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FINANCIAL RE-REGULATION SINCE THE GLOBAL CRISIS? AN INDEX-BASED ASSESSMENT

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By Oliver Denk and Gabriel Gomes

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ABSTRACT/RÉSUMÉ

Financial re-regulation since the global crisis? An index-based assessment

Domestic and international capital markets had been liberalised for decades until the mid-2000s. Then the global financial crisis struck. How has policy responded since the crisis: with re-regulation or continued liberalisation? This paper assembles a new dataset on financial policy from 2006 to 2015, by extending the International Monetary Fund's index compiled by Abiad, Detragiache and Tressel (2010), the most widely used measure of financial reforms in cross-country empirical research. The data show that ownership and supervision are the two areas of financial policy which have changed most visibly. Bank recapitalisations have increased government ownership of banks, and reforms have strengthened prudential regulation and bank supervision. Finance continues to be substantially less liberalised in emerging market economies than in advanced countries. The new dataset is available for use by other empirical researchers.

JEL classification: G18; G28; N20.

Keywords: Financial liberalisation, bank supervision, financial regulation.

Retour à la régulation depuis la crise financière ? Une évaluation basée sur indice

Les marchés de capitaux au niveau domestique et international ont été libéralisés pendant des décennies jusqu'à la première moitié des années 2000. Puis la crise financière est survenue. Au niveau des politiques économiques, quelles ont-été les réponses apportées depuis la crise : un retour à la régulation ou une continuité des politiques libérales ? Cet article rassemble une nouvelle base de données sur des politiques financières de 2006 à 2015, en prolongeant l'indice du Fonds Monétaire International compilé par Abiad, Detragiache et Tressel (2010), qui est le plus utilisé dans des travaux de recherche empirique évaluant les réformes financières dans plusieurs pays. Les données révèlent que la propriété des banques et la supervision bancaire ont été les deux domaines des politiques financières qui ont le plus changé. Le nombre de banques appartenant aux gouvernements a augmenté à la suite des recapitalisations et des réformes ont amélioré la régulation prudentielle et la supervision bancaire. La finance continue à être considérablement moins libéralisée dans les pays émergents par rapport aux économies avancées. Cette nouvelle base de données est disponible pour d'autres chercheurs empiriques.

Classification JEL : G18 ; G28 ; N20.

Mots-clés : Libéralisation financière, supervision bancaire, régulation financière.

TABLE OF CONTENTS

1. Introduction and main findings	6
2. The financial reform index.....	8
2.1. Dimensions of the financial reform index	8
2.2. Extending the ADT index.....	9
3. Developments in financial policy since 2005	12
3.1. Changes in credit controls	12
3.2. Changes in interest rate controls	13
3.3. Changes in banking sector entry barriers	13
3.4. Changes in capital account controls	14
3.5. Changes in privatisation	14
3.6. Changes in securities markets	15
3.7. Changes in prudential regulation and bank supervision.....	16
3.8. Changes in the aggregate financial reform index	18
4. Re-regulation or continued liberalisation since the crisis?	19
5. Conclusion	21
APPENDIX A1. SCORING METHODOLOGY AND NOTES ON THE EXTENSION.....	23
APPENDIX A2. FINANCIAL LIBERALISATION IN 2015 IN OECD AND G20 COUNTRIES	28
REFERENCES	50

Tables

1. List of countries in the dataset.....	8
2. Sources used to extend the index.....	11
3. Changes in financial liberalisation since the global crisis	20
4. Changes in financial liberalisation since the global crisis by country groups	21
A1.1. Coding rule for interest rate liberalisation.....	24

Figures

1. Credit liberalisation	12
2. Interest rate liberalisation	13
3. Ease of banking sector entry.....	14
4. Liberalisation of capital account controls.....	15
5. Privatisation.....	15
6. Deregulation of securities markets	16
7. Prudential regulation and bank supervision.....	17
8. Aggregate financial liberalisation index.....	18
9. Aggregate financial liberalisation index by country groups.....	19
10. Financial liberalisation across OECD and G20 countries	22
A2.1. Argentina	28
A2.2. Australia	28
A2.3. Austria	29
A2.4. Belgium	29
A2.5. Brazil	30
A2.6. Canada.....	30
A2.7. Chile	31

A2.8.	China	31
A2.9.	Czech Republic.....	32
A2.10.	Denmark	32
A2.11.	Estonia.....	33
A2.12.	Finland.....	33
A2.13.	France	34
A2.14.	Germany	34
A2.15.	Greece.....	35
A2.16.	Hungary.....	35
A2.17.	Iceland	36
A2.18.	India.....	36
A2.19.	Indonesia	37
A2.20.	Ireland.....	37
A2.21.	Israel	38
A2.22.	Italy.....	38
A2.23.	Japan.....	39
A2.24.	Korea	39
A2.25.	Latvia.....	40
A2.26.	Luxembourg	40
A2.27.	Mexico.....	41
A2.28.	Netherlands.....	41
A2.29.	New Zealand.....	42
A2.30.	Norway	42
A2.31.	Poland.....	43
A2.32.	Portugal	43
A2.33.	Russian Federation	44
A2.34.	Saudi Arabia	44
A2.35.	Slovak Republic	45
A2.36.	Slovenia.....	45
A2.37.	South Africa	46
A2.38.	Spain.....	46
A2.39.	Sweden	47
A2.40.	Switzerland.....	47
A2.41.	Turkey	48
A2.42.	United Kingdom.....	48
A2.43.	United States.....	49

FINANCIAL RE-REGULATION SINCE THE GLOBAL CRISIS? AN INDEX-BASED ASSESSMENT

Oliver Denk and Gabriel Gomes¹

1. Introduction and main findings

1. In the aftermath of the global financial crisis, an international consensus emerged that financial institutions should be regulated more strongly to improve their resilience. The Basel III accord, developed by the Basel Committee on Banking Supervision (2010), has been one such response. Debates have often centred on the extent to which reforms have been effective in reducing excessive bank leverage (Admati, 2016; OECD, 2016a). Financial policy, however, goes much beyond bank supervision and includes aspects such as credit controls, ease of entry into the banking sector, capital account controls and state ownership of banks. The general picture of the thirty years leading up to the global crisis was one of liberalisation of domestic and international capital markets, accompanied with stronger bank supervision.

2. The many dimensions of financial policy (bank supervision, credit controls, ease of entry, capital account controls and others) are rarely assessed together. One decade since the onset of the crisis seems an opportune moment to take stock of the overall outcome of financial reforms. Have they led to re-regulation or continued liberalisation? To our knowledge, no indicator that would account for the multifaceted nature of financial policies is available to quantitatively track the degree, and direction, of financial reforms in the post-crisis period and compare them with the liberalisation episodes of the past.

3. The most widely used source for measuring financial reforms in cross-country empirical research is the database of the International Monetary Fund (IMF) compiled by Abiad, Detragiache and Tresselt (2010, henceforth ADT). It includes seven aspects of financial regulation which are aggregated in a single index. The database covers 91 countries from 1973 to 2005 and has been used in an astonishing number of papers.² Many of them have been published in peer-reviewed economics journals, including the *American Economic Journal: Macroeconomics* (Giuliano et al., 2013), *Journal of Economic Perspectives* (Philippon and Reshef, 2013) and *Journal of the European Economic Association* (Faria et al., 2007). Recent OECD work has relied on the ADT index as well (e.g. Ahrend and Schweltnus, 2012; Cournède and Denk, 2015; Caldera Sánchez and Röhn, 2016). However, no attempt has been made to extend the ADT series beyond 2005, so that studies relying on these data have 2005 as the last available year, regardless of the date of publication.

1. Oliver Denk: Directorate for Employment, Labour and Social Affairs, OECD. Gabriel Gomes: Economics Department, OECD. Contact: Oliver.Denk@oecd.org and Gabriel.Gomes@oecd.org. We are grateful to Boris Cournède, Peter Hoeller, Catherine L. Mann and Lukasz Rawdanowicz (from the OECD Economics Department), Etienne Lepers, Pierre Poret and Sebastian Schich (from the OECD Directorate for Financial and Enterprise Affairs) as well as other colleagues for useful comments and suggestions. Special thanks go to many country desk economists and country delegations to the OECD who provided valuable inputs to this work.

2. Based on IDEAS/RePEc, the largest bibliographic database in economics, 177 different journal articles and working papers have used the ADT index for their empirical analysis (authors' count as of 3 March 2017).

4. This paper extends the ADT index for OECD and G20 countries to 2015. It hence contributes to the literature mainly in two ways. First, the extension of the time series allows empirical studies for which financial policies serve as the variable of interest or control variable to use an additional ten years of data. Second, the paper provides an internationally comparable perspective of developments in financial policies for the years following the global financial crisis. The index data in this paper complement other finance-related indices of the OECD, such as the Foreign Direct Investment Regulatory Restrictiveness index and the financial services part of the Services Trade Restrictiveness index that evaluate in detail specific areas of financial liberalisation and are available for a fewer number of years.

5. The analysis comes with a number of caveats. In particular, like other policy indices, changes in the ADT index depict a simplified picture of the complexity of policy reforms. For instance, the relevance of some of the seven dimensions that enter the index or their equal weighting could be debated. However, no judgement is made on the construction of the index, which is the same as for the original ADT index. Furthermore, the index design is flexible: Each of the seven reform dimensions can be analysed separately or the aggregate index can be modified by attributing different weights to the dimensions. Researchers who may, for example, be concerned that ADT view stricter prudential regulation and bank supervision as liberalisation could work with the other six dimensions or even invert the sign of reform on this dimension.

6. The main findings of the paper are:

- Since the global financial crisis, financial policy in OECD countries has become less liberalised in certain areas and more liberalised in others. The two areas where financial policy has changed most visibly are bank privatisation and bank supervision. Bank recapitalisations by governments have lowered financial liberalisation. In contrast, prudential regulation and bank supervision have been strengthened, which by design raises the index of financial liberalisation.
- Only one in five OECD countries had some restrictions to international capital movements before the crisis, when these are assessed with the widely used Chinn-Ito index. The countries with the largest changes since 2007 are Chile, Iceland and Slovenia, which according to the index have tightened restrictions, and Australia, Korea and Turkey, which have lifted restrictions.
- Other areas of financial policy were largely liberalised already in the 1990s and have remained so since the crisis. These include credit controls, interest rate controls, banking sector entry barriers and the development of securities markets.
- The aggregate financial policy index indicates that financial liberalisation in OECD countries was effectively the same in 2015 and 2007. The thirty-year long trend towards financial liberalisation ended with the global crisis. This is partly because for several countries and areas of finance the scope for further liberalisation has been small, but it is also because on average no further action has been taken.
- The picture has been different for G20 countries outside the OECD, where financial liberalisation has continued after the global crisis. The main factors behind this liberalisation have been the reduction of entry barriers into the banking sector, the strengthening of bank supervision, the deregulation of securities markets and the removal of interest rate controls.
- Finance continues to be substantially less liberalised in G20 countries outside the OECD than in OECD countries. Seven of the eight non-OECD G20 countries are among the ten least liberalised economies in the sample.

7. The paper is organised as follows. The next section outlines the ADT index and the methodology used to extend it. Section 3 describes changes in the values of the index since 2005, and Section 4 analyses developments in financial policies before and after the financial crisis for advanced and emerging market economies. The last section concludes. Appendices A1 and A2 provide details on the construction of the index and individual country scores for the various dimensions of the index.

2. The financial reform index

2.1. Dimensions of the financial reform index

8. This paper extends the IMF's financial reform index of Abiad, Detragiache and Tressel (2010), or ADT, by an additional ten years from 2006 to 2015. ADT themselves built upon the earlier work of Abiad and Mody (2005). The country sample in this paper is about half of ADT's and covers all OECD and G20 countries, 43 in total (Table 1).³ As the original ADT index, the extension to 2015 in this paper takes into account seven dimensions of financial policy: credit controls; interest rate controls; banking sector entry barriers; capital account controls; state ownership of banks; regulation of securities markets; and prudential regulation and bank supervision.

Table 1. List of countries in the dataset

OECD				Non-OECD G20
Australia	Austria	Belgium	Canada	Argentina
Chile	Czech Republic	Denmark	Estonia	Brazil
Finland	France	Germany	Greece	China
Hungary	Iceland	Ireland	Israel	India
Italy	Japan	Korea	Latvia	Indonesia
Luxembourg	Mexico	Netherlands	New Zealand	Russian Federation
Norway	Poland	Portugal	Slovak Republic	Saudi Arabia
Slovenia	Spain	Sweden	Switzerland	South Africa
Turkey	United Kingdom	United States		

9. Aspects of financial policy that these seven dimensions cover are the following:

1. Credit controls:

This dimension measures the restrictiveness of bank reserve requirements and the existence of either mandatory amounts of credit lending or credit subsidies to specific sectors.

2. Interest rate controls:

This dimension characterises the extent to which regulations restrict banks in setting lending and deposit rates.

3. Banking sector entry barriers:

This dimension captures barriers to entry for foreign and domestic banks into the domestic banking system, restrictions on the geographic area where banks can operate and restrictions on the scope of bank activities.

3. In the original ADT dataset, four OECD countries (Iceland, Luxembourg, the Slovak Republic and Slovenia) and one non-OECD G20 country (Saudi Arabia) are missing. The current paper calculates the ADT index for these countries over the period 2000-15.

4. Capital account controls:
This dimension evaluates the degree of restrictions to international capital movements.
5. Privatisation:
This dimension assesses the extent to which the government directly participates in banking activities through the ownership of bank assets.
6. Regulation of securities markets:
This dimension scores countries by policies governments pursue to deregulate and encourage the development of bond, equity and derivative markets.
7. Prudential regulation and bank supervision:
This dimension examines the compliance of a country's capital adequacy rules with the Basel standard, the independence and scope of responsibility of the banking supervisory authority and the effectiveness of bank inspections.

10. The index goes from 0 (full regulation) to 1 (full liberalisation) for each of the seven dimensions and is based on a set of 20 questions, some of which are quantitative, others qualitative. For the seventh dimension, more prudential regulation and bank supervision is coded as a liberalisation reform, so that stronger supervision of the banking sector yields a higher score. The aggregate index is calculated as the simple average of the seven dimensions.⁴

2.2. Extending the ADT index

11. The main challenge for the extension of the ADT index is consistency between the original index and the extension. This is particularly difficult since ADT only provide the aggregate values for the seven dimensions, but not the scores for the 20 individual questions.⁵ Furthermore, for some questions the coding rule leaves room for interpretation, which may lead to "miscoding" and a "construction break" between the existing data and the extension.

12. These issues are addressed by re-constructing the index for the period 2000-05, for which the ADT series is already available, using the same data sources and methodology as for the period 2006-15. The newly obtained scores were then compared with those for the seven dimensions in the ADT dataset. No systematic discrepancies could be identified along any dimension. In the few cases where the value for a dimension did not match the one in ADT, the value in ADT was revised to ensure consistency with the extended data.⁶

4. In the original ADT dataset, each dimension ranges from 0 (full regulation) to 3 (full liberalisation) and the aggregate index, which is the sum of the seven dimensions, ranges from 0 to 21. To allow for a simple use of the data, this paper normalises these values so that each dimension and the aggregate score lie between 0 and 1.

5. Besides the fifth dimension (privatisation), which has one question, only the results of one of the questions for the first dimension (credit controls) are explicitly provided ("Are there any aggregate credit ceilings?"), although around 50% of the values are missing.

6. The paper changed the values of the original ADT index for the following dimensions, countries and years: credit controls in Argentina for 1995-2005, Austria for 1999-2005 and Poland for 2000-05; interest rate controls in China for 2004-05; banking sector entry barriers in Indonesia for 1998-2005; privatisation in Finland for 2001-05; and securities markets in India for 1999-2005. For Austria and Poland, the first dimension and therefore the aggregate index start later than in ADT, in 1999 for Austria and 2000 for Poland, as no consistent time series are available prior to 1999 for Austria and 2000 for Poland.

13. The extension of the index draws on a number of different sources of information (Table 2).⁷ For many questions multiple sources were used, and some sources were used for several questions. The sources were complemented with judgements by OECD country desk economists. They can be grouped in three main categories:

- Existing datasets: This category includes the reserve requirements data of Federico et al. (2014), the Foreign Direct Investment (FDI) Regulatory Restrictiveness index by the OECD (Kalinova et al., 2010), the Services Trade Restrictiveness (STR) index by the OECD (Rouzet et al., 2014) and the latest update of the Chinn-Ito index (Chinn and Ito, 2006, 2008).
- Surveys and reports: This category includes the Bank Regulation and Supervision Survey (BRSS) by the World Bank (Barth et al., 2008; Čihák et al., 2012), the Financial Sector Assessment Program (FSAP) and Annual Reports on Exchange Arrangements and Exchange Restrictions (AREAER) by the IMF, the Financial Stability Institute Surveys (FSIS) and the Regulatory Consistency Assessment Programme (RCAP) of the Bank for International Settlements, a study on interest rate restrictions in the European Union (iff/ZEW, 2010) and financial stability reports by central banks.
- Legal documents: This category includes central bank organic laws, bank acts, amendments and comparative law guides, such as the Global Legal Insights (GLI) Banking Regulation from 2016 and the LexMundi Global Practice Guide on Bank and Finance Regulation from 2012.

14. This paper follows the precise wording of the ADT methodology, with three exceptions. First, in the first dimension of the financial reform index (credit controls) a question on credit ceilings is removed. Only around 50% of observations have information on this question in the original dataset, so that the scoring system was not the same for all countries. Second, the entire time series for the fourth dimension (capital account controls) is replaced by the Chinn-Ito index (Chinn and Ito, 2006, 2008). This index is more granular than the original IMF data, and using the same series since 1973 avoids breaks.⁸ Like most questions in ADT, it is de jure-based. It measures the restrictions on capital account transactions and has been used in related OECD work (Caldera Sánchez and Gori, 2016). The Chinn-Ito index nevertheless has some downsides which need to be borne in mind, including that it does not reflect the full range of policies relevant for capital flows, in particular measures that discriminate by currency (de Crescenzo et al., 2015). As a consequence of these changes to the dimensions of credit and capital account controls, the extension relies on 17 questions, not 20 as the original ADT index. Finally, the word “latest” is added in Question 7.1 to account for new versions of the Basel accord. Appendix A1 lists the complete coding rule.

7. The information that could be found was incomplete for at least one question for the following dimensions, countries and years: credit controls in the Czech Republic, Hungary, India, Indonesia, Japan, Norway and Portugal for 2006-15, Poland for 2000-04 and Saudi Arabia for 2000-15; banking sector entry barriers in Brazil for 2006-15 and Indonesia for 2006-09; privatisation in the Czech Republic, Greece, Japan, Latvia, the Netherlands, Portugal, Spain, Switzerland and the United Kingdom for 2011-15 and Saudi Arabia for 2000-15; and prudential regulation and bank supervision in Brazil for 2013-15 and South Africa for 2006-15. In most of these cases, values from other years were used to extend the series to the years with incomplete information.

8. The Chinn-Ito index is closely correlated with the fourth dimension in ADT (available up to 2005) as well as alternative measures of capital account openness (Quinn, 1997; Schindler, 2009; Fernández et al., 2016). Several countries that in 2005 are attributed the maximum score with ADT (reflecting full openness) do not attain the maximum score with Chinn-Ito. These are: Australia, India, Israel, Korea, Mexico, Poland, the Russian Federation, South Africa and Turkey. The Chinn-Ito data go up to 2014, and the 2014 values were assumed to be unchanged in 2015. Furthermore, information in ADT was used to have Chinn-Ito start in the same year as the other dimensions in ADT for a small number of countries for which Chinn-Ito begins a few years after ADT.

Table 2. Sources used to extend the index

Dimensions	Sources
<p>1. Credit controls:</p> <p>1.1. Are reserve requirements restrictive?</p> <p>1.2. Are there minimum amounts of credit that must be channelled to certain sectors?</p> <p>1.3. Are there mandatory requirements on credit allocation at subsidised rates?</p>	<p>Federico et al. (2014), financial stability reports</p> <p>Legal documents</p>
<p>2. Interest rate controls:</p> <p>2.1. To what extent does the government control deposit rates?</p> <p>2.2. To what extent does the government control lending rates?</p>	<p>iff/ZEW (2010), bank acts, LexMundi, press releases</p>
<p>3. Banking sector entry barriers:</p> <p>3.1. To what extent are foreign banks allowed to enter the domestic market?</p> <p>3.2. Are new domestic banks allowed to enter the market?</p> <p>3.3. Are there restrictions on branching?</p> <p>3.4. Are banks allowed to become universal banks?</p>	<p>FDI index, STR index, BRSS, GLI, LexMundi</p>
<p>4. Capital account controls: What is the extent of openness in capital account transactions?</p>	<p>Chinn and Ito (2006, 2008)</p>
<p>5. Privatisation: What is the share of bank assets that are state-owned?</p>	<p>BRSS, financial stability reports</p>
<p>6. Securities markets:</p> <p>6.1. To what extent are securities markets developed?</p> <p>6.2. To what extent is the equity market open to foreign investors?</p>	<p>AREAER</p> <p>FDI index</p>
<p>7. Prudential regulation and bank supervision:</p> <p>7.1. Is the capital adequacy ratio based on the latest Basel standard?</p> <p>7.2. Is the banking supervisory agency independent from executives' influence?</p> <p>7.3. To what extent are on-site and off-site examinations effective?</p> <p>7.4. Does the supervisory agency cover all financial institutions?</p>	<p>FSIS, RCAP</p> <p>BRSS, FSAP, legal documents</p> <p>FSAP, FSIS, RCAP</p> <p>FSAP, LexMundi</p>

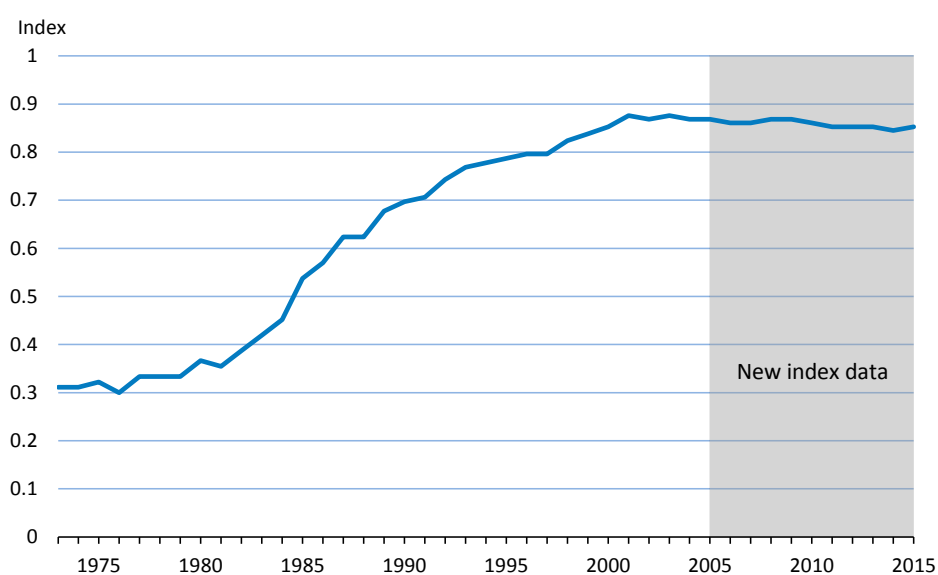
3. Developments in financial policy since 2005

15. This section discusses developments in financial regulation since 2005 along each of the seven dimensions and for the aggregate index of financial liberalisation, based on the extended data.⁹

3.1. Changes in credit controls

16. The average score for the removal of credit controls across OECD and G20 countries has not moved much since the early 2000s (Figure 1). The most common reason for not attaining full liberalisation on this dimension is that one quarter of OECD and G20 countries have sector-specific quotas or subsidies for bank credit to businesses.

Figure 1. Credit liberalisation



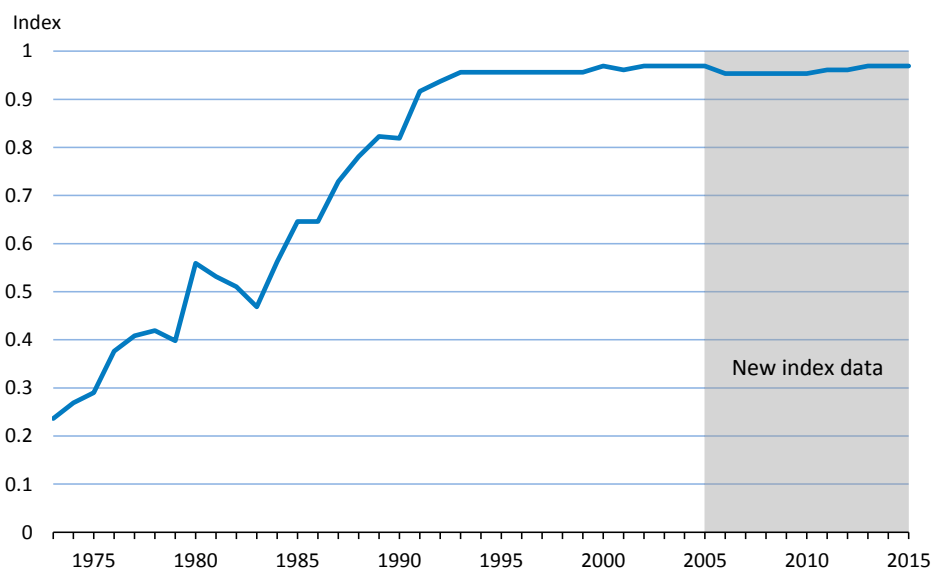
17. Since 2005, the score on this dimension has changed for several countries because of variations in reserve requirements. Reductions in reserve requirements tend to increase the amount of bank assets available for lending, while avoiding some of the currency depreciation and capital outflow risks that may come with lower interest rates, especially in emerging market economies. Argentina, for example, reduced reserve requirements for commercial banks from 23% to 17% in 2008, before increasing them again to 29% in 2014. China increased reserve requirements for large banks in several steps from 8% in 2006 to 20% in 2012 and slightly decreased them in 2015 (18%). Indonesia raised reserve requirements from 8% to 11% in 2011 and 12% in 2014, then reduced them to 4% in 2015. The Russian Federation increased reserve requirements from 7% to 10% in 2006, reduced them to 3% in 2007, but raised them again to 5% in 2011 in response to persistently high inflation expectations. Finally, Turkey increased reserve requirements from 8% to 11% in 2011 to reduce credit growth.

9. The average time series in this section are influenced by several countries entering the dataset after 1973. All curves are, however, very similar when the data are restricted to a constant set of countries or spliced when a new country enters the dataset. The last year a country enters the dataset is 2000, which is several years before the period of principal interest.

3.2. Changes in interest rate controls

18. Few countries in the sample have had controls on lending or deposit rates since the 1990s, so that this dimension has been close to the maximum value of 1 on average across the OECD and G20 (Figure 2).

Figure 2. Interest rate liberalisation



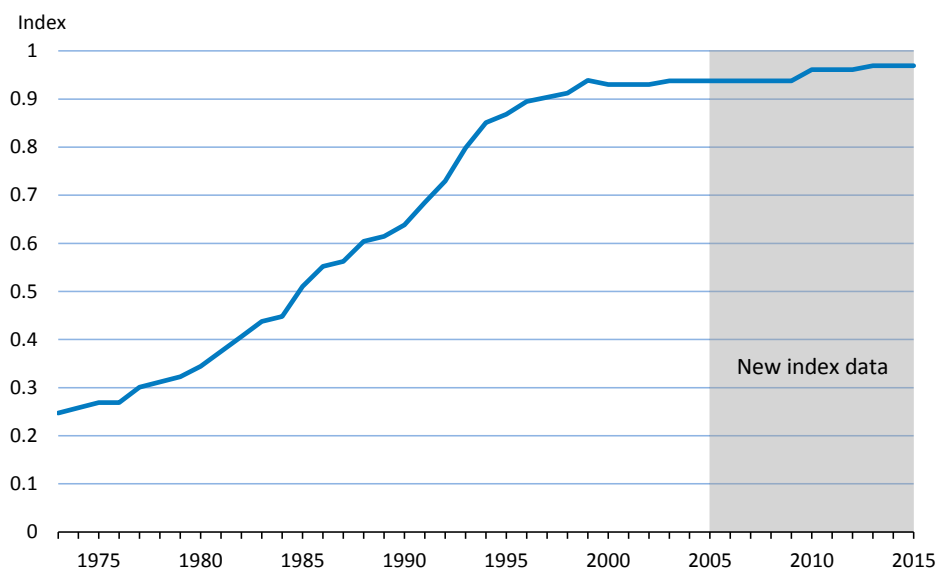
19. Wide-ranging controls on deposit rates were in place in 2005 only in China and India. India largely liberalised deposit rates in 2011, although interest rates on small savings schemes, such as the *Public Provident Fund*, continue to be regulated. China has taken steps towards liberalisation by increasing the ceiling on deposit rates three times since 2012, even if this did not improve the score for this dimension which is measured in a less granular way. Turkey is the only country to have moved the other way, with the Council of Ministers having the authority since 2006 to set interest rates on bank deposits, although this has been relevant so far only for judiciary cases.

20. Controls on lending rates were in place in 2005 in China and Korea. The Chinese government liberalised lending rates in 2013, although with several exceptions, including for mortgage credit. By contrast, Turkey has tightened controls on lending rates, even if this does not appear to have been of much practical importance to date. As of 2006, Turkey's Council of Ministers has had the authority to set interest rates on bank loans.

3.3. Changes in banking sector entry barriers

21. Governments have taken further steps to promote competition in the banking sector, so that the vast majority of OECD and G20 countries score a 1 on this dimension (Figure 3). Brazil, China and Saudi Arabia remain the only three countries in the sample that, according to the index, continue to have some banking sector entry barriers. The scores for India and Indonesia have risen to 1 during the past decade. Since 2006, they have loosened the entry regulations for foreign banks. India has also authorised the creation of universal banks, and Indonesia has allowed banks to engage in securities and insurance activities.

Figure 3. Ease of banking sector entry



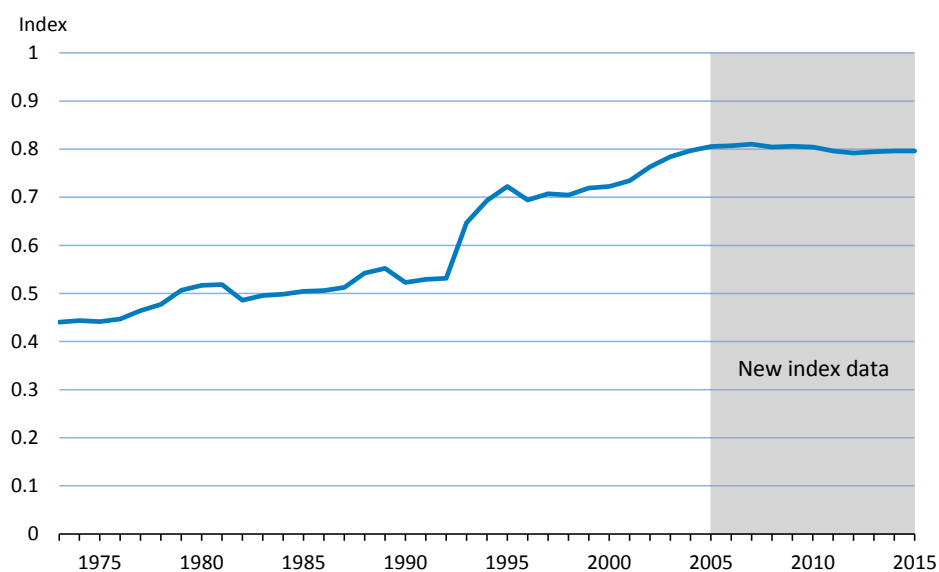
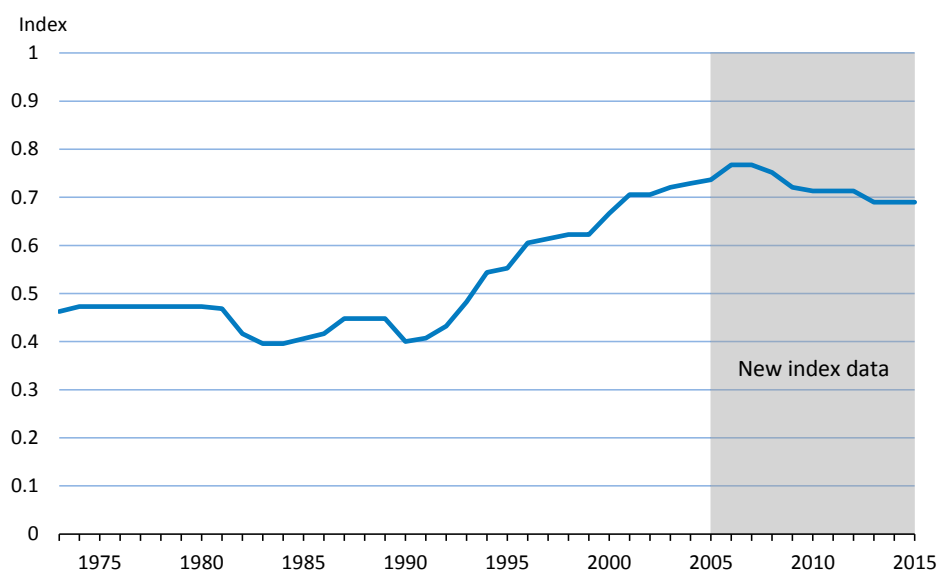
22. China has taken several steps to ease banking sector entry, even if these have been insufficient to improve the index score. Since 2006, it provides full national treatment of foreign-owned banks. Under the agreement with the World Trade Organisation, foreign banks, when incorporated locally, are permitted to engage in the same range of financial services as Chinese banks, including taking retail renminbi deposits. They are also regulated and supervised in the same way as domestic banks. In addition, in 2015, China eased restrictions on branch openings and renminbi transactions for foreign banks.

3.4. Changes in capital account controls

23. All OECD countries adhere to the *OECD Code of Liberalisation of Capital Movements*, which aims to progressively remove unnecessary barriers to the movement of capital, while providing countries with flexibility to cope with economic and financial instability (OECD, 2016b). Measured by the Chinn-Ito index, only one in four OECD countries, but all eight non-OECD G20 countries had some restrictions to international capital movements in 2005. No further progress has been achieved on average over the past decade, as the thirty-year long trend towards fewer capital controls ended in the mid-2000s (Figure 4). Nevertheless, the index has evolved for several countries. Argentina, which has gradually increased capital controls since 2005, is one of the countries with the largest change. Similarly, Chile, Iceland and Indonesia have raised their controls at various points over the past decade. By contrast, Korea, the Russian Federation and Turkey have in place substantially fewer controls on capital transactions than ten years ago.

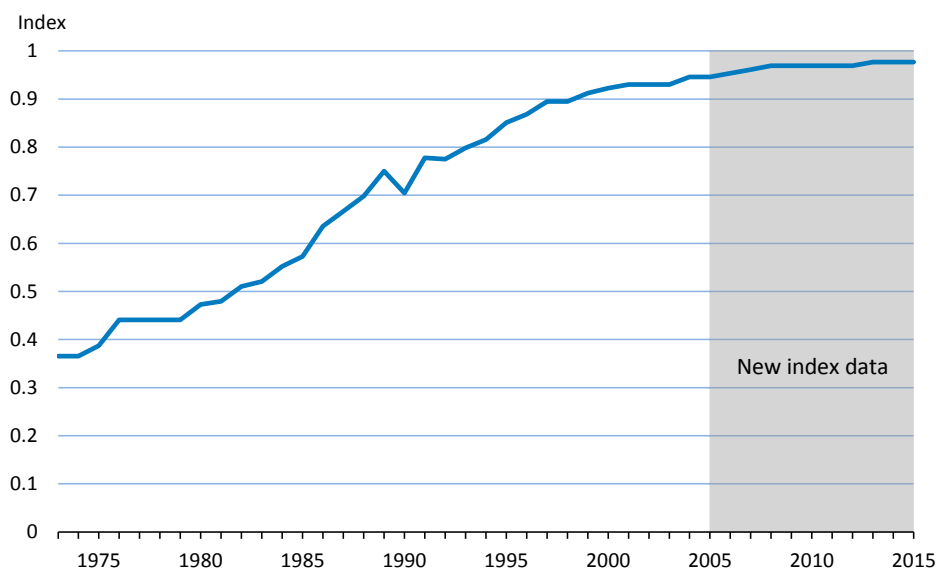
3.5. Changes in privatisation

24. Governments recapitalised several banks in the wake of the global financial crisis. In a number of countries, this contributed to lifting the government ownership share of banks from below 10% before the crisis to higher values during the crisis, triggering a decline in the score for privatisation (Figure 5). Examples of countries in which public ownership rose to between 10% and 25% are: Austria, Ireland, Latvia and the Netherlands. Iceland, Slovenia and the United Kingdom are three countries in which public ownership rose to above 25%. In some of these countries, government ownership of banks has receded in recent years as the financial crisis has ebbed.

Figure 4. Liberalisation of capital account controls**Figure 5. Privatisation**

3.6. Changes in securities markets

25. In most advanced countries, securities markets were deregulated in the 1980s and early 1990s. In many emerging market economies, the development of securities markets started in earnest in the 1990s. For the years covered by the extension of this paper, nearly all movements have gone in the direction of continued liberalisation of securities markets (Figure 6). The only countries that in 2015 did not attain the maximum score of 1 on this dimension are China, Iceland and Saudi Arabia.

Figure 6. Deregulation of securities markets

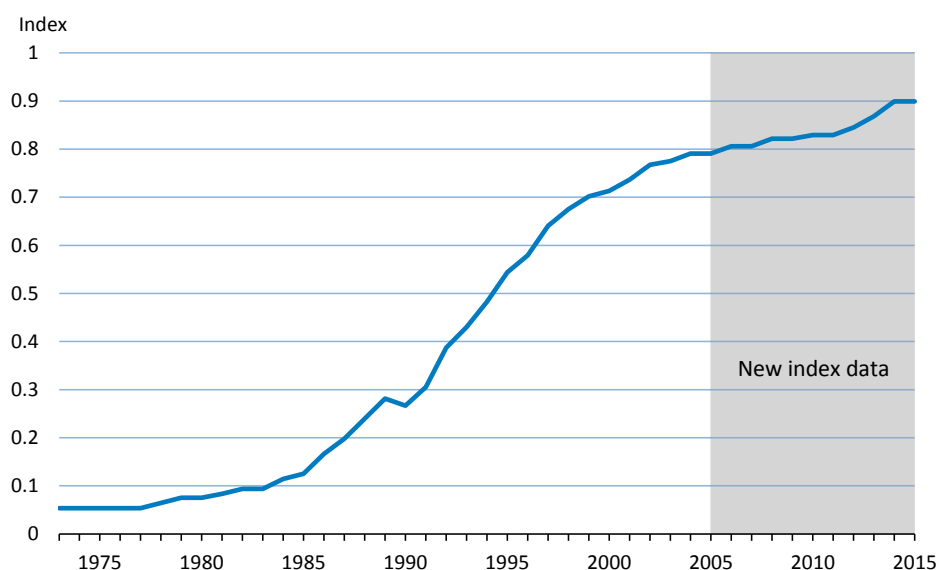
26. Several countries changed the regulation of securities markets before or at the onset of the global financial crisis. Iceland prohibited investing in financial instruments with foreign currency, including securities, investment funds and money market instruments. India, Indonesia, Saudi Arabia and South Africa, on the other hand, made steps towards liberalisation. The Central Bank of India removed restrictions for foreigners to purchase Indian derivatives. Indonesia liberalised the regulation of derivatives for exchange rates and interest rates. Saudi Arabia modified its regulations to allow foreign residents to invest in Saudi Arabian stock companies. South African companies, trusts, partnerships and banks became eligible to participate without restriction in the rand futures market and invest in foreign entity listings on the Johannesburg Stock Exchange, South Africa's largest stock exchange.

27. Brazil has been particularly active in changing securities markets legislation, with policy reforms taking place before, during and after the global crisis. In 2006, it lifted restrictions on transfers abroad and securities transactions abroad by resident entities. In 2009, it introduced a 2% tax on financial operations (IOF) which included inflows from abroad into equity and fixed income investments (but not foreign direct investment) and applied to both short- and long-term flows. In 2010, controls increased as the IOF rate was raised from 2% to 6% for foreign inflows in fixed income instruments. In 2013, regulation was softened with a reduction of the IOF rate to zero on foreign exchange derivative transactions.

3.7. Changes in prudential regulation and bank supervision

28. Since 2005, several countries have adopted measures to strengthen bank supervision (Figure 7). Many countries have now fully implemented Basel II standards and a banking supervisory authority that is independent and effective. For 2015, two-thirds of all countries in the sample receive the maximum score of 1 on this dimension. The most common issue for the remaining third of countries is the lack of de jure independence of the supervisory agency.

Figure 7. Prudential regulation and bank supervision



29. The majority of countries adopted Basel II by 2010, the first year for which the index takes Basel II as the relevant standard instead of Basel I. This influences the score for the first question of this dimension (“Is the capital adequacy ratio based on the latest Basel standard?”) as well as for the third question which concerns the effectiveness of on-site and off-site examinations. Pillar 2 of Basel II reinforces the way in which supervisory authorities collect, review and analyse prudential reports and statistical returns from banks through on-site examinations or external experts. As a result, the score related to the effectiveness of on-site and off-site examinations attains the maximum level in all countries that implemented this pillar.¹⁰ Basel II is taken to be the relevant standard until 2015, the last year of the dataset, as countries are still in the phase of adopting the final standard of Basel III capital requirements.

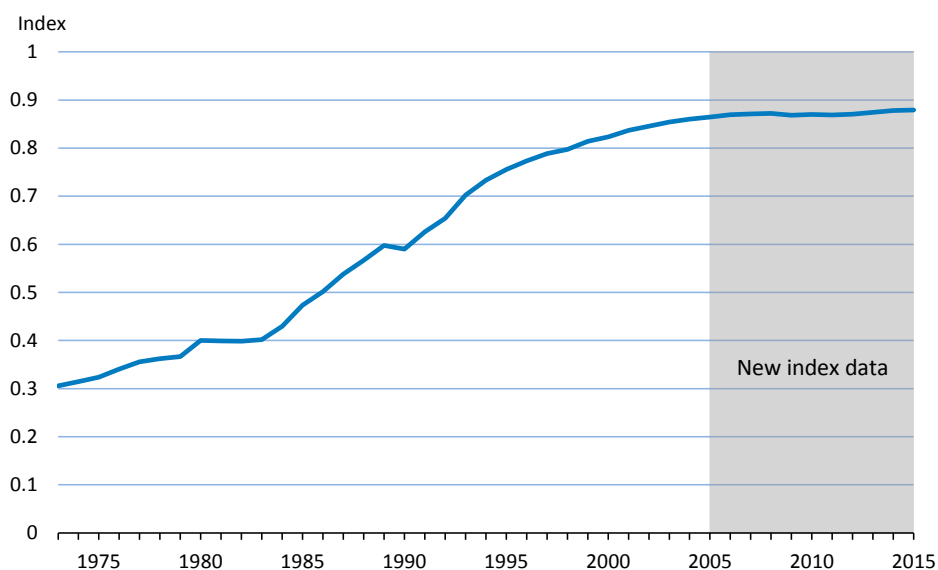
30. Several countries have reinforced the independence and power of the bank supervisory authority. In the Slovak Republic, this occurred in 2006 when the central bank took over the supervision of the financial sector. In 2008, Korea replaced the existing supervisory authority with the Financial Services Commission, which increased independence from political executive power. In a similar reform in 2008, Finland’s Act on the Financial Supervisory Authority also reduced the involvement of the government in financial supervision. In 2014, Indonesia’s supervisory authority *Otoritas Jasa Keuangan* fully took over the supervision of financial institutions from the Bank of Indonesia, which increased supervisory independence from political influence. In Europe, the European Central Bank (ECB) has the authority to supervise the banking sector in all euro area countries through the Single Supervisory Mechanism (SSM) since 2014. This involves cooperation between the ECB and the national supervisory authorities, with the ECB having the responsibility for the overall functioning of the SSM.

10. The score for the question on bank examinations thus increased in Argentina, Brazil, the Czech Republic, Finland, Greece, Iceland, India, Indonesia, Israel, Italy, Mexico, the Russian Federation, South Africa and Turkey.

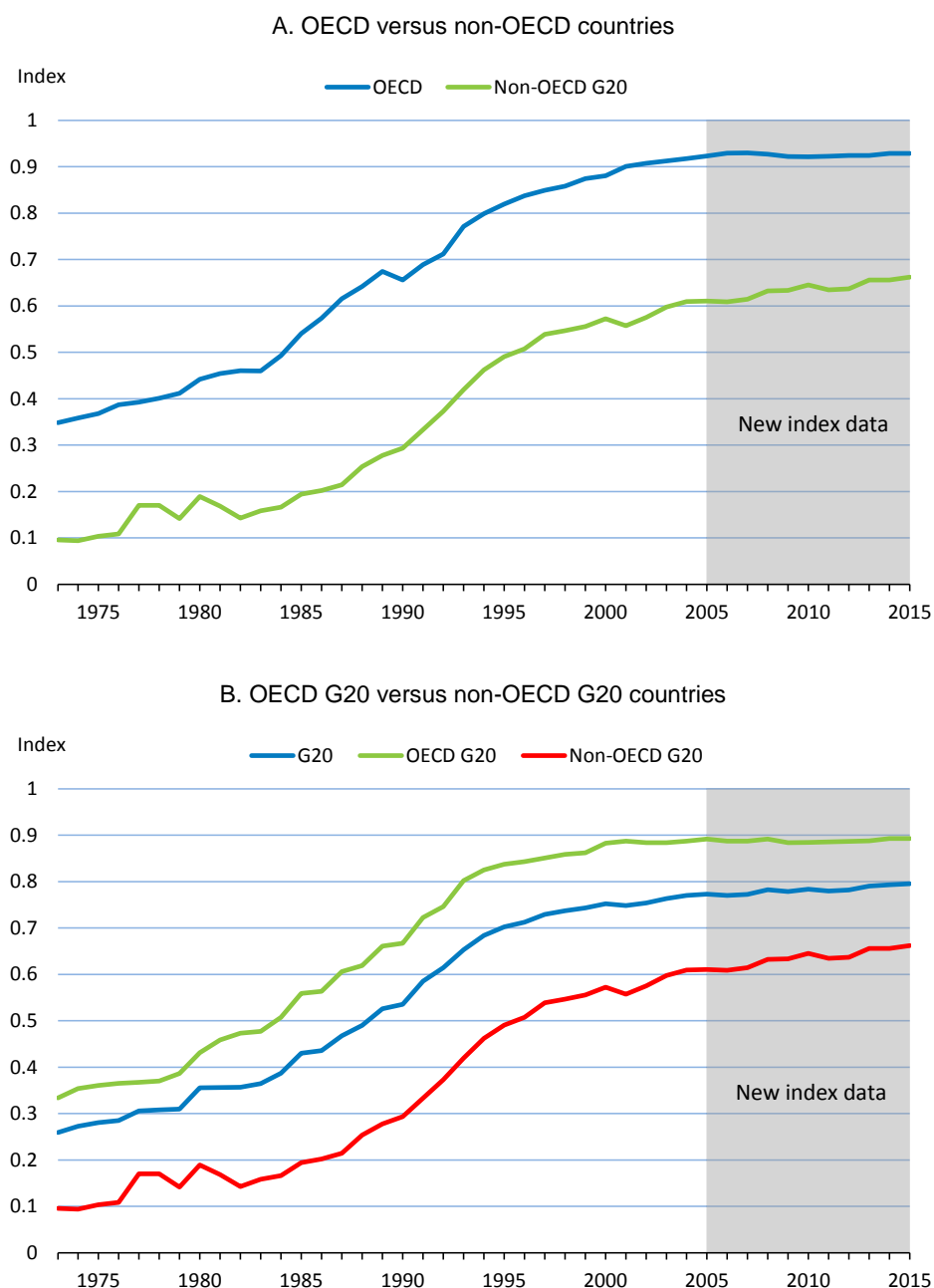
3.8. Changes in the aggregate financial reform index

31. The aggregate financial reform index takes the simple average of the policy changes along the seven dimensions. The 2015 cross-country average of the overall index was similar to the one for 2005 (Figure 8). This reflects changes in several dimensions, in particular privatisation and bank supervision that have offset each other. It also reflects that, according to ADT, many countries covered in this study had fully liberalised their financial sector along most dimensions already before 2005, which puts a lid on the scope for further upward movement. Most policy changes since 2005 have occurred in emerging market economies, motivating a differentiation between their developments and those in advanced economies.

Figure 8. Aggregate financial liberalisation index



32. Distinguishing between OECD and non-OECD countries, OECD countries tend to have a higher degree of liberalisation than non-OECD countries. Over the past decade, however, the score of non-OECD countries has risen, while that of OECD countries has remained unchanged (Figure 9, Panel A). A similar pattern emerges when OECD and non-OECD G20 countries are compared (Figure 9, Panel B). The next section, which focuses on changes in financial policy since the crisis, will shed light on the dimensions that lie beneath this small, but nevertheless visible convergence in financial liberalisation of non-OECD with OECD countries.

Figure 9. Aggregate financial liberalisation index by country groups

4. Re-regulation or continued liberalisation since the crisis?

33. The extension of the ADT index put forward in this paper can be used to compare developments in financial policy before and after the global financial crisis. For the OECD and G20 as a whole, the analysis in the previous section suggests that the crisis ended a sustained period of financial liberalisation. Government ownership of banks increased and bank supervision was strengthened, although stronger bank supervision raises the index by design. This section takes a more detailed look at developments in financial regulation before (2000-07) and after the crisis (2007-15), distinguishing between the seven dimensions of financial liberalisation and also between OECD, non-OECD, G20 and non-G20 countries.

34. A simple calculation of the average changes in the aggregate index for all countries suggests that after the crisis the pace of financial liberalisation has slowed (Table 3). On average, the index rose by 0.05 points in the period preceding the crisis and 0.01 points since the crisis. Among the seven dimensions, privatisation and liberalisation of capital account controls have contributed most strongly to the slowdown in reform. Bank ownership trends have gone in reverse, from greater privatisation before the crisis to substantial re-nationalisation since the crisis. The liberalisation of capital movements, notable before the crisis, has come to a standstill since the crisis. Prudential regulation and bank supervision, which enter the index as liberalisation, have been the main countervailing force, as they have kept their reform pace of 0.09 points.

Table 3. Changes in financial liberalisation since the global crisis

	Fewer credit controls	Fewer interest rate controls	Ease of banking sector entry	Fewer capital account controls	Privatisation	Securities markets	Bank supervision	Aggregate index
2000-07	0.01	-0.02	0.01	0.09	0.10	0.04	0.09	0.05
2007-15	-0.01	0.02	0.03	-0.01	-0.08	0.02	0.09	0.01

35. These conclusions stem primarily from developments in OECD countries, which make up four-fifths of the countries in the sample. Emerging market economies, defined here as the eight non-OECD G20 countries, show a distinctly different pattern (Table 4, Panel A). For them, financial liberalisation has continued since the crisis, with the aggregate index rising by 0.04 points between 2000 and 2007 and by 0.05 between 2007 and 2015. Particular strong contributions to the increase of the aggregate index in the post-crisis period have come from the easing of banking sector entry, prudential regulation and bank supervision, the development of securities markets and interest rate liberalisation. As in OECD countries, government ownership of banks has risen in emerging market economies. A similar picture emerges when G20 countries are divided in OECD G20 and non-OECD G20 countries, except that the weight of emerging market economies is larger in the G20 than the OECD (Table 4, Panel B).

36. Despite the stronger deregulation in emerging market economies since the global crisis, finance continues to be substantially more liberalised in OECD than G20 countries outside the OECD (Figure 10). Seven of the eight non-OECD G20 countries were among the ten least liberalised economies in 2015. The three OECD countries in the “bottom 10” are Iceland, Japan and Turkey. The index reaches its maximum value of 1 in Austria, Belgium, Canada, Denmark, Estonia, Finland, France, Israel, Italy, Luxembourg, New Zealand, Spain and the United States. Since 2007, the largest deregulations have taken place in India and Indonesia, the largest re-regulations in Iceland and Slovenia. Appendix A2 shows the 2015 score for each of the seven dimensions as well as the aggregate score separately for the 43 countries in the sample.

Table 4. Changes in financial liberalisation since the global crisis by country groups

A. OECD and non-OECD countries

	Fewer credit controls	Fewer interest rate controls	Ease of banking sector entry	Fewer capital account controls	Privatisation	Securities markets	Bank supervision	Aggregate index
OECD								
2000-07	0.03	-0.03	0.01	0.11	0.11	0.01	0.09	0.05
2007-15	-0.01	0.00	0.00	-0.01	-0.08	0.00	0.09	0.00
Non-OECD								
2000-07	-0.08	0.04	0.00	0.00	0.04	0.17	0.13	0.04
2007-15	0.00	0.08	0.17	-0.04	-0.08	0.08	0.13	0.05

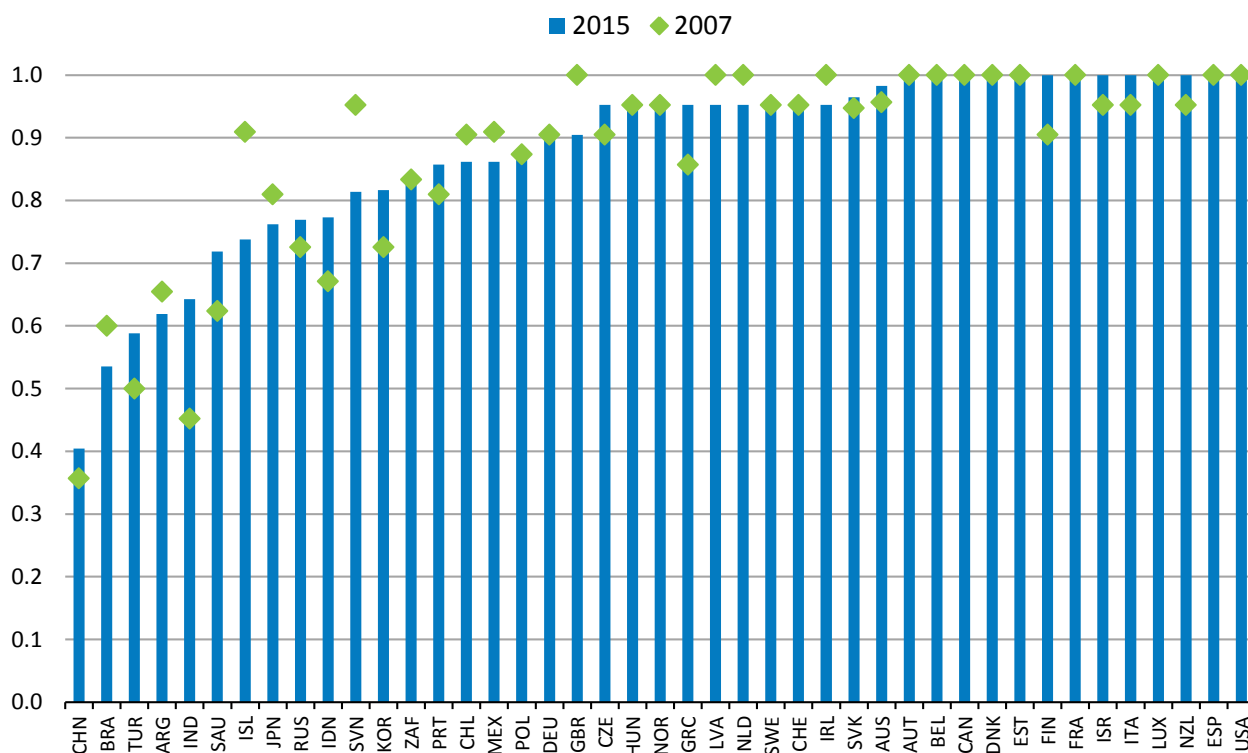
B. G20 and OECD G20 countries

	Fewer credit controls	Fewer interest rate controls	Ease of banking sector entry	Fewer capital account controls	Privatisation	Securities markets	Bank supervision	Aggregate index
G20								
2000-07	-0.04	-0.04	0.00	0.00	0.07	0.07	0.07	0.02
2007-15	-0.02	0.04	0.07	0.02	-0.09	0.05	0.09	0.02
OECD G20								
2000-07	0.00	-0.09	0.00	0.00	0.09	0.00	0.03	0.00
2007-15	-0.03	0.00	0.00	0.07	-0.09	0.03	0.06	0.01

5. Conclusion

37. The global financial crisis has triggered government action in financial policy across the globe, including the Basel III accord and re-nationalisation of several banks. This paper provides one way of gauging the scale of financial reforms pre- and post-crisis for OECD and G20 countries. It extends the financial reform index of the IMF by Abiad, Detragiache and Tressel (2010), the most widely used source for measuring financial policies in cross-country empirical research, from 2005 to 2015. Besides documenting financial reform trends, the data in the current paper are available for updating empirical studies relying on the ADT dataset.

Figure 10. Financial liberalisation across OECD and G20 countries



38. Based on the extension of the ADT index, financial liberalisation has come to a halt in advanced countries since the beginning of the global financial crisis. State ownership of banks has risen in a number of countries, bank supervision has been improved, and capital account controls, although already few at the start of the crisis, did not decline further. For emerging market economies, the picture has been somewhat different. Ease of banking sector entry, bank supervision, deregulation of securities markets and interest rate liberalisation are areas where financial reform has been strong. As a whole, financial liberalisation has continued in emerging market economies over the post-crisis period, in contrast to advanced countries.

39. As regards future work, this paper focused on extending the ADT data by another decade, while leaving aside considerations to modify, and improve, the indicator of financial liberalisation. Such lines of work could be the next steps in this research agenda.

APPENDIX A1. SCORING METHODOLOGY AND NOTES ON THE EXTENSION

40. This appendix describes the scoring methodology for the financial liberalisation index in Abiad, Detragiache and Tressel (2010) and provides notes relevant for the extension.

1. Credit controls

1.1. Are reserve requirements restrictive?

- Coded as 0 if reserve requirements are more than 20%.
- Coded as 1 if reserve requirements are between 10% and 20% or regulations to set reserve requirements are sufficiently simple so that reserve requirements are not overly high.
- Coded as 2 if reserve requirements are less than 10%.

1.2. Are there minimum amounts of credit that must be channelled to certain sectors?

- Coded as 0 if credit allocations are determined by the central bank or mandatory credit allocations to certain sectors exist.
- Coded as 1 if mandatory credit allocations to certain sectors are eliminated or do not exist.

1.3. Are there mandatory requirements on credit allocation at subsidised rates?

- Coded as 0 if banks have to supply credit at subsidised rates to certain sectors.
- Coded as 1 if the mandatory requirement of credit allocation at subsidised rates is eliminated or banks do not have to supply credit at subsidised rates.

Based on the sum of these questions, the scores are as follows:

- If sum = 4, score = 1 (fully liberalised).
- If sum = 3, score = 0.67 (largely liberalised).
- If sum = 1 or 2, score = 0.33 (partially repressed).
- If sum = 0, score = 0 (fully repressed).

Notes: Some countries in the current study have reserve requirements that vary according to both maturity and currency of denomination (e.g. Argentina, Poland, Turkey). With respect to Questions 1.2 and 1.3, for a small number of countries no information on the existence of such policies could be found, even though according to the ADT index such policies were in place during 2000-05. When this was the case, the current paper favoured consistency and extended the values in ADT.

2. Interest rate controls

Deposit and lending rates are separately considered when coding this measure. They are coded as being government set (code = 0), subject to a ceiling or floor (code = 1) or freely floating (code = 2). The coding is based on the matrix in Table A1.1.

Table A1.1. Coding rule for interest rate liberalisation

Lending rates	Deposit rates		
	0	1	2
0	0 (fully repressed)	0.33 (partially repressed)	0.33 (partially repressed)
1	0.33 (partially repressed)	0.33 (partially repressed)	0.67 (largely liberalised)
2	0.33 (partially repressed)	0.67 (largely liberalised)	1 (fully liberalised)

Notes: It is somewhat common practice to have anti-usury laws that fix ceilings on lending rates. When such laws fix a limit rate as a function of the market rate (e.g. in the Czech Republic, France, Italy) or a function of the central bank's credit rate (Poland), this paper considers lending rates to be liberalised. Conversely, when the lending ceiling is a fixed value (as it is in Korea), it considers lending rates to be partially repressed. Values remain the same for the countries which had their interest rates fully liberalised in 2005 and were not covered by any of the sources available.

3. Banking sector entry

3.1. To what extent are foreign banks allowed to enter the domestic market?

- Coded as 0 if no entry of foreign banks is allowed.
- Coded as 1 if foreign bank entry is allowed, but non-residents must hold less than 50% equity share.
- Coded as 2 if the majority of share of equity ownership of domestic banks by non-residents is allowed or equal treatment is ensured for both foreign banks and domestic banks.

3.2. Are new domestic banks allowed to enter the market?

- Coded as 0 if the entry of new domestic banks is not allowed or strictly regulated by the government.
- Coded as 1 if the entry of new domestic banks or other financial institutions is allowed into the domestic market.

3.3. Are there restrictions on branching?

- Coded as 0 if there are tight branching restrictions in place.
- Coded as 1 if there are no or few branching restrictions in place.

3.4. *Are banks allowed to become universal banks?*

- Coded as 0 if banks can only engage in banking activities.
- Coded as 1 if banks are allowed to become universal banks.

Based on the sum of these questions, the scores are as follows:

- If sum = 4 or 5, score = 1 (fully liberalised).
- If sum = 3, score = 0.67 (largely liberalised).
- If sum = 1 or 2, score = 0.33 (partially repressed).
- If sum = 0, score = 0 (fully repressed).

4. **Capital account controls**

Notes: In ADT, this component includes three questions: *i)* “Is the exchange rate unified?”; *ii)* “Are there restrictions on capital inflows?”; and *iii)* “Are there restrictions on capital outflows?”. These questions are captured by the Chinn-Ito index, which measures a country’s degree of capital account openness. The index was initially introduced by Chinn and Ito (2006) and codifies the tabulation of restrictions on cross-border financial transactions in the IMF’s Annual Report on Exchange Arrangements and Exchange Restrictions. The current paper replaces this dimension in ADT with the latest update of the Chinn-Ito index, which was released in June 2016. The Chinn-Ito index has been standardised to lie between 0 and 1.

5. **Privatisation**

- If less than 10% of bank assets are state-owned, score = 1 (fully liberalised).
- If more than 10% and less than 25% of bank assets are state-owned, score = 0.67 (largely liberalised).
- If more than 25% and less than 50% of bank assets are state-owned, score = 0.33 (partially repressed).
- If more than 50% of bank assets are state-owned, score = 0 (fully repressed).

6. **Securities markets**

6.1. *To what extent are securities markets developed?*

- Coded as 0 if a securities market does not exist.
- Coded as 1 if a securities market is starting to form with the introduction of auctioning of treasury bills or the establishment of a security commission.
- Coded as 2 if further measures have been taken to develop securities markets (tax exemptions, introduction of medium- and long-term government bonds to build the benchmark of a yield curve, policies to develop corporate bond and equity markets or the introduction of a primary dealer system to develop government security markets).

- Coded as 3 if further policy measures have been taken to develop derivative markets or to broaden the institutional investor base by deregulating portfolio investments and pension funds or completing the full deregulation of stock exchanges.

6.2. Is a country's equity market open to foreign investors?

- Coded as 0 if no foreign equity ownership is allowed.
- Coded as 1 if foreign equity ownership is allowed up to 50% foreign ownership.
- Coded as 2 if a majority equity share of foreign ownership is allowed.

Based on the sum of these questions, the scores are as follows:

- If sum = 4 or 5, score = 1 (fully liberalised).
- If sum = 3, score = 0.67 (largely liberalised).
- If sum = 1 or 2, score = 0.33 (partially repressed).
- If sum = 0, score = 0 (fully repressed).

7. Banking sector supervision

7.1. Has a country adopted a capital adequacy ratio based on the latest Basel standard?

- Coded as 0 if the latest Basel risk-weighted capital adequacy ratio has not been adopted.
- Coded as 1 if the latest Basel capital adequacy ratio has been adopted.

7.2. Is the banking supervisory agency independent from executives' influence?

- Coded as 0 if the banking supervisory agency does not have an adequate legal framework to promptly intervene in banks' activities or when there is a lack of legal framework for the independence of the supervisory agency, such as the appointment and removal of the head of the banking supervisory agency or when a frequent turnover of the head of the supervisory agency is experienced.
- Coded as 1 if the objective of the supervisory agency is clearly defined and an adequate legal framework to resolve banking problems is provided (the revocation and suspension of authorisation of banks, liquidation of banks, the removal of banks' executives), but potential problems remain concerning the independence of the banking supervisory agency (for example, when the Ministry of Finance may intervene into the banking supervision in such a case that the board of the banking supervisory agency is chaired by the Ministry of Finance, although the fixed term of the board is ensured by law) or, although clear legal objectives and legal independence are observed, the adequate legal framework for resolving problems is not well articulated.
- Coded as 2 if a legal framework for the objectives and the resolution of troubled banks is set up and the banking supervisory agency is legally independent from the executive branch and not interfered with by the executive branch.

7.3. *Does the banking supervisory agency conduct effective supervision through on-site and off-site examinations?*

- Coded as 0 if a country has no legal framework and practices of on-site and off-site examinations or if no on-site and off-site examinations are conducted.
- Coded as 1 if the legal framework of on-site and off-site examinations is set up and the banking supervisory agency conducts examinations, but in an ineffective or insufficient manner.
- Coded as 2 if the banking supervisory agency conducts effective and sophisticated examinations.

7.4. *Does a country's banking supervisory agency cover all financial institutions without exception?*

- Coded as 0 if some kinds of financial institutions are not exclusively supervised by the banking supervisory agency or are excluded from banking supervisory agency oversight.
- Coded as 1 if all banks are under supervision of supervisory agencies without exception.

Based on the sum of these questions, the scores are as follows:

- If sum = 6, score = 1 (fully liberalised).
- If sum = 4 or 5, score = 0.67 (largely liberalised).
- If sum = 2 or 3, score = 0.33 (partially repressed).
- If sum = 0 or 1, score = 0 (fully repressed).

APPENDIX A2. FINANCIAL LIBERALISATION IN 2015 IN OECD AND G20 COUNTRIES

Figure A2.1. Argentina

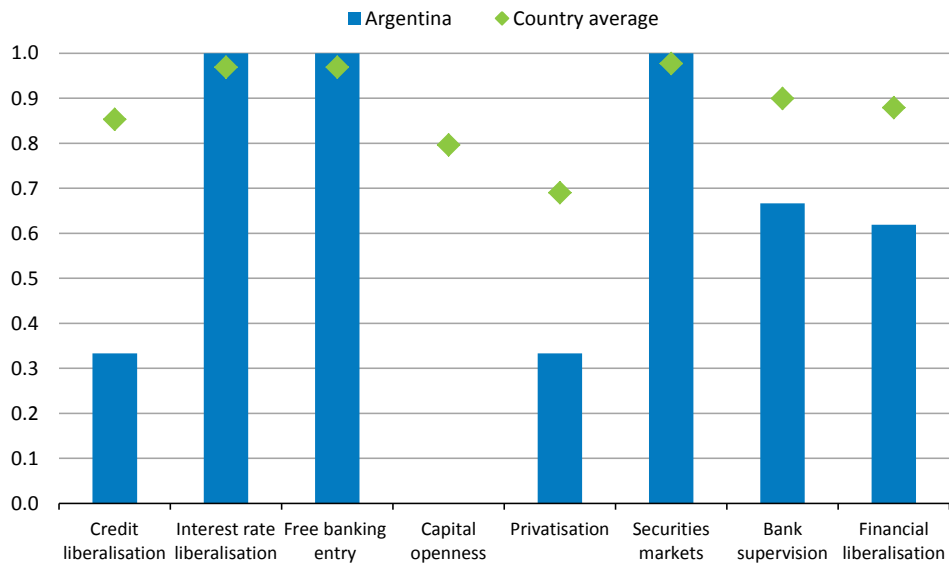


Figure A2.2. Australia

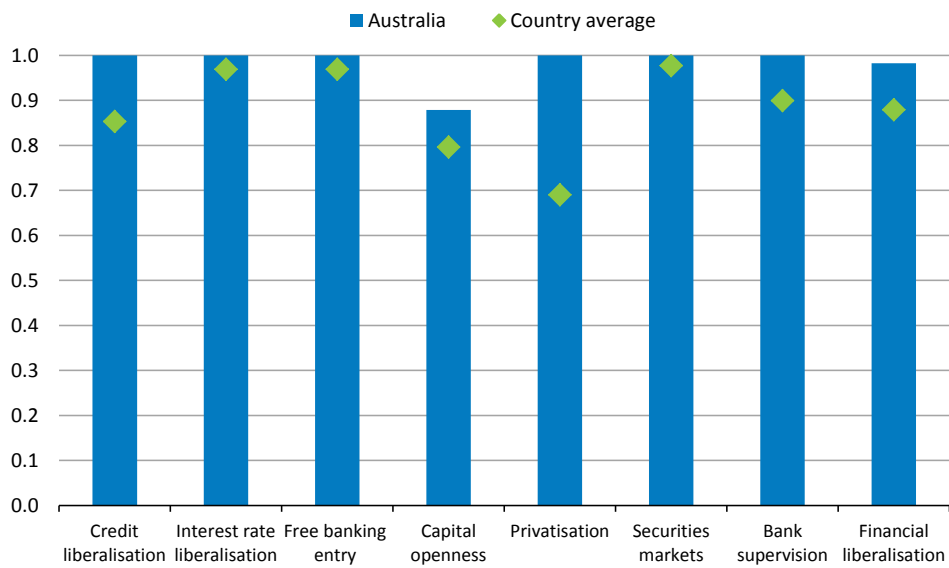


Figure A2.3. Austria

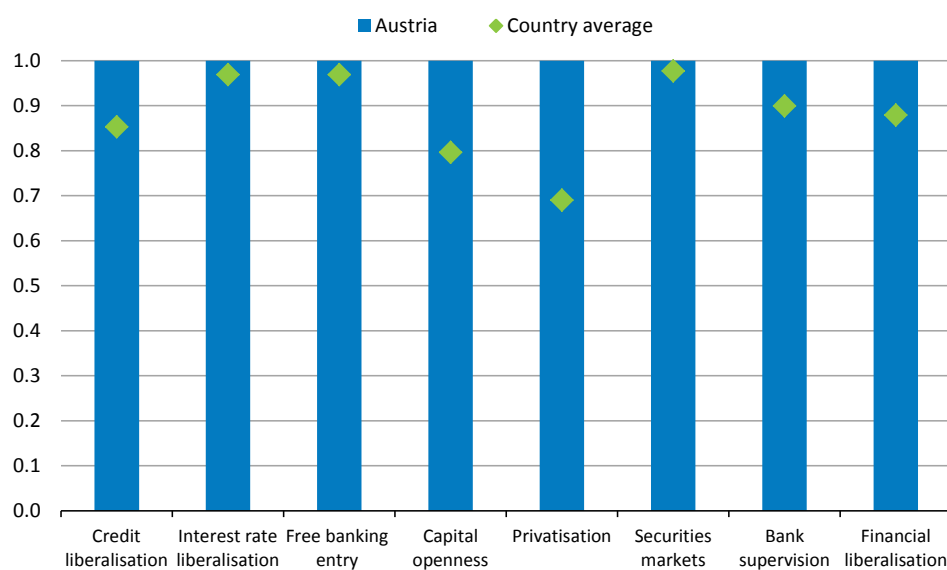


Figure A2.4. Belgium

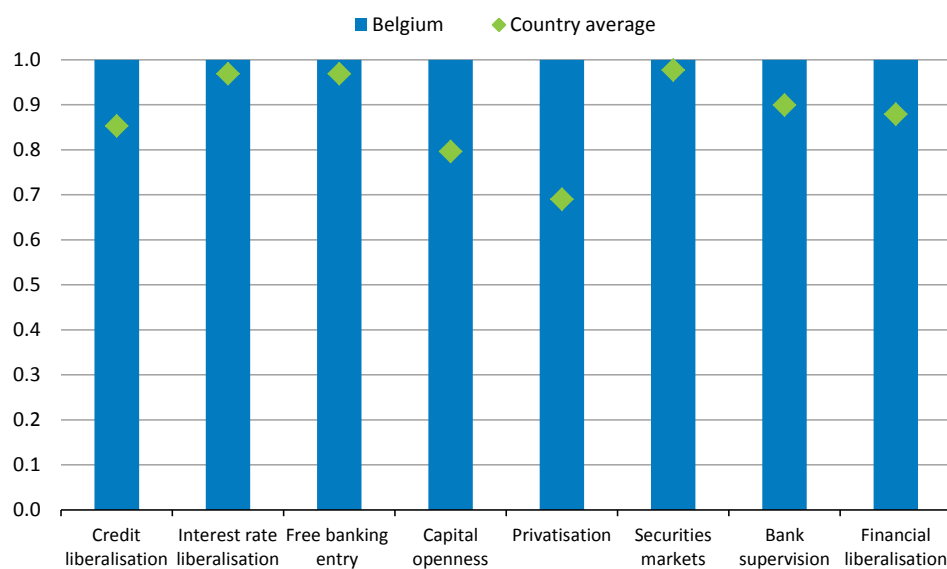


Figure A2.5. Brazil

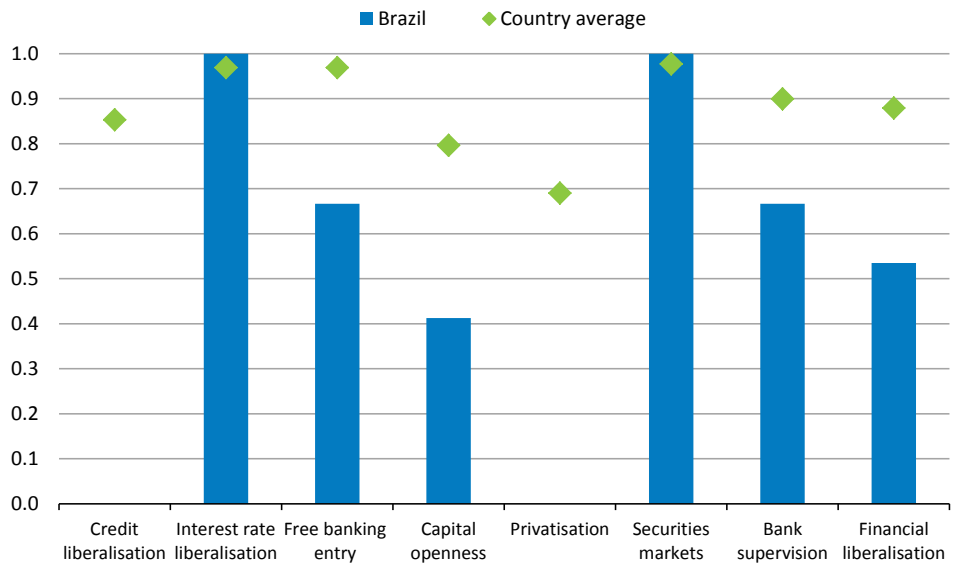


Figure A2.6. Canada

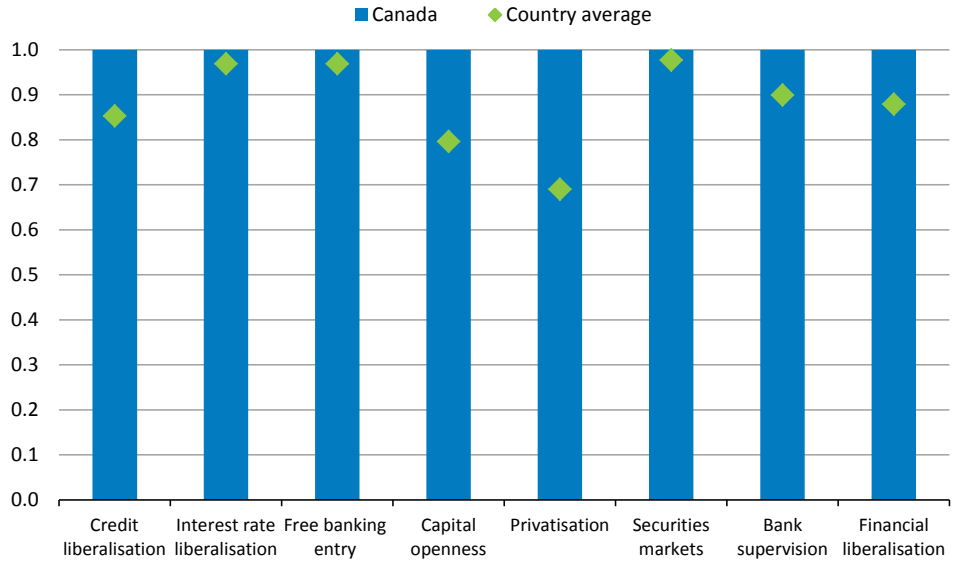


Figure A2.7. Chile

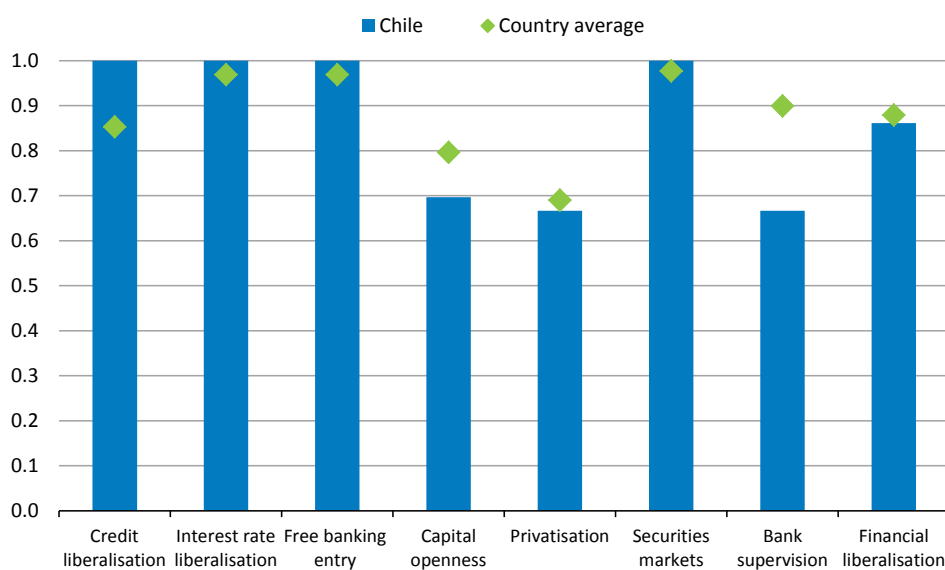


Figure A2.8. China

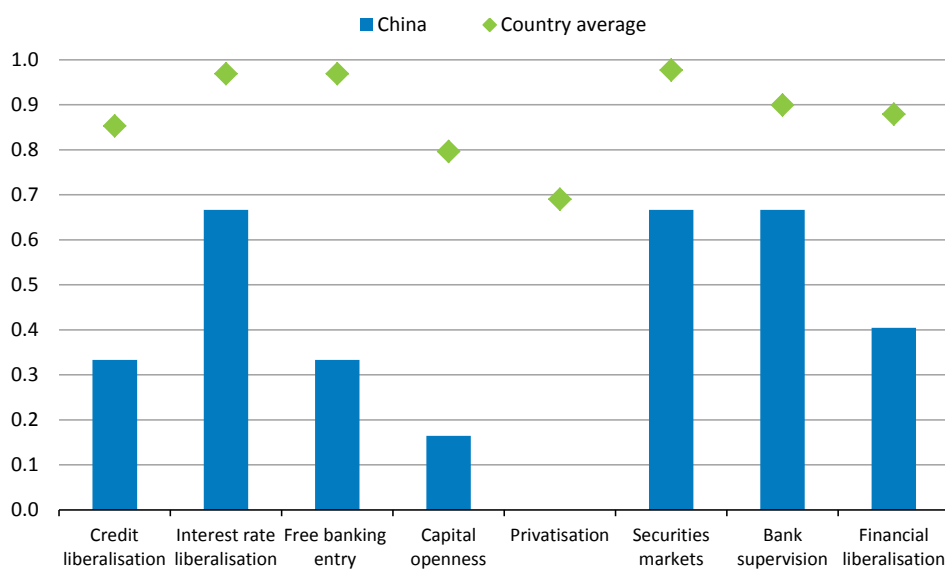


Figure A2.9. Czech Republic

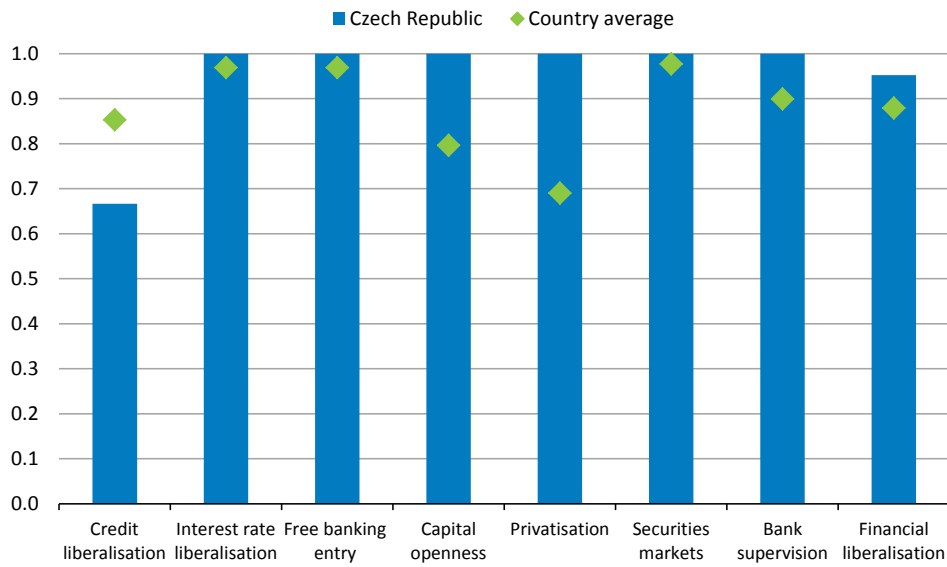


Figure A2.10. Denmark

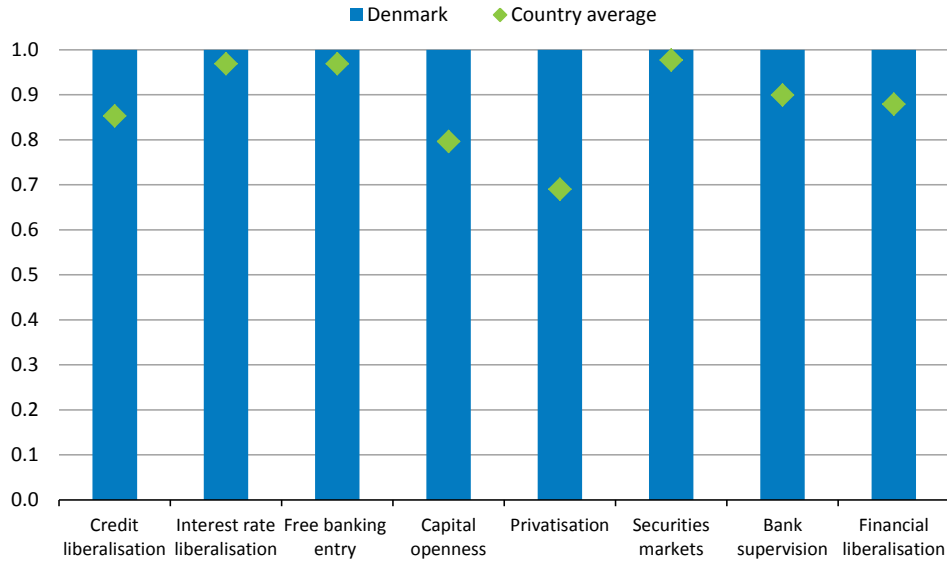


Figure A2.11. Estonia

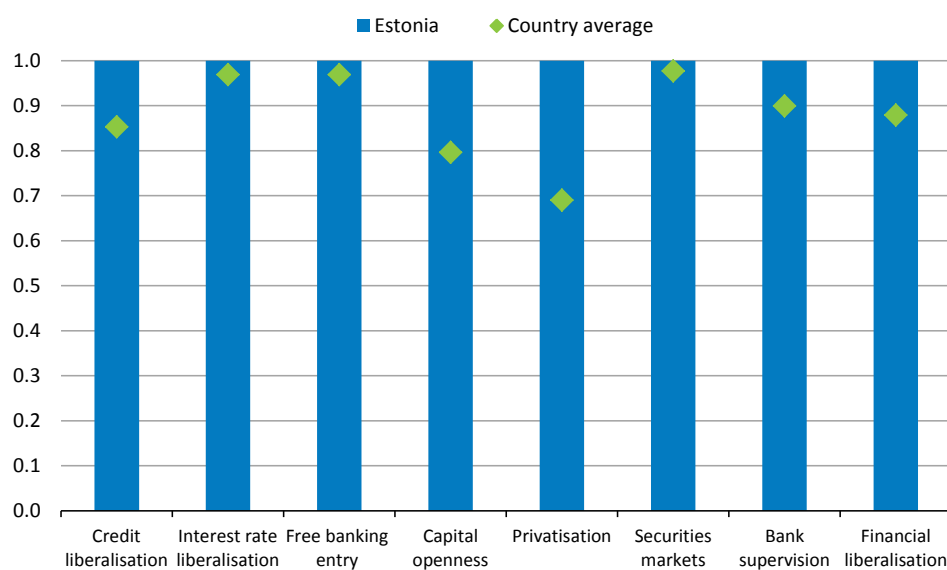


Figure A2.12. Finland

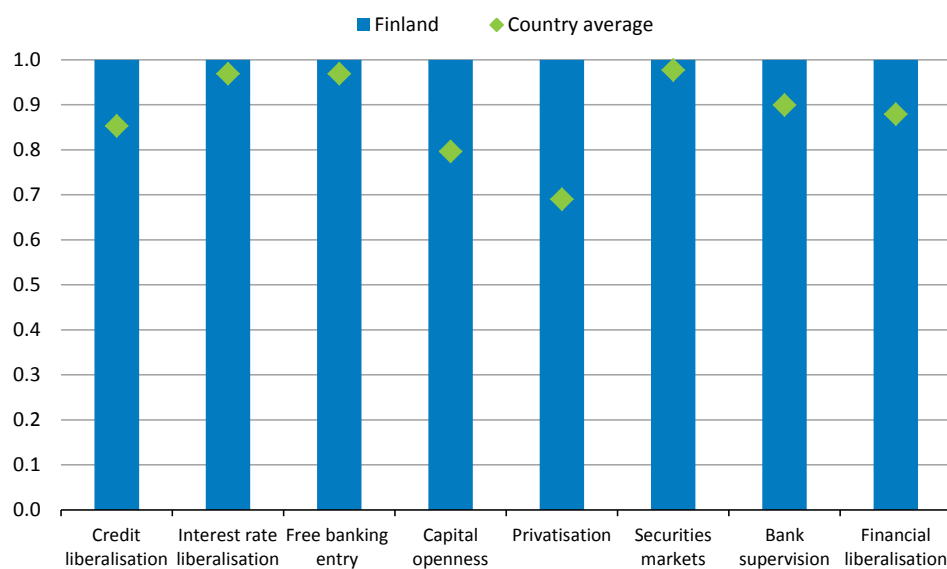


Figure A2.13. France

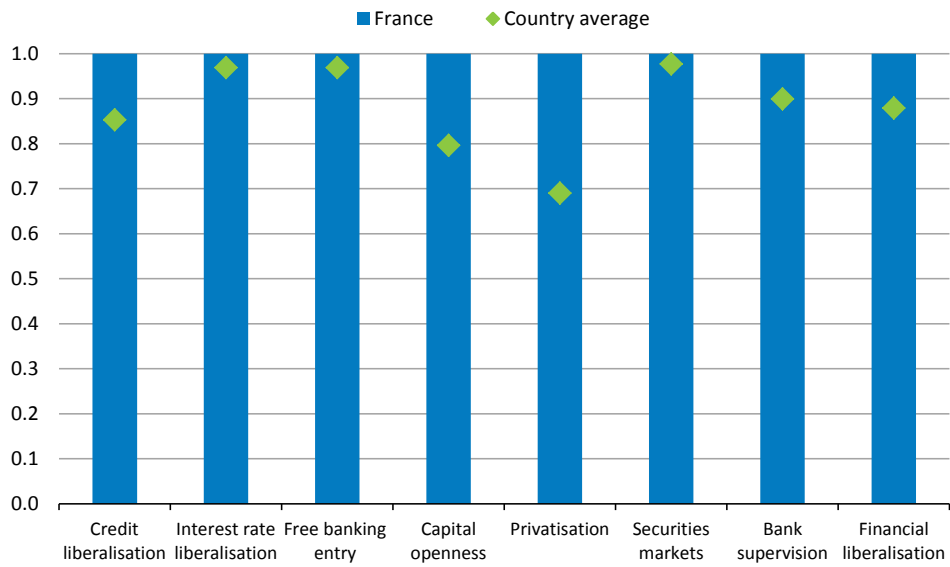


Figure A2.14. Germany

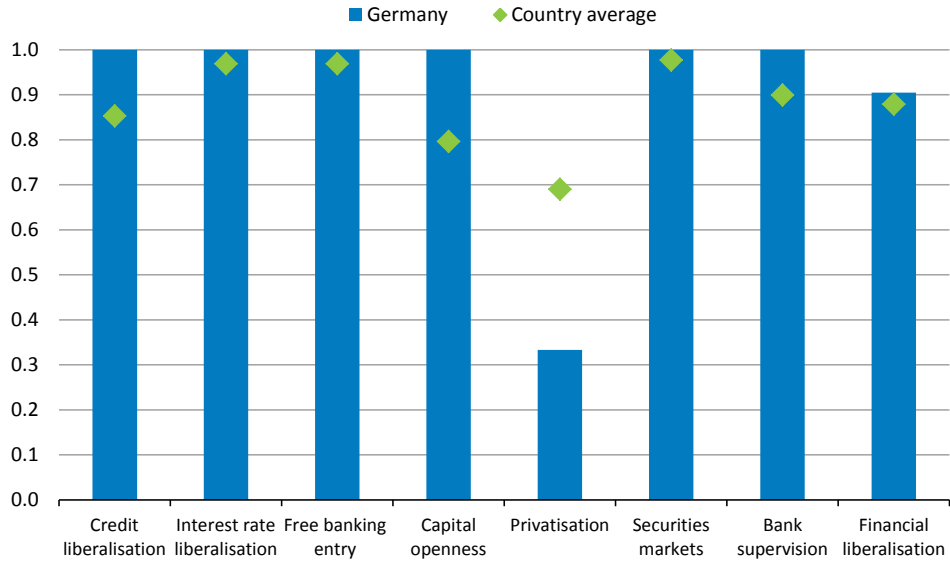


Figure A2.15. Greece

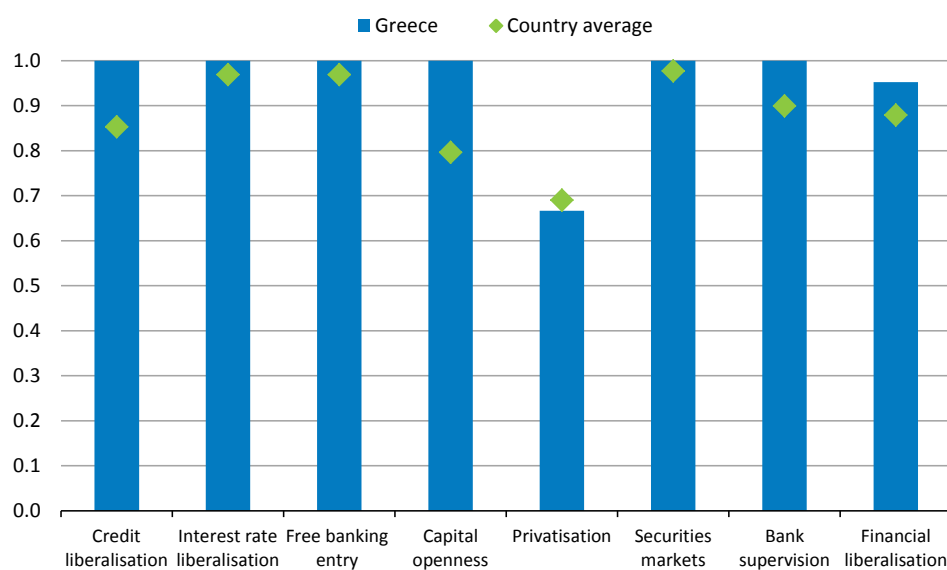


Figure A2.16. Hungary

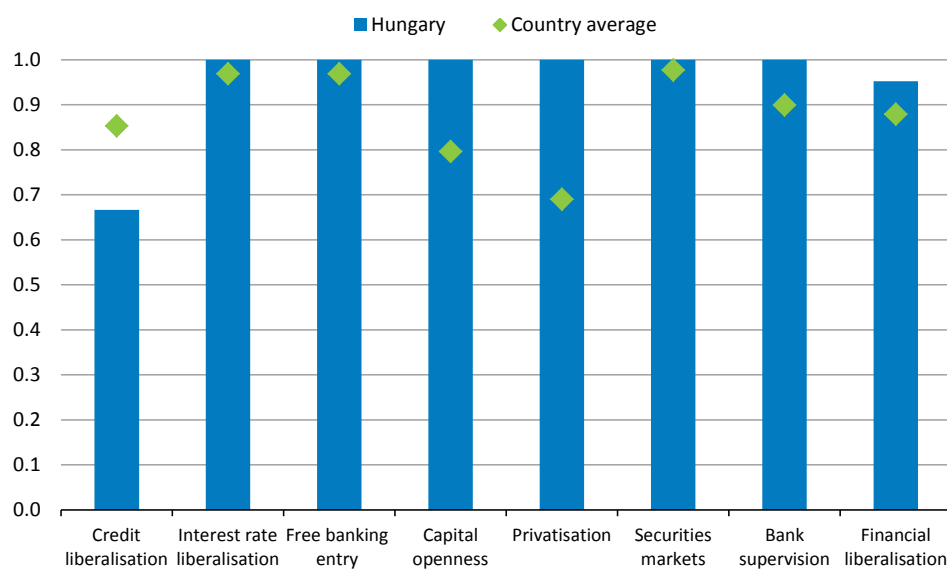


Figure A2.17. Iceland

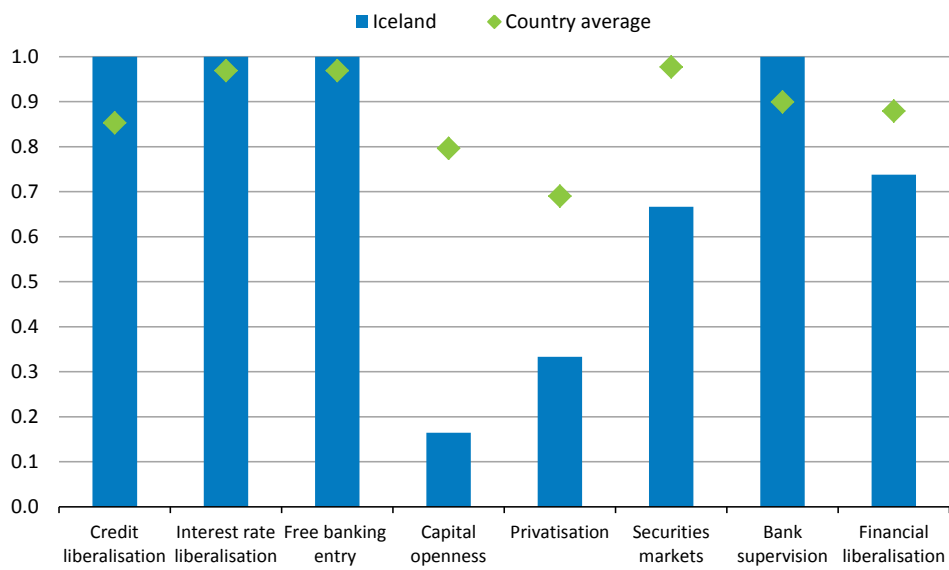


Figure A2.18. India

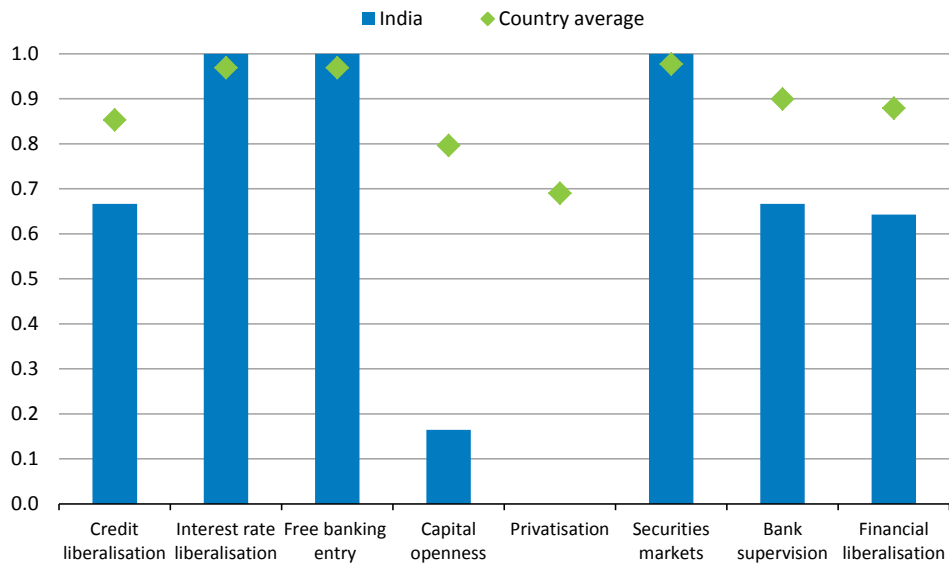


Figure A2.19. Indonesia

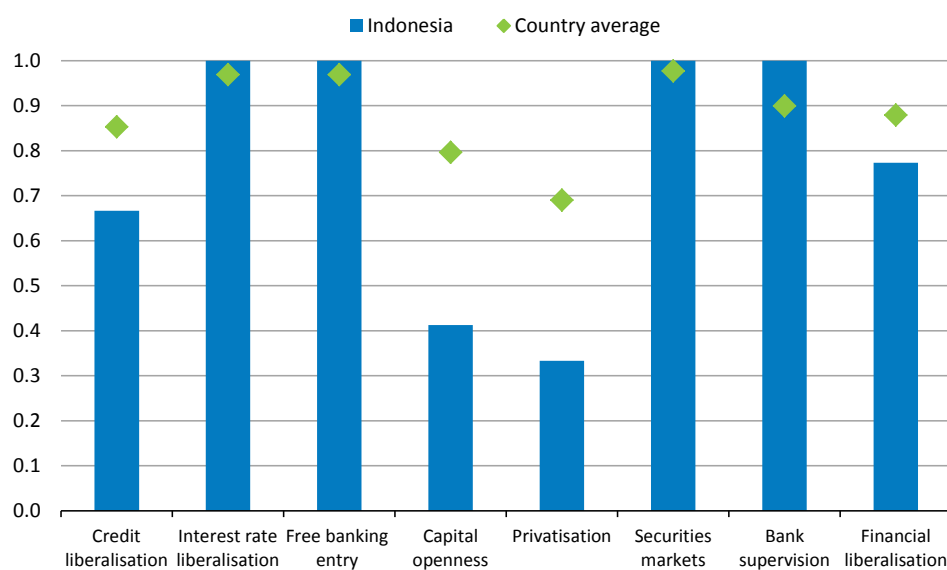


Figure A2.20. Ireland

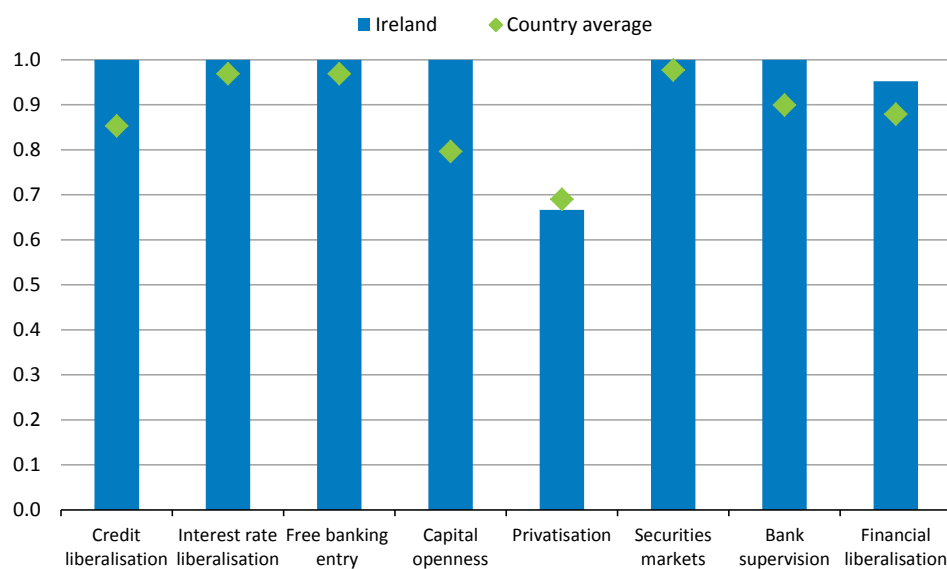


Figure A2.21. Israel

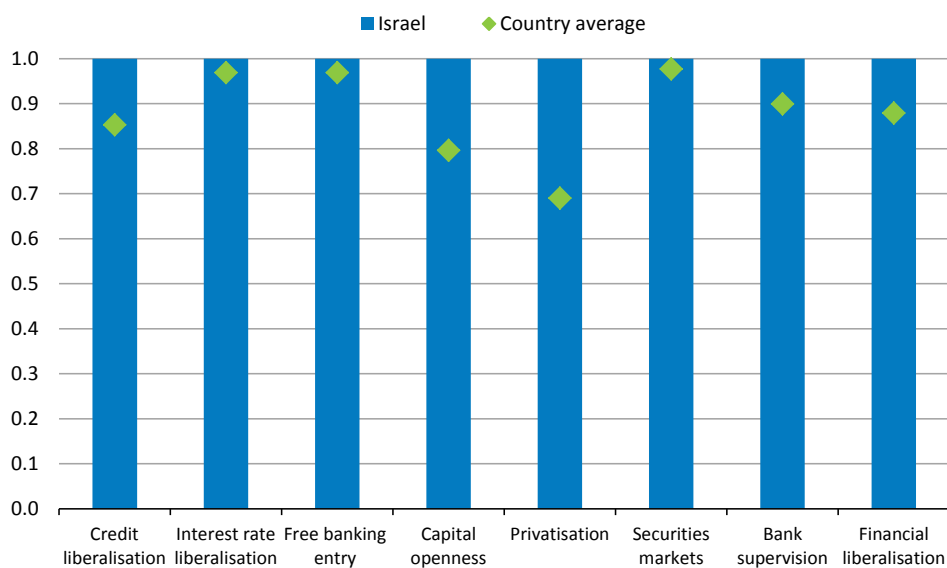


Figure A2.22. Italy

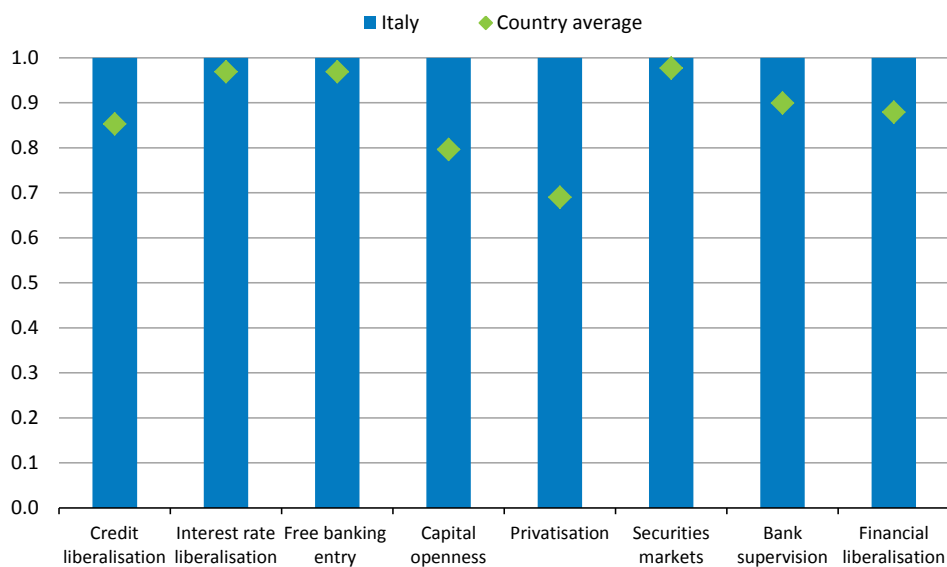


Figure A2.23. Japan

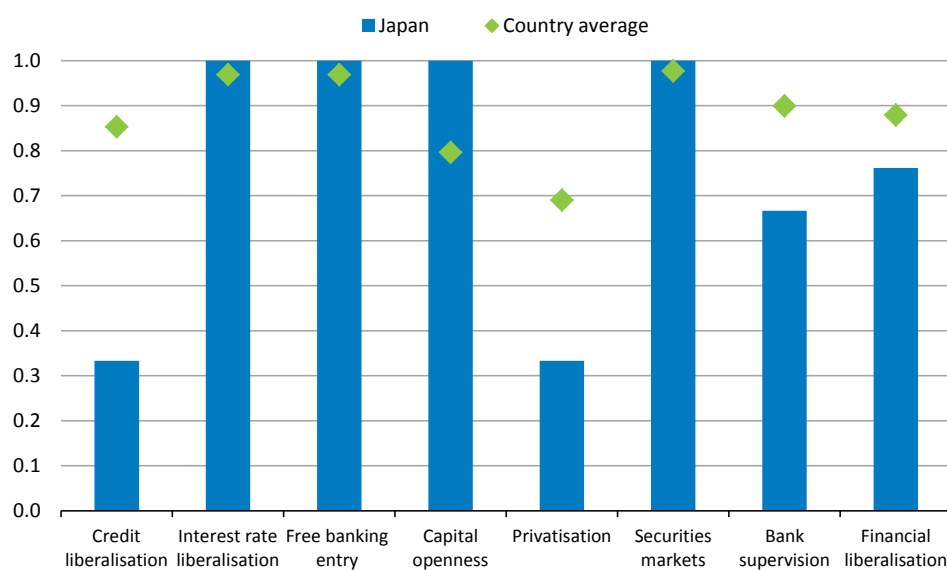


Figure A2.24. Korea

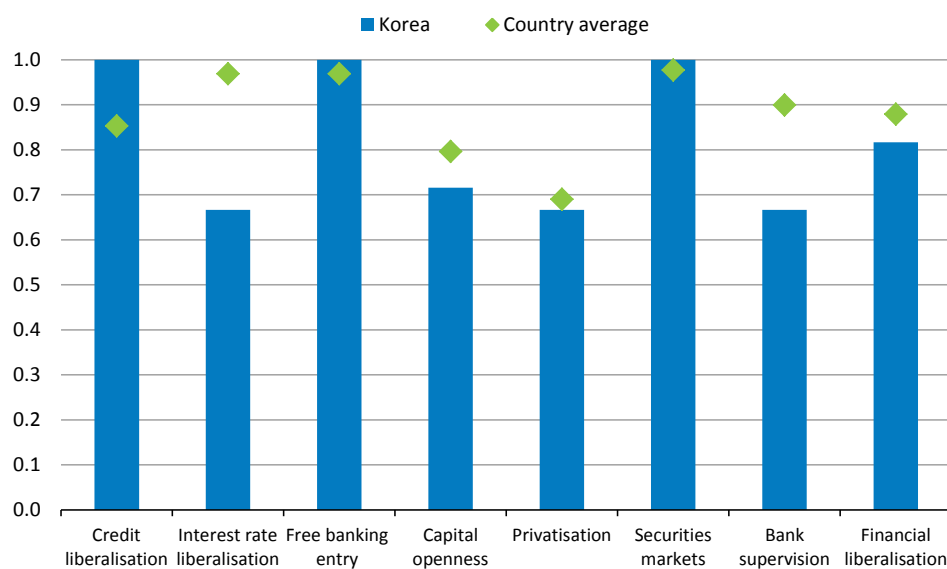


Figure A2.25. Latvia

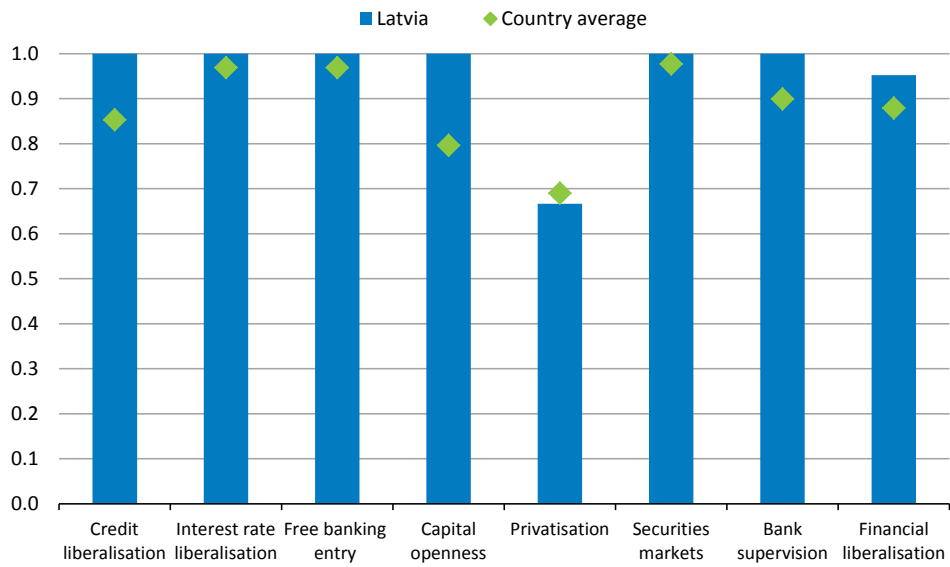


Figure A2.26. Luxembourg

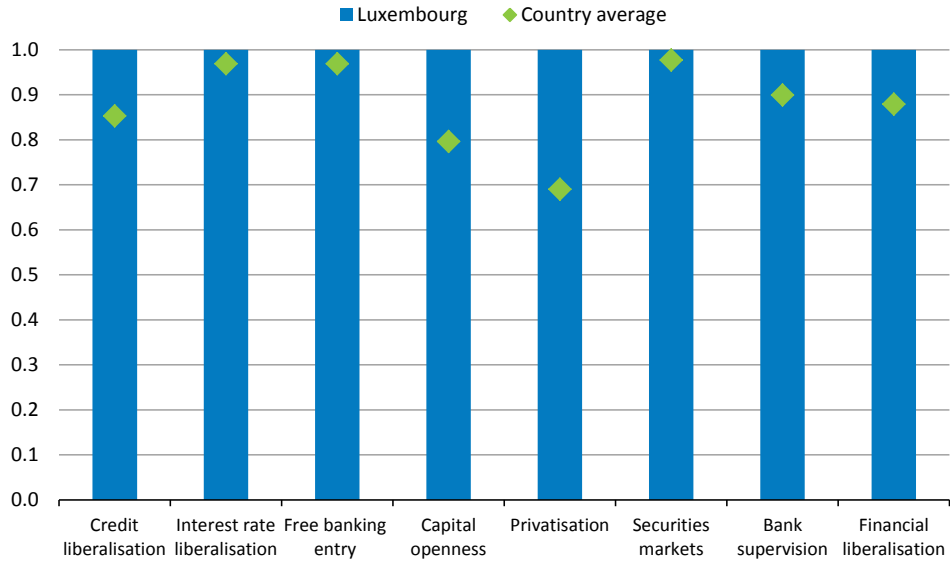


Figure A2.27. Mexico

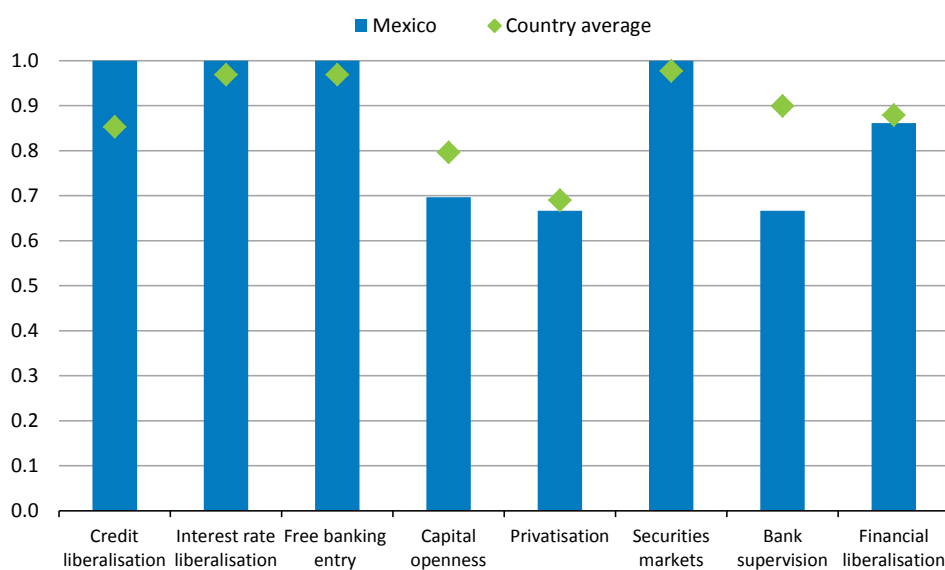


Figure A2.28. Netherlands

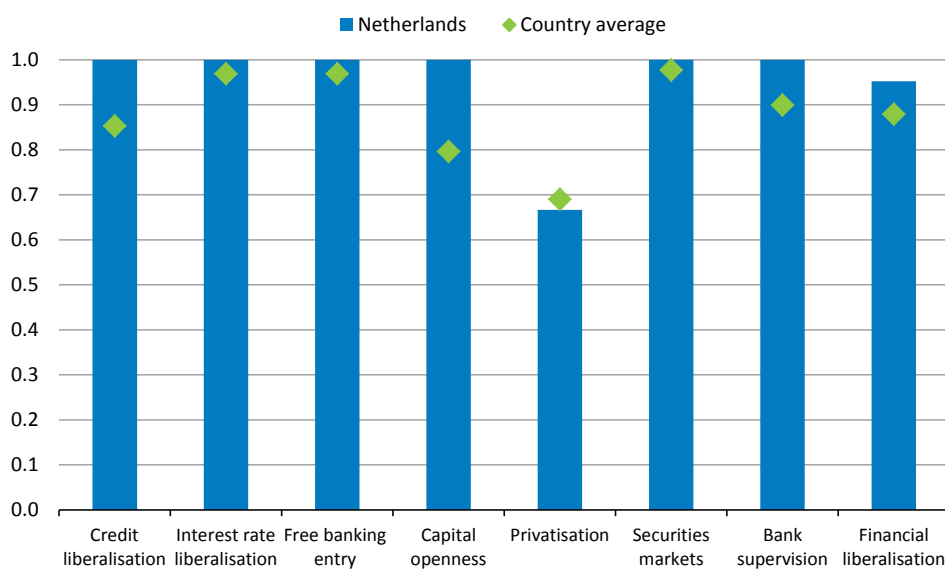


Figure A2.29. New Zealand

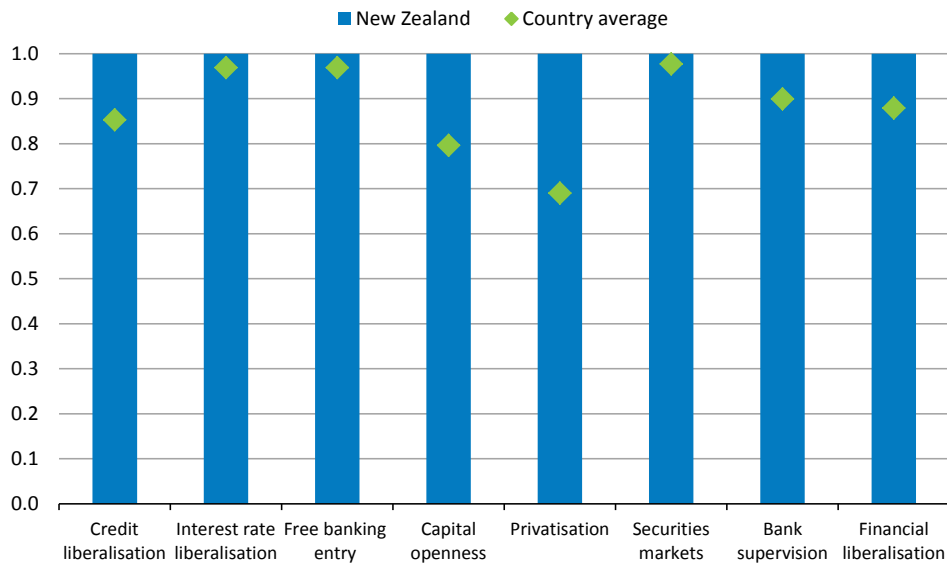


Figure A2.30. Norway

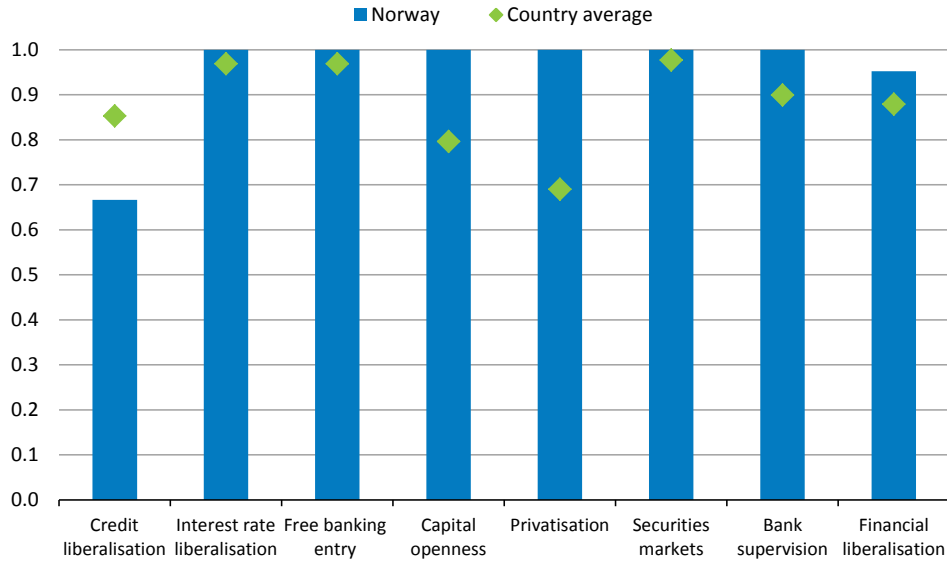


Figure A2.31. Poland

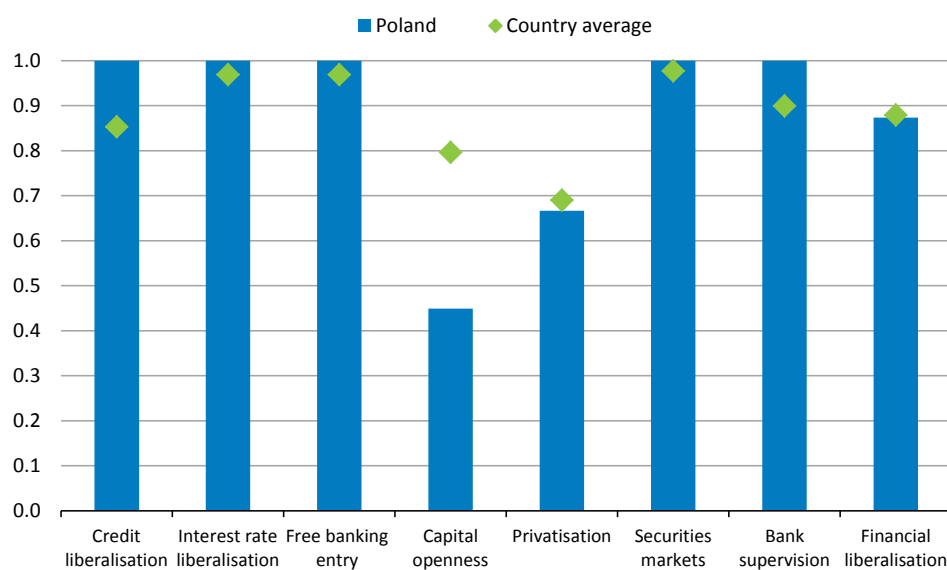


Figure A2.32. Portugal

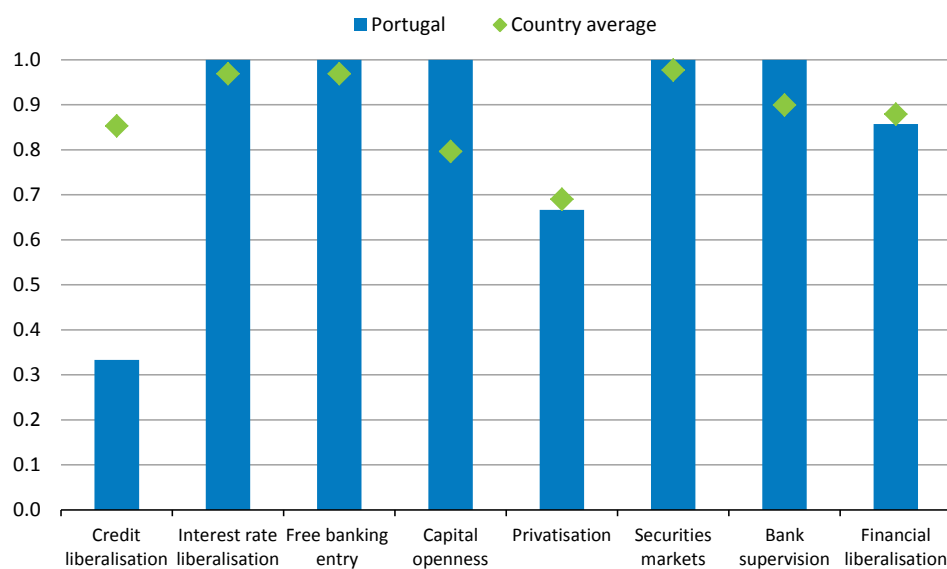


Figure A2.33. Russian Federation

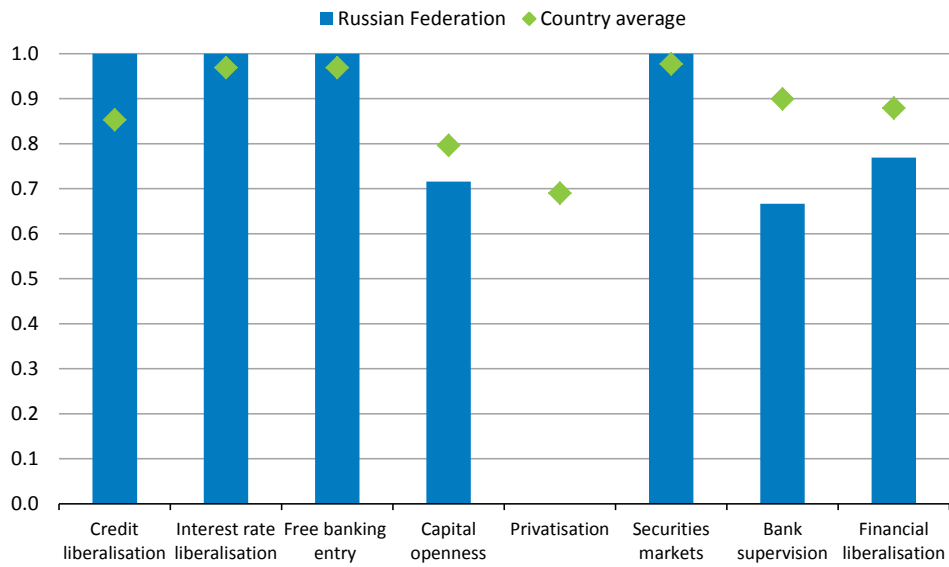


Figure A2.34. Saudi Arabia

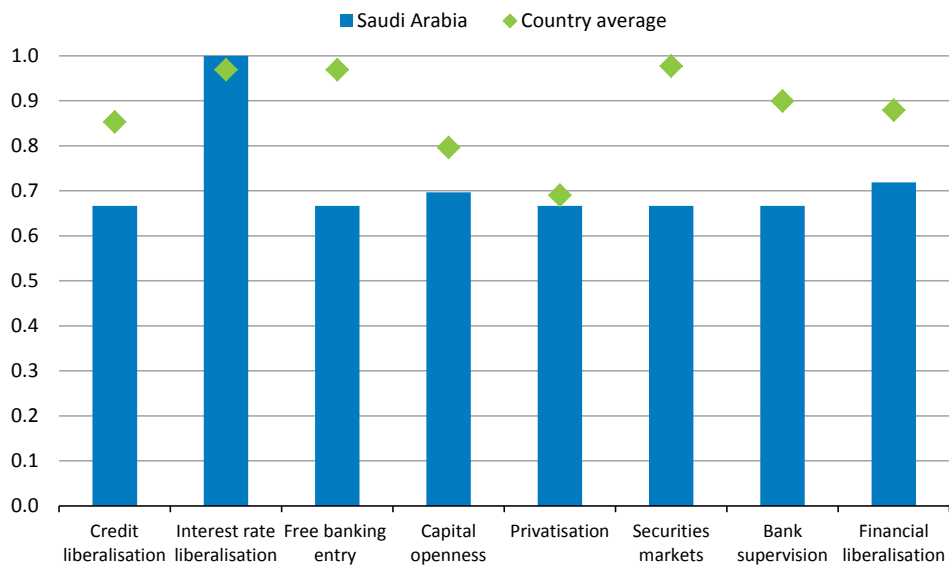


Figure A2.35. Slovak Republic

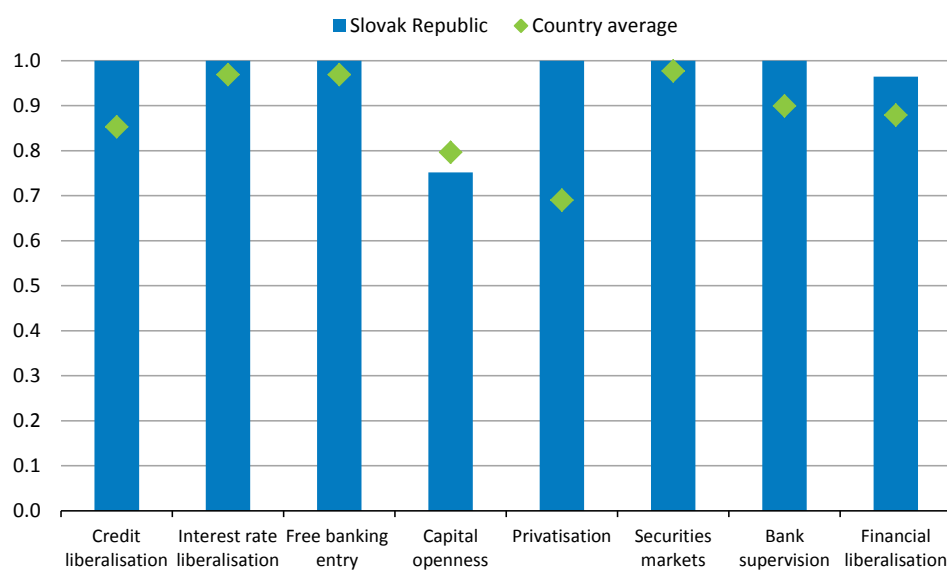


Figure A2.36. Slovenia

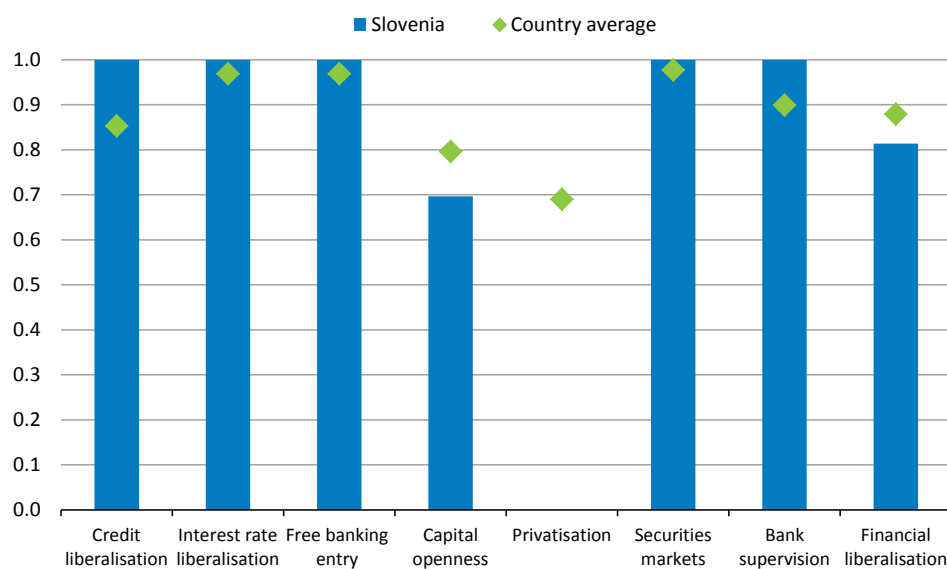


Figure A2.37. South Africa

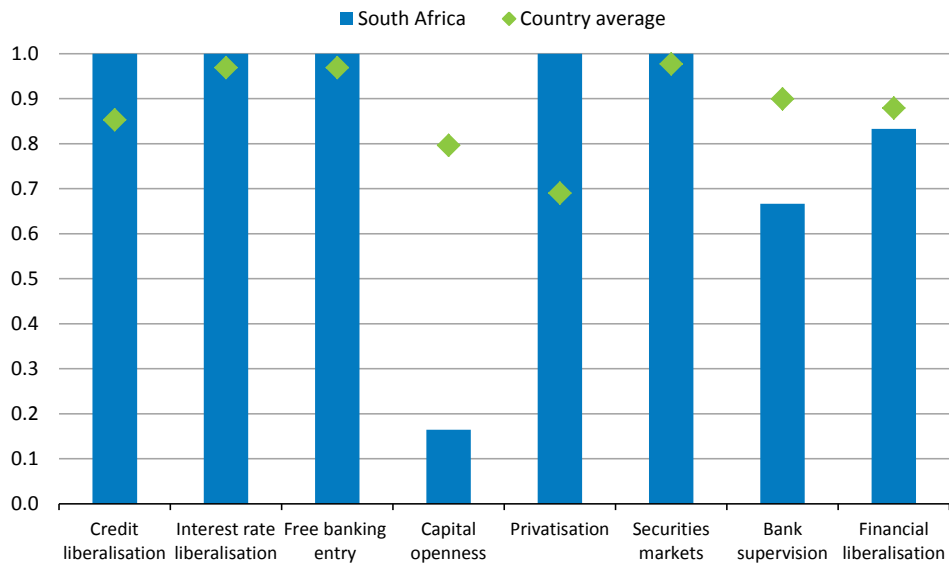


Figure A2.38. Spain

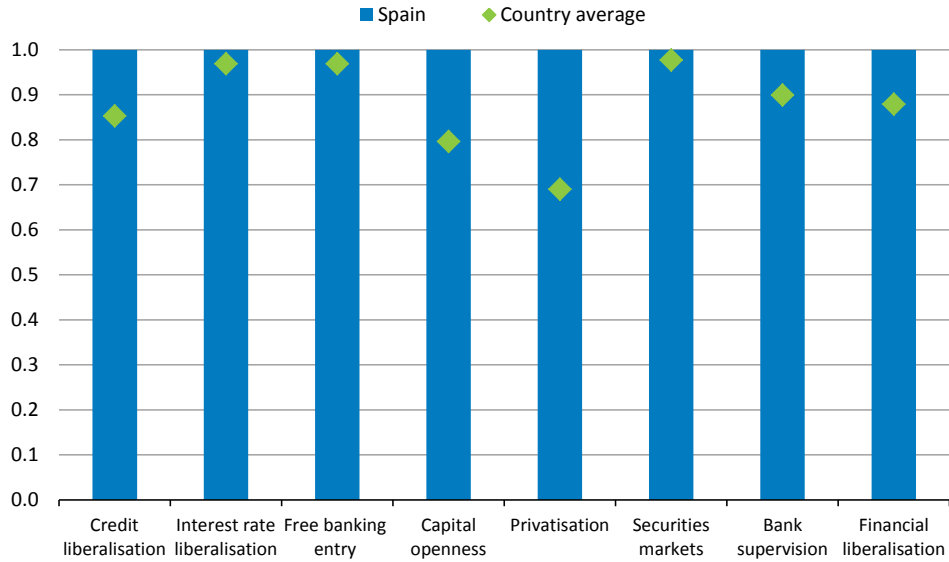


Figure A2.39. Sweden

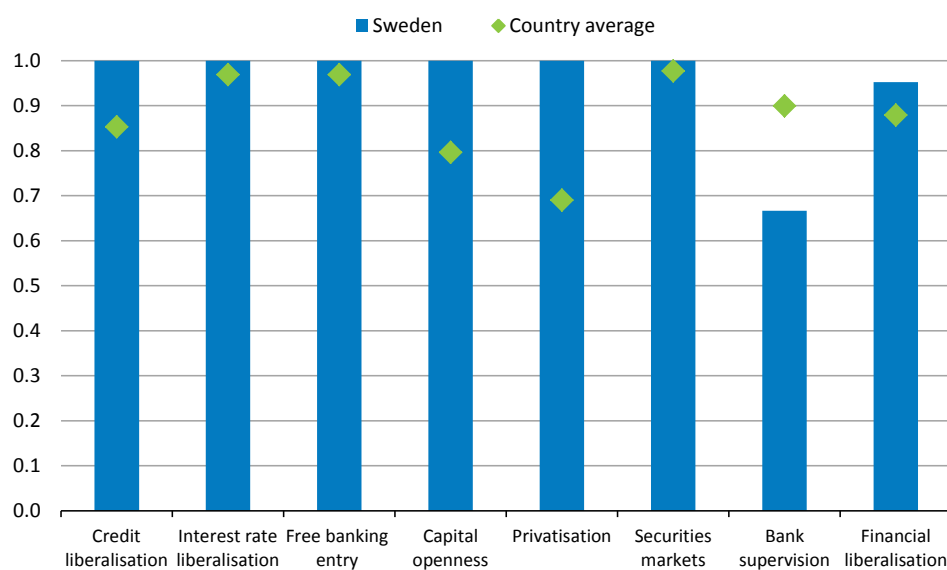


Figure A2.40. Switzerland

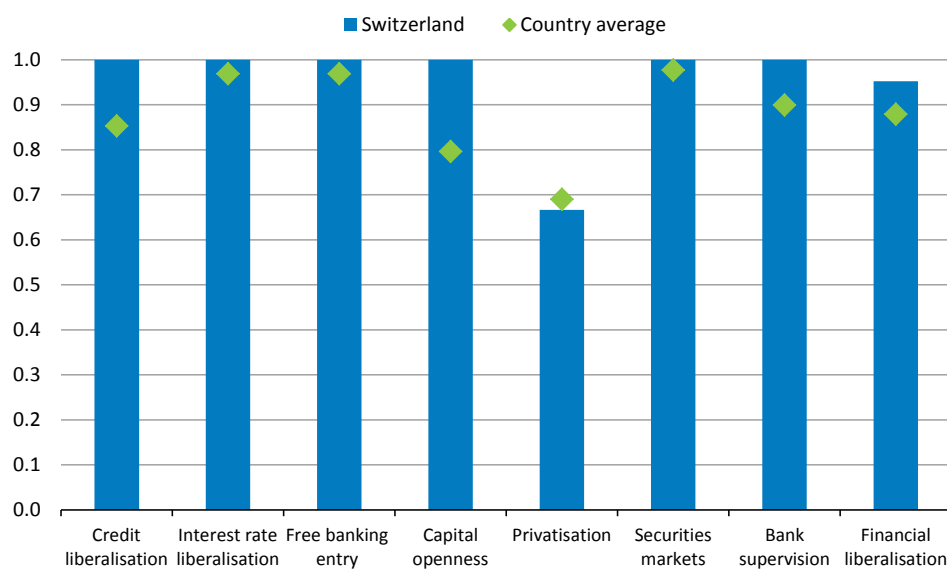


Figure A2.41. Turkey

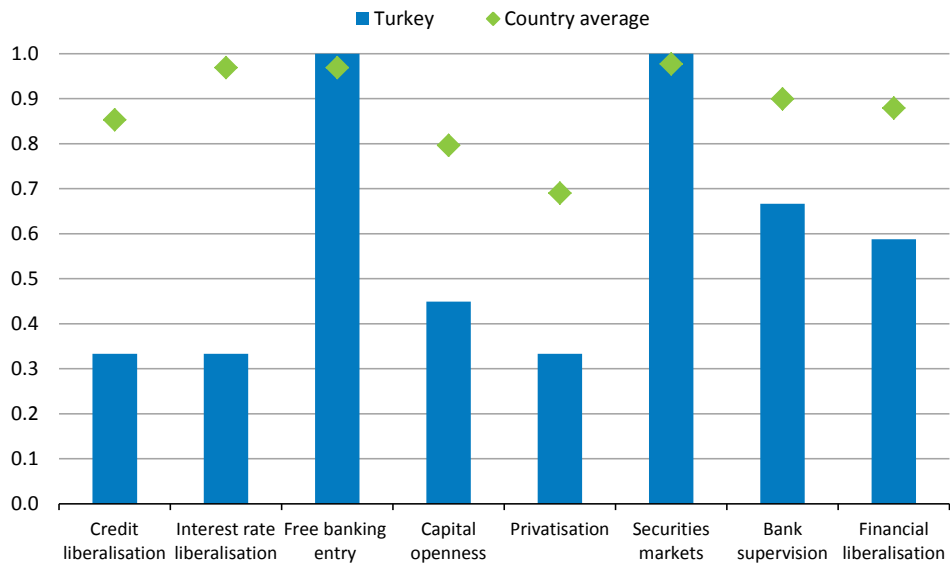


Figure A2.42. United Kingdom

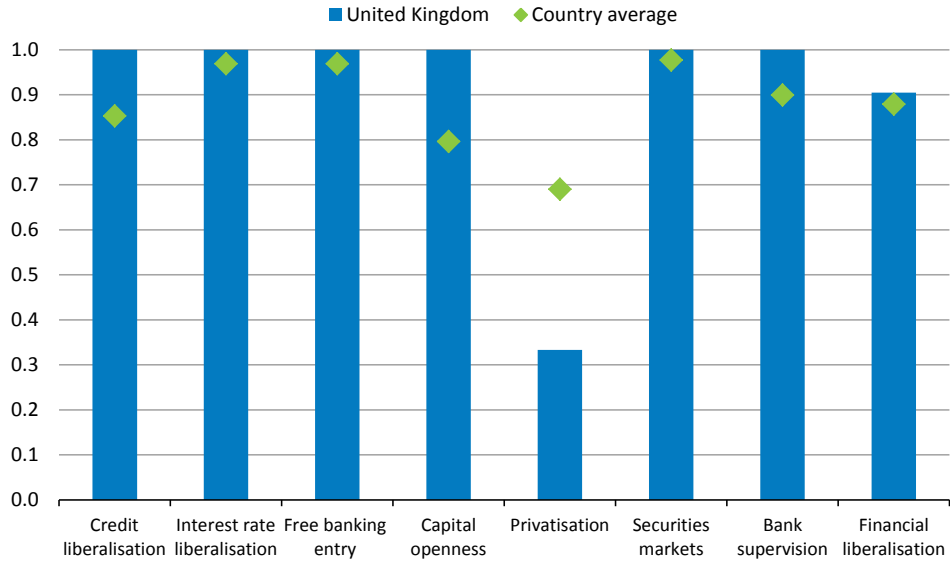
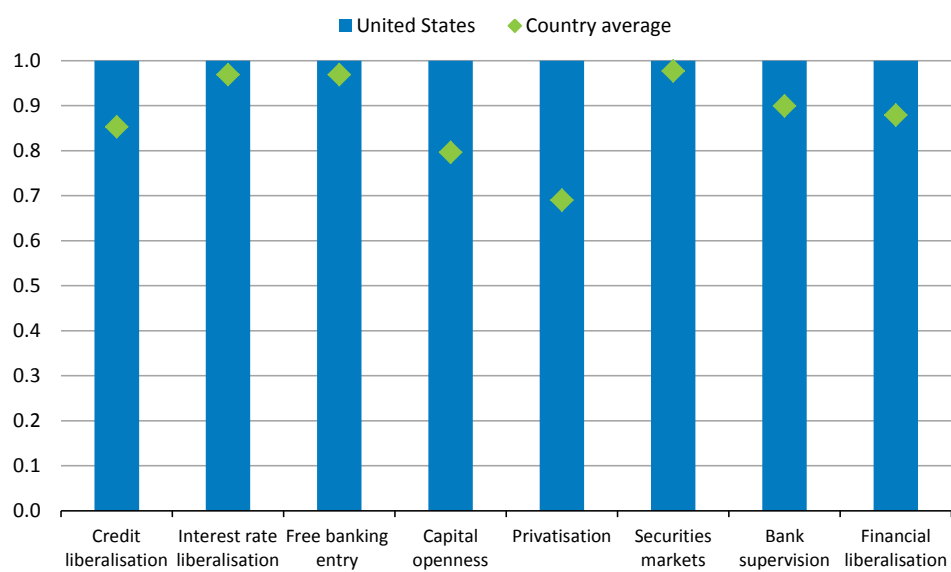


Figure A2.43. United States



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