunk telephony market?	$1/4 * w^i * (1 - w^m)$	0	3	6	
What are the legal conditions of entry into the international market?	$1/4 * (1 - w^i) * (1 - w^m)$	0	3	6	
What are the legal conditions of entry into the mobile market?	$1/2 * w^m$	0	3	6	
Vertical integration in infrastructure sector ⁴	1/2				
Gas industry		Ownership separation	Legal/Accounting separation	Integrated	
What is the degree of vertical separation between gas production/import and the other segments of the industry?	1/2	0	3	6	
What is the degree of vertical separation between gas supply and the other segments of the industry?	3/10	0	3	6	
Is gas distribution vertically separate from gas transmission?	1/5	0		6	
Electricity industry		Separate Companies	Accounting separation	Integrated	
What is the degree of vertical separation between the transmission and generation segments of the electricity industry?	1/2	0	3	6	
What is the overall degree of vertical integration in the electricity industry?	1/2	Unbundled 0	Mixed 3	Integrated 6	
Rail transport		Ownership	Legal	Accounting	No
What is the degree of separation between the operation of infrastructure and the provision of railway services (the actual transport of passengers or freight)?	1	0	3	4.5	6
Country scores (0-6)		$\sum_i a_i \sum_j b_j \sum_k c_k \text{ answer}_{ijk}$			

Note:

1. The overall indicator is a simple average of the available sectoral sub-elements.
2. The weight W is the average share of international traffic in total traffic (measured in '000 rpk's) in the OECD.
3. The weight w^m is the 1998, 2003 OECD-wide revenue share from mobile telephony in total revenue from trunk, international, and mobile telephony. The weight w^i is the 1998/2003 OECD-wide revenue share of trunk in total revenue from trunk and international telephony.
4. The overall indicator is a simple average of the available sectoral sub-elements.

Table 14. Integrated PMR indicator, low-level indicator: Barriers in services

	<i>Weight by sector (a_i)</i>	<i>Weight by theme (b_j)</i>	<i>Question weight (c_k)</i>	Coding of answers						
Professional services	1/2									
Licensing:		1/2								
How many services does the profession have an exclusive or shared exclusive right to provide?			1	0	1	2	3	>3		
				0	1.5	3	4.5	6		
Education requirements (only applies if Licensing not 0):		1/2								
What is the duration of special education/university/or other higher degree?			1/3	equals number of years of education (max of 6)						
What is the duration of compulsory practise necessary to become a full member of the profession?			1/3	equals number of years of compulsory practise (max of 6)						
Are there professional exams that must be passed to become a full member of the profession?			1/3	no				yes		
				0				6		
Retail trade	1/2									
Licences or permits needed to engage in commercial activity		1/3								
If licences or permits are required for selling food (type 2) are they product specific?			1/2	no or not required				yes		
				0				6		
If licences or permits are required for selling food (type 2) do they relate to a certain type of activity?			1/2	0				6		
Specific regulation of large outlet		1/3								
What is the threshold surface limit at which regulation of large outlets applies?			1	No specific regulation for large outlets	between > 5000m ²	between 3000m ² and 5000m ²	between 2000m ² and 3000m ²	between 1000m ² and 2000m ²	between 500m ² and 1000m ²	less than 500m ²
				0	1	2	3	4	5	6
Protection of existing firms		1/3								
Are professional bodies or representatives of trade and commercial interests involved in Type 2, Type 3 or Type 4 licensing decisions?			1/2	no				yes		
				0				6		
Are there products that can only be sold in outlets operating under a local or national legal monopoly (franchise)?			1/2	0				6		
				0				6		
Country scores (0-6)	$\sum_i a_i \sum_j b_j \sum_k c_k \text{answer}_{ijk}$									

Note: The overall indicator is a simple average of the available sub-elements (professional services, retail trade)

- Type 1: Registration in commercial register or notification to authorities.
- Type 2: Licences or permits needed to engage in commercial activity.
- Type 3: Licences or permits needed for outlet siting.
- Type 4: Compliance with regulation especially designed for large outlets.

A3.3. *Barriers to Trade and Investment*Table 15. **Integrated PMR indicator, low-level indicator: Barriers to FDI**

	Weights by theme (b _j)	Question Weights (c _k)	Coding of answers	
			Yes	No
General barriers	1/2			
There are statutory or other legal limits to the number or proportion of shares that can be acquired by foreign investors in publicly-controlled firms		2/3*w _i	6	0
Special government rights can be exercised in the case of acquisition of equity by foreign investors		1/3	6	0
Sector-specific barriers	1/2			
FDI indicator values¹ * 6				
Country scores (0-6)	$\sum_j b_j \sum_k c_k \text{ answer}_{jk}$			

Notes: w_i: % of business sectors in which the state controls at least one firm.

1. Values of FDI restrictiveness index (Golub (2003) and Koyama and Golub (2006)), except for Luxembourg for which the old methodology is used. The sectors covered: manufacturing, construction, electricity, distribution, air, maritime and road transport fixed and mobile telecoms, insurance and banking, hotels and restaurant and business services (legal, accounting, architecture and engineering).

Table 16. **Integrated PMR indicator, low-level indicator: Tariff trade barriers**

Average production-weighted tariff	Coding of answers						
	<=3%	<=6%	<=9%	<=12%	<=15%	<=18%	>18%
Country scores (0-6)	0	1	2	3	4	5	6

Notes: New average tariffs computed from the 6-digit level of the Harmonised System (HS) product classification, with tariffs being defined as the ad valorem tariff rates applied to the most favoured nation. Tariff data have been aggregated into indicators for 2-digit ISIC Rev. 3 industries using import-based weights, i.e., sum of all imports of OECD countries (Nicoletti and Scarpetta, 2003).

Table 17. Integrated PMR indicator, low-level indicator: Discriminatory procedures

	Weights by theme (b _j)	Question weights (c _k)	Coding of answers																
			Yes																No
General discrimination																			2/3
Country has any specific provisions which require or encourage explicit recognition of the national treatment principle when applying regulations, so as to guarantee non-discrimination between foreign and domestic firms, goods or services		1/2	0																6
When appeal procedures relating to regulatory decisions are available in domestic regulatory systems, they are open to affected or interested foreign parties as well		1/3	0																6
There are specific provisions which require that regulations, prior to entry into force, be published or otherwise communicated to the public in a manner accessible at the international level		1/6	0																6
Competition discrimination																			1/3
0-6 Scale for competition discrimination																			
When business practices are perceived to restrict competition foreign firms can have redress through competition agencies	Yes	Yes	Yes	Yes	Yes	No	Yes	Yes	Yes	No	Yes	No	No	No	No	No	No		
When business practices are perceived to restrict competition foreign firms can have redress through trade policy bodies	Yes	Yes	No	No	Yes	Yes	No	Yes	No	Yes	No	No	Yes	No	Yes	No			
When business practices are perceived to restrict competition and hence prevent effective access of foreign firms (foreign owned or controlled) to such markets, foreign firms can have redress through regulatory authorities involved	Yes	No	Yes	No	Yes	Yes	Yes	No	Yes	No	No	No	No	Yes	Yes	No			
When business practices are perceived to restrict competition foreign firms can have redress through private rights of action	Yes	Yes	Yes	Yes	No	Yes	No	No	Yes	Yes	No	Yes	No	No	No	No			
			0	0.75	0.75	1.5	2.625	2.625	3.375	3.375	3.375	3.375	4.125	4.125	5.25	5.25	5.25	6	
Country scores (0-6)																			
$\sum_j b_j \sum_k c_k \text{ answer}_{jk}$																			

Table 18. **Integrated PMR indicator, low-level indicator: Regulatory barriers**

	Question weights (c _k)	Coding of answers	
		Yes	No
The country has engaged in Mutual Recognition Agreements (MRAs) in at least a sector with any other country	2/5	0	6
There are specific provisions which require or encourage regulators to consider recognizing the equivalence of regulatory measures or the result of conformity assessment performed in other countries, wherever possible and appropriate	4/15	0	6
There are specific provisions which require or encourage regulators to use internationally harmonized standards and certification procedures wherever possible and appropriate	2/9	0	6
There are any specific provisions which require or encourage regulatory administrative procedures to avoid unnecessary trade restrictiveness	1/9	0	6
Country scores (0-6)		$\sum_k c_k \text{ answer}_{jk}$	

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