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Tax Policy Measures in Advanced and Emerging Economies: A Novel Database

David Amaglobeli, Valerio Crispolti, Era Dabla-Norris, Pooja Karnane, and Florian Misch

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Tax Policy Measures in Advanced and Emerging Economies: A Novel Database

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Abstract

This paper describes a new, comprehensive database of tax policy measures in 23 advanced and emerging market economies over the last four decades. We extract this information from more than 900 OECD Economic Surveys and 37,000 tax-related news from the International Bureau of Fiscal Documentation using text-mining techniques. The innovation of this dataset lies in its granularity: changes in the rates and bases of personal and corporate income taxes, value added and sale taxes, social security contributions, excise, and property taxes are systematically documented. In addition, the database provides information on the announcement and implementation dates, whether the measures represent major changes, are part of a broader tax package, and phased in over several years. The paper also presents a range of stylized facts suggesting that information from this database is useful to deepen the analysis of tax policy changes for research and policy purposes.

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I. INTRODUCTION

Tax policy measures that mobilize additional revenue, enhance competitiveness, and boost productivity remain at the center stage of policy debates in many advanced and emerging market economies (IMF, 2016 and 2017). Tax policy is under constant reform, but it is very cumbersome to obtain detailed information of what transpired in different countries, beyond changes to basic parameters such as tax rates. The study of past reforms and their impacts, however, is crucial to gauge the impact of future reforms and develop informed advice on viable reform directions.

This paper introduces a new, comprehensive database of tax policy measures adopted in 23 advanced and emerging market economies over the last four decades—the Tax Policy Reform Database (TPRD). The TPRD contains more granular information on tax policy actions compared to existing databases. Tax measures are extracted from more than 900 Organization for Economic Cooperation and Development (OECD) Economic Surveys and 37,000 tax-related news from the archives of the International Bureau of Fiscal Documentation (IBFD)[1] using text mining techniques (see Gentzkow and others, 2017).[2,3]

The innovation of the TPRD lies in the systematic documentation of the direction of changes in rates and tax base for six different tax types—personal (PIT) and corporate (CIT) income taxes, value added and sale taxes (VAT), social security contributions (SSC), excises (EXE), and property taxes (PRO). The database also contains information on the exact announcement and implementation dates of tax measures (e.g., day and/or month and year), whether the measures represented major tax changes (e.g., tax reforms), and if they were phased over multiple years. For fiscal consolidation years, as defined in Alesina and others (2017) and Dabla-Norris and Lima (forthcoming), the database reports governments' estimates of the intended revenue yield, when available. Moreover, the raw data is such that more granular categorizations are possible as needed for policymakers and researchers.

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[1] The IBFD is a pre-eminent independent (non-profit) foundation established in 1938 with the goal to supply information concerning (the application of) tax law and to promote the development of tax science. IBFD archives are accessible to subscribers through the Tax Portal (https://www.ibfd.org/IBFD-Tax-Portal).

[2] This approach is similar to Duval and others (2018) who also use OECD Economic Surveys to document major structural reforms of labor and product markets in OECD countries.

[3] The database is currently available in excel format: http://www.imf.org/en/News/Seminars/Conferences/2018/03/08/evaluating-tax-reforms. We are also in the process of developing a dedicated, user-friendly web portal which will feature a search engine to query the textual information contained in the database. The web portal is expected to be completed and go live in July, 2018. The content of the TPRD is protected by standard IMF (https://www.imf.org/external/terms.htm), OECD (http://www.oecd.org/termsandconditions/), and IBFD (https://www.ibfd.org/Copyright-IBFD-2018) copyrights. Users with a subscription to the IBFD can access additional information on the nature of documented tax policy changes through direct links to specific news items available from the IBFD Tax Portal (https://www.ibfd.org/IBFD-Tax-Portal).

Our database offers several distinct advantages. First, it allows for classifying the precise nature of discretionary tax policy measures across advanced and emerging countries, including in areas for which no time-varying policy indicators currently exist (e.g., changes in exemptions, tax thresholds, or capital gains taxation). In this regard, it is similar to the approaches used by Kawano and Slemrod (2016) to identify CIT rate and base changes, and by Vegh and Vuletin (2015) to document rate changes for PIT, CIT, and VAT. In contrast with these studies, we identify and document both rate and base changes across a range of taxes. Second, we identify the timing (i.e., announcement and implementation dates) of tax policy changes since the early 1970s. This, in turn, enables an assessment of the anticipation effects associated with tax policy changes, which have been found to be empirically relevant (see Mertens and Ravn, 2012, for the United States). Finally, our database complements the information available from "The Taxes in Europe" database of the European Commission (TEDB), which provides detailed information on the nature of tax measures (e.g., type of tax change, timing of tax change, and expected revenue impact) introduced in European Union member countries since 2012.[4] In contrast, the TPRD covers a longer time horizon, and contains detailed information for a more diverse group of advanced and emerging market economies.[5]

Our database lends itself to numerous new applications of relevance to researchers and policymakers alike. For example, our database could help shed light on whether the observed decline in standard tax rates conceals base broadening measures or was accompanied by changes in other tax rates (e.g., whether the historical downward trend in CIT rates across countries has been accompanied by base broadening measures). Similarly, it could help examine the (dynamic) macroeconomic effects of tax policy packages, including their composition and potential synergies across different reforms. The information contained in the TPRD can also help advance knowledge on the economic effects of tax policy measures with significantly different implementation lags—the difference between implementation and announcement dates, and on the political economy of these reforms. Finally, it could help in identifying case studies for specific tax policy changes (e.g., changes in VAT or PIT thresholds) which policymakers may be contemplating.

At the same time, the TPRD should be seen as work in progress since the quality of the information gathered varies across countries, time periods, and types of tax measures. In this regard, PIT, CIT, and VAT measures introduced between 1988-2014 offer the most comprehensive coverage in terms of information available in the database. Moreover, our database does not attempt to measure and compile policy settings across countries. Also, it does not aim at providing an exhaustive accounting of all tax policy measures introduced by a country

[4] The TPRD also appears to complement the European System of Central Banks (ESCB) dataset on tax reforms, which contains information on the estimated cost of different tax measures. Access to the ESCB dataset is currently restricted. The ESCB approach is described in Kremer and others (2006).

[5] The TEDB is available at https://ec.europa.eu/info/business-economy-euro/indicators-statistics/economic-databases/taxation-reforms-database_en.

over the sample period. Going forward, users could further improve and expand the database, including by extending its country and time coverage, adding details on tax measures included in the database or currently excluded from it, and closing information gaps.

The level of detail contained in the TPRD complements the existing literature which has compiled information on fiscal policy actions using different approaches. This paper is closely related to studies that have used the narrative approach to estimate the economic impact of exogenous changes in fiscal policy. This approach consists of gathering information about the size, timing, and motivation of policy interventions from narrative documents, such as legislative documents, news articles, and presidential speeches (see, for example, Ramey and Shapiro, 1998; Romer and Romer, 2010; Ramey and Zubiary, 2015).[6] Relatedly, a number of papers have used a "natural experiment" approach for identifying and measuring fiscal policy actions and examining their short-term macroeconomic cyclical impacts (see, for example, Ramey, 2011; Strawcynski, 2013; Auerbach and Gorodnichenko, 2012; Riera-Crichton et al., 2015). For instance, Riera-Crichton et al., (2015) build a value-added tax rate database at a quarterly frequency to estimate tax multipliers for a large sample of advanced economies. However, most studies focus on a single country, typically the US, and do not decompose exogenous tax policy changes between rate and base effects for different taxes. To check for accuracy, we compared our database to other databases constructed using a narrative approach for individual countries.[7]

This paper presents two sets of stylized facts which could be explored further in future research. The first is relevant for empirical analyses on the effects of tax policy. Namely, we find that the majority of tax policy measures introduced in the sample affect the tax base rather than tax rates, and are part of broader tax policy reform packages. These two aspects of tax policy changes have been neglected in the literature. The second set of stylized facts matters for understanding the drivers of tax policy. Specifically, we examine regularities in the timing of announcements of tax policy changes and find that tax increases occur relatively more frequently in periods of economic recessions and post-election years than in expansions and in the run-up to elections, respectively. We also find that in episodes of fiscal consolidation, tax increases are often offset by tax decreases, suggesting that policymakers attenuate the distortionary and/or distributional effects of higher taxes. These results are subject to significant heterogeneity across countries and tax types, which we likewise document.

The remainder of the paper is organized as follows. Section 2 describes how the database is constructed. Section 3 presents stylized facts on various characteristics of tax policy measures, while Section 4 explores the aspects related to their timing. Section 5 concludes.

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[6] An advantage of this approach is that identified fiscal policy actions are exogenous to the state of the business cycle. As this line of literature identifies unanticipated shocks, it also addresses the "fiscal foresight" problem pointed out by Leeper, Walker, and Yang (2013). However, most studies focus on a single country, typically the U.S., and do not decompose exogenous tax policy changes between rate and base effects for different taxes.

[7] The countries for which we compared the data in the database with available narrative datasets are United States, United Kingdom, Spain, and Portugal. For more information on the dataset used see Appendix D.

II. DATABASE CONSTRUCTION

A. Sources of Information

The information on tax policy measures was obtained by examining documented policy actions reported in 953 OECD Economic Surveys for 23 advanced and emerging economies over the last four decades.[8,9] The advantage of using OECD Surveys as main source of information over other types of publications, such as IMF country reports or private company's country analysis, is that these reports provide the most comprehensive assessment and documentation of a country's main tax policy changes across all tax types we considered.

Data on tax policy measures was further supplemented with information on announcement and implementation dates. For the period 1988-2014, this information is primarily obtained from tax-related news contained in the archives of the IBFD.[10] IBFD news are compiled by tax experts and provide very detailed information on the nature and exact timing of announcement and implementation (i.e., day, month, and year) of tax policy changes in a large number of countries from 1988. For the period preceding 1988, this information is primarily extracted from the so-called OECD *"Calendar"* or *"Chronology"* of main economic events, which had been a standard annex of OECD Surveys until 2003-2005. Compared to the IBFD, OECD calendars typically provide less detail on the timing of tax changes (i.e., the day of implementation/announcement is often unavailable). As a result, the precision in dating measures before 1988 is lower than in the case of measures adopted after 1988. When information on the timing of tax changes is not found in IBFD or OECD calendars, it is retrieved by assessing the information available in the textual fragments of the OECD Surveys, which typically allows one to identify announcement and implementation years.

The information on identified tax measures was cross-checked against available external indicators to ensure accuracy and detect possible information gaps. Specifically, identified rate changes for PIT, CIT, and VAT were confirmed by comparing the relevant information from the OECD Surveys with quantitative data available from the IMF tax rate database (1980-2014); the European Commission tax indicator database (1995-2015); the Global KPMG tax rates database

[8] The countries covered in the database include Australia, Austria, Brazil, Canada, China, Czech Republic, Denmark, France, Greece, Germany, India, Ireland, Italy, Japan, Korea, Luxembourg, Mexico, Poland, Portugal, Spain, Turkey, United Kingdom, and the United States. See Appendix A for further details on the selection criteria used for each tax type.

[9] OECD Country Surveys are available at http://www.oecd-ilibrary.org/economics/oecd-economic-surveys_16097513 and covered by standard copyrights.

[10] In the current version of the database we report exact announcement and implementation dates (i.e., day, month, year) for most PIT, CIT and VAT measures announced starting from 1988. We are currently in the process of documenting precise information on the timing of SSC, EXE, and PRO for the period 1988-2014, which will feature in the next version of the database.

(2006-2015), and USAID collecting taxes database (2007-2012). For PIT, CIT, and VAT base measures that were dated with IBFD news, the checks involved comparing the relevant information from the OECD Surveys with the detailed information available from the IBFD archives. Information for some countries was also checked against well-established databases that were constructed using a narrative approach. Cross-checks for SSC, EXE, and PRO taxes are currently ongoing and any potential revision in the coding and/or timing of these measures will be reflected in the next version of the database. It should be noted, however, that while these checks help improving the quality of the database, they do not rule out the risk of finding inconsistencies and/or omissions in the database.

China and India represent two special cases because only a handful number of OECD Surveys is available for these countries.[11] To increase the coverage of tax policy changes in these countries, the information from the Surveys was integrated with hand-picked information from alternative sources, such as IMF internal documents, IBFD archives, and national sources. This allowed to us to significantly expand the coverage of tax policy measures for these countries.

B. Steps Involved

The construction of the TPRD involved several steps (Figure 1 and Appendix A). A first step encompassed processing information contained in the 953 OECD Surveys and 37, 943 IBFD news clips with the view to identify excerpts of these documents that describe changes in any of the six taxes considered (i.e., PIT, CIT, VAT, SSC, EXE, and PRO). This was done by defining a system of text-based rules to extract fragments of text from unstructured documents such as the OECD Surveys.[12] Such a system of rules represents a fairly flexible apparatus, a "tax vocabulary" of sorts, that codifies how policy changes in any of the six taxes under consideration are typically described in OECD Surveys (i.e., which terms are used to discuss a tax change and how these terms interact with each other).[13]

The second step required assessing by hand which of the excerpts of OECD Surveys among the ones identified in the previous step, constituted an actual policy change for any of the six taxes under consideration. The validated policy changes were then classified along several different dimensions, including the type of tax (e.g., CIT, VAT); the type of change (i.e., rules governing the tax base and tax rates), the direction of the change (i.e., increase, decrease); whether the measure represented a major tax change (or "reform"); if the measure was announced as part of a package; whether the measure was phased over several years; and if the measure was introduced in a consolidation year (see Section C for details).

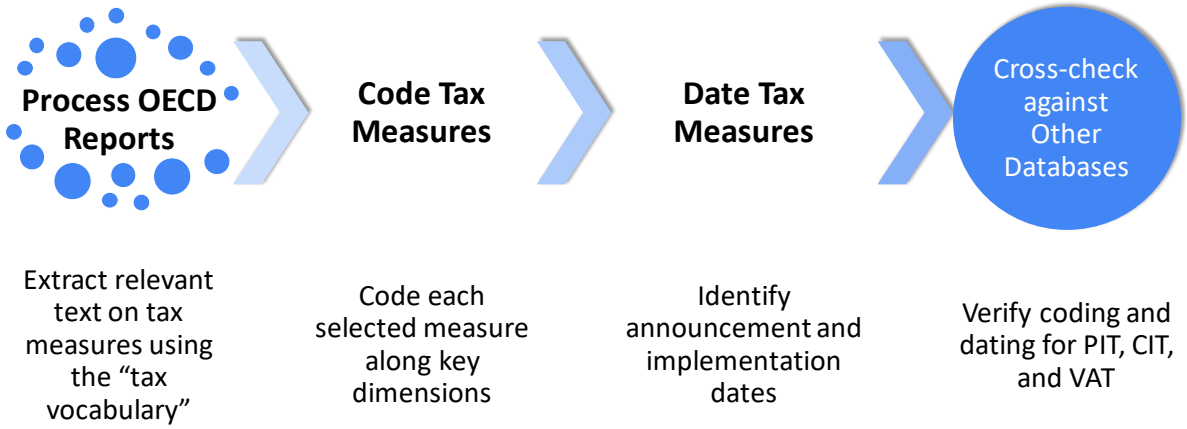
[11] The limited availability of OECD Surveys for China and India mainly reflect the fact that these two countries are not regular OECD members and gained the status of partner countries only in May 2007.

[12] We used the text mining software Provalis Prosuit® to perform this task.

[13] See Appendix C for a detailed description of the tax vocabulary.

In a third step, announcement and implementation dates of each classified measure were documented using the information available from IBFD archives and OECD's calendars, or from the excerpts themselves if information from IBFD and OECD was unavailable.[14] A fourth and final step consisted of checking the accuracy of the information on PIT, CIT, and VAT measures in the database against quantitative information on rate changes and qualitative information on base changes available from alternative data sources (see Appendix A. and Appendix E). These checks provided confidence on the accuracy of the information contained in the database, and also helped in identifying and documenting information gaps. Such gaps are part of ongoing analysis and will be addressed in the next version of the database.

Figure 1. Steps to Develop the Tax Policy Reform Database



C. Identifying Tax Policy Measures

The nature of tax measures selected from the OECD Surveys is fairly heterogenous. In particular, identified tax measures span important reforms (e.g., the introduction of VAT in France; the overhaul of PIT taxation in Italy and Poland; and the reform of CIT taxation in Ireland) as well as minor measures related to small changes in tax rates, or the adoption of tax expenditures for specific products or taxpayers. Documented tax measures were, therefore, further differentiated between major tax changes with potentially large macro-fiscal implications (e.g., tax reforms) and those measures with potentially more limited economic effects. This was done by fixing a threshold for rate changes, and relying on informed judgement for base changes using all

[14] In the current version of the database, CIT, PIT and VAT measures in 1988-2014 typically feature exact announcement and implementation dates (i.e., day, month, year) based on IBFD information, while CIT, PIT, and VAT measures prior to 1988 generally displayed less precise announcement and implementation dates (i.e., month, year) based on OECD calendars. In the case of SSC, EXE, and PRO measures, the current version of the database, reports announcement and implementation dates typically based on information available from the OECD calendars or the excerpts themselves, hence less precise than the information available from IBFD archives. See Appendix B for more information.

available information from the OECD Surveys, IBFD archives, as well as analytical studies (see below and Appendix E). For each tax category, we recorded the direction of change (i.e., increase or decrease). Table 1 provides specific examples of different types of base and rate changes contained in the database.

For tax rate changes, a rate change larger than 1 percentage point in absolute value was considered a major reform.[15] While arbitrary, this threshold appears to strike a reasonable balance between accuracy (i.e., small rate changes may have significant fiscal implications if applied to a large base) and parsimony (i.e., to keep the number of major tax changes to a manageable level). In the case of excise taxes (per unit), the determination of whether a tax change is major is based on an assessment of the language used in the OECD report.

For base changes, a major tax reform is identified when the change in the tax base (e.g., a broadening or a reduction of the tax net) affects a large group of taxpayers or has the potential to mobilize significant resources. Based on the description of tax policy changes contained in the OECD Surveys and IBFD news stories, we coded a change that broadens the tax base system (defined as increasing tax revenue holding constant the statutory tax rate, other tax base aspects and the behavior of economic agents) as an "increase" while a change that reduces the tax base is denoted as a "decrease". Detailed information on specific tax base changes and description of the precise legislative and regulatory actions that underpin observed large changes is captured in the database in text format.

A number of conventions were followed in classifying different tax changes. The introduction/removal of a tax was coded as a base measure and so were changes in income brackets (unless specified otherwise). A reduction in the number of tax brackets was coded as a base broadening measure following the assumption that simplification can boost compliance. The extension or postponement of a tax measure (e.g., a temporary surcharge is maintained for an additional year, the reduction in PIT rate is delayed) were coded as an actual tax change aimed at avoiding the effects of the planned tax change. Accordingly, for example, the postponement of a rate reduction was coded as a rate increase because absent such a postponement, the rate would have been lower.

In general, major tax base changes were identified in different ways depending on the type of tax:

[15] We are currently classifying the PIT, CIT, and VAT rate changes cording to several categories to distinguish changes in statutory rates from other types of rate changes. The categories considered for PIT are the following: 1) Statutory rates, 2) Top rate, 3) Bottom rate, 4) Surcharges, 5) Capital gains, 6) Dividends, 7) Other. The categories for CIT are: 1) Statutory rates, 2) Top rate, 3) Surcharges, 4) Capital gains, 5) Dividends, 6) Other. The categories for VAT are: 1) Standard rate, 2) Reduced rates, 3) Other. This information will be included in the next version of the TRPD.

- A CIT base change pertains to any of the following categories: R&D promotion (e.g., tax credit), investment promotion (e.g., depreciation rules), loss-carry rules, thin capitalization, and capital gains. If a base change does not fall into any of these categories (e.g., generic exemptions), it is classified as belonging to "other base changes". Other base changes are considered as "major" only if the information from the information from the OECD Survey or IBFD archives suggest that such changes constitute a significant reform.[16] These categories are broadly consistent with the ones used in Kawano and Slemrod (2016).

- A PIT base change pertains any of the following categories: standard relief (e.g., single person or family deductions, tax credits); child relief (e.g., tax credit, deductions); relief on capital gains; interest relief; and relief for SSC, insurance premiums, and private pensions. Base change not falling into any of these categories (e.g., deductions for special purposes) are classified as "other base changes", which may or may not be considered as major depending on the information available from OECD Surveys and IBFD archives. These categories are broadly consistent with the analysis in OECD (2006 and 2016b).

- A VAT base change pertains any of the following categories: exemptions on food items, exemptions on medical supplies, and exemptions on education. All other VAT base changes (e.g., introduction of VAT, generic exemptions) are classified as "other base changes". Other base changes are considered as major only if the information available from OECD Surveys and IBFD archives corroborates such a conclusion. These categories are broadly consistent with the analysis in OECD (2016a) and IMF (forthcoming).

- A base change in SSC, EXE, or PRO is "major" when available information from OECD Surveys and/or IBFD archives suggests that such a change affects large groups of taxpayers or could potentially mobilize significant resources. This criterion is arbitrary and reflects the lack of consensus in the literature on what constitutes a major SSC, EXE, or PRO base change.

The current definition of major tax measure does not imply any loss of information on tax changes, given that the database contains all the underlying tax excerpts. This allows other users and researchers to customize their definition of major change. In this regard, the database represents a unique source of information and lends itself to multiple uses, including by allowing users to generate new databases that better fit their research question.

The information on the type of tax measures was supplemented with additional documentation on the identified measures. A dummy variable (taking the value of 1, and zero otherwise) identifies whether the coded measure is part of a package, if this is explicitly mentioned in the

[16] For example, the OECD Survey or the IBFD archives often use strong normative language to define the action, such as "important reform", "the change affects many households/companies", or "the change has a significant revenue impact". Another criterion used is if the policy measure is mentioned repeatedly across different issues of the OECD Survey or mentioned in the retrospective summaries of key past reforms.

OECD report or if the measures share the same announcement date. Similarly, we identify whether the measure was phased over several years (i.e., multiyear).[17] Finally, for tax measures announced during a consolidation period, as defined in Alesina and others (2017), the TPRD provides information on the expected revenue yield of each measure as reported in Dabla-Norris and Lima (forthcoming). This was done by associating, when possible, consolidation measures and related expected revenue yields with the corresponding measures in the tax measures database (see Appendix B for more details).

While the TPRD holds promise to become an important tool for tax policy analysis, important caveats apply. First, the approach does not rely on a common single metric to identify tax base changes, unlike some earlier studies that relied on changes in tax rates. While we use transparent criteria to identify base changes, there is more judgement involved as to whether a given measure constitutes a major base change. Second, the database provides no information regarding the stance of current (or past) tax policy or tax structure. Third, tax changes, other than in consolidation episodes, are identified as a binary dummy as opposed to continuous variables, which does not allow to measure the size of the change. Moreover, in contrast to consolidation episodes, the exact motivation underlying the tax change is not identified. Importantly, the TPRD is preliminary and should be viewed as work in progress. The quality and the accuracy of tax policy information varies across tax types, countries, and over time, with more detail available for recent decades.

[17] Information on the phasing of tax policy measures is important because policy changes may be explicitly sequenced over several years and adjusted during the course of their implementation. These types of measures may have intrinsically different characteristics from measures that are introduced within a single year and generate a complex interaction of expected and unexpected policy actions, which should be accounted for (Alesina and others, 2015, 2017). These measures may also be more likely to be part of comprehensive and profound efforts to reform the tax system.

Table 1. Examples of Different Rate and Base Changes by Type of Tax

Country	OECD excerpt	Tax	Type of change	Dir. of change	Major Change	Package	Announcement	Implementation
DNK	A tax credit for r&d activities of some enterprises has been proposed in the fiscal bill for 2012	CIT	BASE	DEC	1	1	8/24/2011	1/1/2012
FRA	Corporate income tax reductions for small business, the suppression of the part of the "professional tax" applied to salaries and reductions in social security charges	CIT	BASE	DEC	0	1	8/31/2000	5/31/2001
CHN	Withholding tax on dividends cut from 5% to zero	CIT	RATE	DEC	1	1	12/25/2006	1/1/2008
LUX	An increase in the solidarity levy on corporate income tax (impôt sur le revenue des collectivités)	CIT	RATE	INC	0	1	5/2/2006	1/1/2007
MEX	The tax reform approved in 2013 included the introduction of taxes on high-caloric foods and sweetened beverages.	EXE	BASE	INC	1	0	x/x/2013	x/x/2013
FRA	This measure will apply to firms that have signed agreements on the 35-hour week, and will be financed by a tax on energy consumption, to be brought in in 2001, and a contribution out of the profits of companies with turnover in excess of ff 50 million	EXE	BASE	INC	0	0	5/x/1999	x/x/2001
TUR	Petroleum consumption tax rate is increased from 26 to 31.5 per cent.	EXE	RATE	INC	1	0	x/x/1990	x/x/1990
GER	The increase in the tobacco tax came into effect	EXE	RATE	INC	0	0	6/x/1982	x/x/1982
GRC	The tax reform in 2008 included further cuts in personal income taxes, reducing the two middle marginal rates of 29% and 39% by four percentage points between 2007 and 2009, to 25% and 35% respectively, and measures to broaden the tax base, such as the imposition of a 10% tax rate on dividends and capital gains.	PIT	BASE	INC	1	1	8/28/2008	1/1/2009
ESP	The proposed tax reform has a number of measures to broaden the tax base, such as the elimination of dividends exemptions and limits to severance payments exemptions.	PIT	BASE	INC	0	1	3/29/2012	7/14/2012
POL	Under the plan, the first bracket rate will be lowered from 19% to 18% and the two higher rates will be replaced by a single rate of 32%.	PIT	RATE	DEC	1	1	5/18/2006	1/1/2009
JPN	Finally, capital gains taxes on transfer of land for corporations and individuals were lowered (pg 281, 1999)	PIT	RATE	DEC	0	1	8/7/1998	1/1/1998
JPN	The inheritance tax was reduced by a combination of rate cutting (the marginal rate was lowered from 75 per cent to the current level of 70 per cent) and base narrowing	PRO	BASE	DEC	1	1	12/24/1988	x/x/1988
GBR	In the 2007 budget the government announced steps to reform tax exemptions on vacant and unused commercial land by shortening the exemption period and by applying the shortened exemption period more uniformly across different types of properties	PRO	BASE	INC	0	0	x/x/2007	x/x/2007
CZE	Tax on real estate property transfer has been reduced from 5 per cent to 3 per cent	PRO	RATE	DEC	1	1	6/x/2003	x/x/2003
KOR	Tax rates on land will also be reduced	PRO	RATE	DEC	0	1	9/x/2008	x/x/2008
GER	The rate of social security contributions payable by employers for employees on shorttime work was halved during the first 6 months of short-time work and waived altogether provided the employees participate in training programmes (eur 2,3 billion in 2009 and 2010)	SSC	BASE	DEC	1	1	1/14/2009	1/1/2009
FRA	The legal workweek remains at 35 hours, but, with the tepa law of august 2007, exemptions from social contributions and income tax have been granted for overtime hours; this is costly to the treasury and runs the risk of fraud	SSC	BASE	DEC	0	1	6/20/2007	10/1/2007
GBR	Announcement that national insurance contributions from employees in 1981-82 to be raised from 6 ¾ to 7 ¾ per cent (3/4 per cent to pay for increased unemployment, 1/4 per cent to help preserve expenditure on national health scheme, ½ per cent to restore balance between expenditure on social security benefits financed by contributors and by general tax-payer)	SSC	RATE	INC	1	0	11/24/1980	11/24/1980
USA	The social security tax rate was increased from 11,7 per cent to 12,1 per cent, the taxable earnings base was increased from $16 500 to $17000	SSC	RATE	INC	0	0	x/x/1977	1/x/1978
AUS	The WST (wholesale sales tax) – introduced in 1930 (pg 89, 1999)	VAT	BASE	INC	1	0	x/x/1930	x/x/1930
POL	The mandatory registration threshold for the vat is lowered and various service activities are brought into the vat base.	VAT	BASE	INC	0	1	3/2/1994	1/1/1994
ITA	VAT rates on property transfers reduced to 2 per cent, and other transaction costs reduced (for sales before 31st december 1983)	VAT	RATE	DEC	1	1	4/23/1982	x/x/1982
IRL	An income levy was introduced and new taxes imposed on items such as second homes, airline passengers and car parking.1 the vat rate was increased by 0.5 percentage points.	VAT	RATE	INC	0	1	10/14/2008	12/1/2008

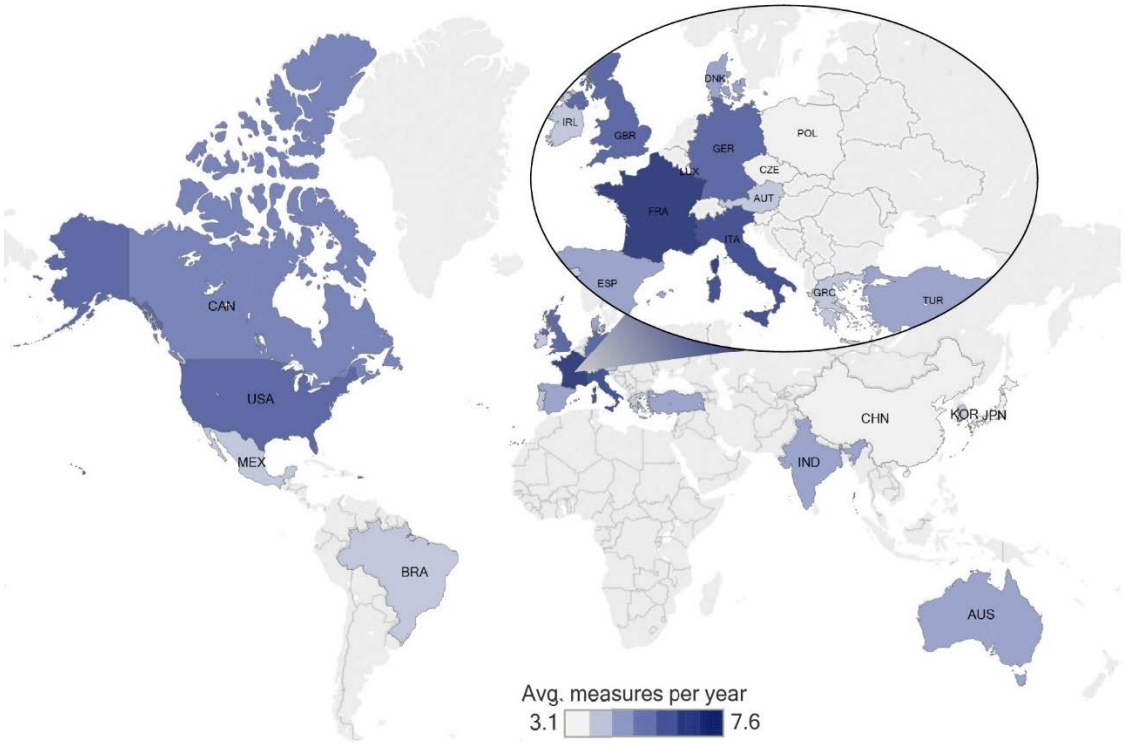
Source: IMF, OECD, IBFD.

Note: The announcement and implementation dates include an "x" when information on the day or month is not available. For example, if only the month and year of a measure is known, the announcement or implementation dates will look like 4/x/1989.

III. STYLIZED FACTS[18]

The database documents 3,285 tax policy measures, equivalent to an average of 5 tax measures per country year. Aggregate figures, however, masks significant cross-country heterogeneity (Figure 2 and Table Appendix E.1). In emerging market economies (Brazil, China, Mexico, and Poland), the database only captures an average of 3 to 4 tax measures per year. For advanced economies, such as France, United Kingdom, Germany, United States, and Italy, the average number of measures exceeds 6 per year.

Figure 2. Average Number of Tax Measures by Country



Source: Tax Policy Reform Database, OECD, IBFD.

Table 2 reports different characteristics of the tax measures in the database. Most measures entailed a change in the tax base (about 60 percent of the total identified measures); ⅔ of these changes implied a decrease in tax liabilities. By contrast, the composition of rate changes between increases and decreases appear to be much more balanced, with rate increases accounting for almost half of identified rate changes. Table 2 also indicates that more than 70 percent of all identified tax measures involved "major" tax changes or reforms in a single year, with a majority of these introduced as a package of tax measures. Among major reforms, a decrease in the tax base introduced as part of a policy package in a single year was most common (accounting for a 20 percent of all identified tax measures), followed by a base increase

[18] This section is based on version 1.1 of the TPRD.

(12 percent of total identified measures). Major rate decreases introduced as part of a package in a single year represent 10 percent of total identified measures.[19]

Table 2. Frequency Distribution of Tax Policy Changes in the Database

(in percent of total identified measures)

		Major							Minor							Grand Total
		Base			Rate			Total	Base			Rate			Total	
		Dec	Inc	Total	Dec	Inc	Total		Dec	Inc	Total	Dec	Inc	Total		
Single-year	Not in package	7.6	4.8	12.4	4.1	4.2	8.2	20.6	1.8	0.8	2.6	1.6	2.4	4.1	6.6	27.2
	Package	19.8	11.6	31.3	10.1	9.0	19.1	50.5	2.5	1.9	4.4	2.3	3.1	5.5	9.8	60.3
	Total	27.3	16.3	43.7	14.2	13.2	27.4	71.1	4.3	2.6	6.9	4.0	5.6	9.6	16.5	87.5
Multi-year	Not in package	0.9	0.1	1.0	0.8	0.6	1.4	2.4	0.2	0.0	0.2	0.1	0.2	0.3	0.5	2.9
	Package	2.8	1.7	4.5	3.3	0.6	4.0	8.5	0.5	0.2	0.7	0.2	0.2	0.4	1.1	9.6
	Total	3.7	1.8	5.5	4.2	1.2	5.4	10.9	0.7	0.2	0.9	0.3	0.4	0.6	1.6	12.5
Grand Total		31.0	18.2	49.2	18.4	14.4	32.8	81.9	5.0	2.9	7.9	4.3	5.9	10.2	18.1	100.0

Source: Tax Policy Reform Database, OECD, IBFD

Because multiple tax measures can occur in the same year, it is important to also examine the distribution of tax policy changes in terms of country-year occurrences. This allows to gain a better understanding of how frequent tax changes are in terms of sample years.[20] Table 3 describes the basic feature of the database in country year occurrences and average number of measures per country years. Base measures occurred more often than rate measures in the whole sample (575 versus 520 country years out of 672 country years). In addition, base decreases outnumbered base increases, while rate increases were more frequent in the case of minor measures (132 versus 101 country years) and measures that were not announced as part of a tax package (183 versus 167 country years).

Table 3. Distribution of Tax Policy Changes in the Database

(count of country years)

	Base			Rate			All changes		
	Decrease	Increase	All changes	Decrease	Increase	All changes	Country year	Count of measures	Average per country year
All sample	461	339	575	363	331	520	672	3,285	4.9
Major	437	305	547	316	262	461	640	2,692	4.2
Minor	110	75	161	101	132	192	271	593	2.2
Package	332	242	408	255	214	358	458	2,295	5
No Package	231	143	320	167	183	304	477	990	2.1
Single year	439	325	553	319	308	480	646	2,876	4.5
Multiyear	87	45	118	98	47	135	205	409	2

Source: Tax Policy Reform Database, OECD, IBFD

Table 4 presents the co-occurrence of tax base and rate changes as well as increases and decreases in tax liabilities expressed in country years. In the sample, changes to the tax rate are more frequent when the tax base also changes (423 country years out of 520 country years in

[19] For information on the frequency distribution of tax measures by tax type see Table Appendix E.2. For information on the correlation among different tax policy changes see Table Appendix E.3. For information on the co-occurrences of different tax policy changes see Table Appendix E.4.

[20] Here, years stand for years in which a tax measure is announced.

which there a rate change)[21] than in cases where the tax base does not change (97 country years out of 520).[22] Furthermore, Table 4 shows that decreases in tax liabilities occur more frequently when there are also increases in tax liabilities than in cases where tax liabilities are not increased. These results are consistent with the conclusions reached by Kawano and Slemrod (2016) for the relationship between CIT base and rate changes. By extending the analysis to more types of taxes, our results confirm that ignoring the effects of base changes could potentially bias the estimated economic effect of rate changes and provide a narrower perspective on the various dimensions involved with tax policy reforms. This fact also illustrates well the potential advantages of using our more comprehensive database of occurrences of changes in multiple aspects of tax bases for different tax types.

Table 4. Tax Policy Measures by Type and Direction of Change

(count of country years)

	Rate				
Base	Only Increase	Only Decrease	Inc. and Dec.	No Change	Total
Only Increase	32	21	21	40	114
Only Decrease	34	80	45	77	236
Inc. and Dec.	52	55	83	35	225
No Change	39	33	25	0	97
Total	157	189	174	152	672

	Decrease				
Increase	Only Base	Only Rate	Base and Rate	No Change	Total
Only Base	35	21	55	40	151
Only Rate	34	25	45	39	143
Base and Rate	52	21	83	32	188
No Change	77	33	80	0	190
Total	198	100	263	111	672

0 83

Source: Tax Policy Reform Database, OECD, IBFD.

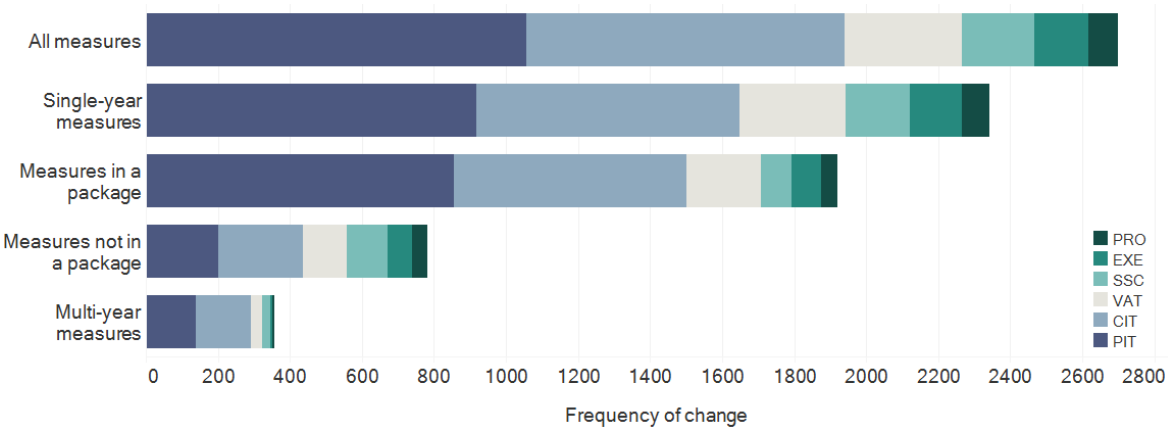
In the reminder of this section, we present additional stylized fact that focus on major tax measures (representing over 80 percent of observed tax policy changes or 95 percent of country years occurrences). Figure 3 presents the breakdown of major tax measures by tax type. Changes in the PIT, CIT, and VAT account for around 80 percent of total major tax changes for the entire sample. Changes in SSC are also quite frequent (7 percent of total major measures), while EXE and PRO measures occur less frequently in our database. This hierarchy across different tax types holds irrespective of whether the sample of major measures is restricted based on whether the tax changes are part of a tax package or multiyear in nature.

[21] The figure 423 country years is derived by summing up the values in the first three rows and columns of Table 4 for base and rate changes, while the figure 520 is given by adding up all values in the first four rows and columns of Table 4.

[22] The figure 97 country years is given by the sum of all values in the fourth row ("no change") of Table 4.

Figure 3. Frequency of Major Tax Reforms by Tax Type

(number of observed tax policy changes)

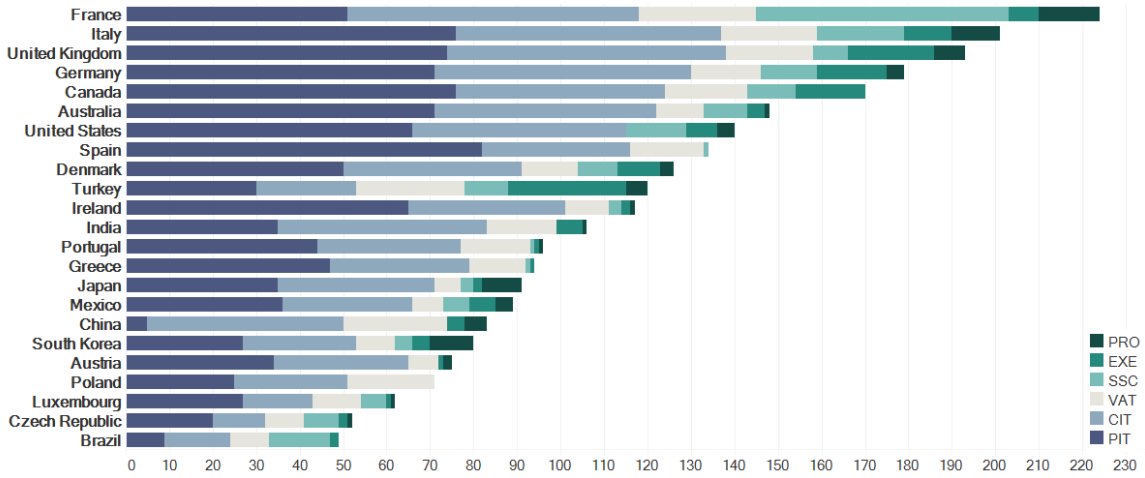


Source: Tax Policy Reform Database, OECD, IBFD.

Country-level information confirms the relative frequency of reforms tax type (Figure 4). Namely, the bulk of tax reforms is represented by changes to PIT, CIT, and VAT in all countries, except in France, Italy, and Brazil, where SSC measures were more common than changes in the VAT. PRO reforms represent a share of total tax changes above 6 percent in Japan, South Korea, France, China, and Italy; while, reforms to excises occurred more than in 8 percent of tax changes in Turkey, United Kingdom, Canada, Germany, and Denmark.

Figure 4. Frequency of Major Tax Reforms by Country and Tax Type

(number of observed tax policy changes)

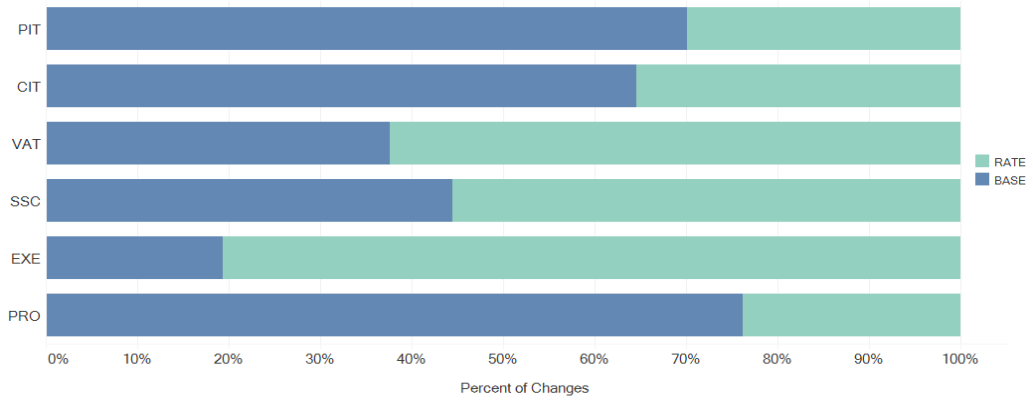


Source: Tax Policy Reform Database, OECD, IBFD.

Changes in the different taxes can be further decomposed into reforms related to changes in the rate or base for each tax instrument (Figure 5). Most PIT, CIT, and PRO measures comprise base changes, while rate changes were more salient in the case of VAT, SSC, and EXE reforms. In particular, about 2/3 of all PIT, CIT, and PRO consisted of base changes. This suggests that any

analysis assessing the economic impact of PIT and CIT rate changes without considering base changes is likely to suffer from significant biases.

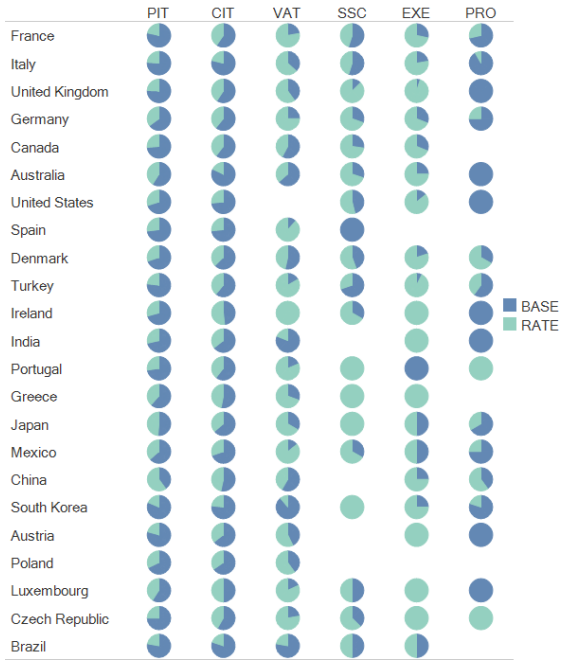
Figure 5. Composition of Major Tax Reforms by Tax Type and Type of Change



Source: Tax Policy Reform Database, OECD, IBFD.

Aggregate figures, however, mask significant cross-country heterogeneity. Figure 6 shows that in most countries major PIT, CIT, and PRO measures were dominated by base changes, with the exception of Japan and China for PIT; Ireland and Luxemburg for CIT; and China, Portugal, Denmark, and Czech Republic for PRO. At the same time, major VAT base changes outnumbered rate changes in approximately 1/3 of the sample. By contrast, major SSC and EXE measures were typically dominated by rate change, except for Spain, Italy, France, and Turkey for SSC; and Portugal for excises.

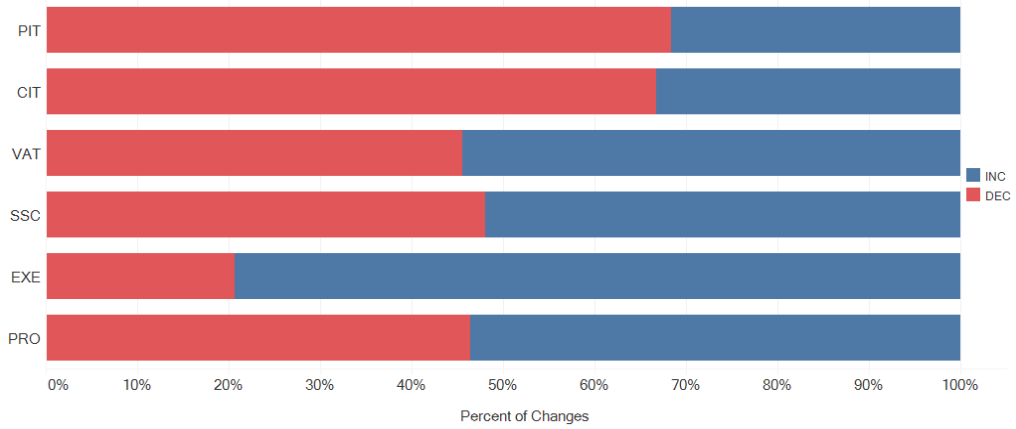
Figure 6. Composition of Major Tax Reforms by Tax Type, Type of Change, and Country



Source: Tax Policy Reform Database, OECD, IBFD.

Figure 7 provides the breakdown of major tax policy changes by tax and direction of change (i.e., increase or reduction in tax liability). A reduction in the tax liability was more common for major CIT and PIT reforms, while increases in tax liabilities were more pronounced for SSC, VAT, EXE, and PRO reforms. This result is broadly consistent with the gradual shift from direct taxation to indirect taxation observed in many advanced economies over the last decades (OECD, 2010). This does not necessarily imply that documented tax changes led to an increase or reduction in the tax burden expressed as the ratio of tax revenue-to-GDP.[23] Information on the size of rate changes from available databases suggests that, on average, CIT and PIT rates have declined, while VAT rates have increased (Box 1).

Figure 7: Composition of Major Tax Reforms by Tax Type and Direction of Change



Source: Tax Policy Reform Database, OECD, IBFD.

Our results do not seem to be driven by outliers (Figure 8). Namely, the frequency of major reductions in tax liabilities of the PIT and CIT is common across all countries in the sample, except for the case of Poland and Portugal for the PIT, and Austria and Greece for the CIT. SSC and PRO measures appear to be more evenly distributed between increases or decreases in tax liabilities. In these cases, however, some countries only saw increases or decreases in tax liabilities, and not both. For example, Spain, Japan, South Korea, and Greece only experienced increases in the tax liabilities related to SSC, while Portugal experienced only decreases. In the case of major PRO measures, the number of countries that introduced only one type of change (i.e., increase or decrease in tax liability) is significantly higher (e.g., in United States, Australia Turkey, Ireland, India, Portugal, Luxembourg, and Czech Republic).

[23] The TPRD does not provide information on the stance of current tax policy or tax structure nor on the size of individual tax measures.

Figure 8. Composition of Major Tax Reforms by Tax Type, Direction of Change, and Country

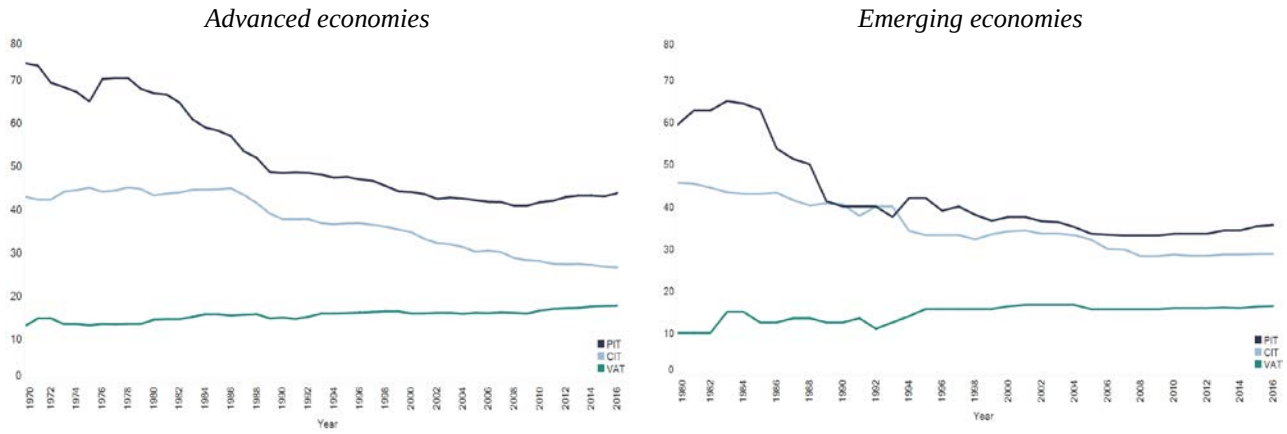
Source: Tax Policy Reform Database, OECD, IBFD.

Changes in direct taxation featured more prominently for measures that were announced as part of broader tax reform packages (Figure 9). Specifically, major PIT, CIT, and PRO changes accounted for about ¾ of all tax changes occurred within a package, while this proportion dropped to [60] percent in the case of tax measures outside a package. The relative importance of SSC measures increased when such measures were not announced in conjunction with a broad tax package.

Box 1. Developments in Tax Rates

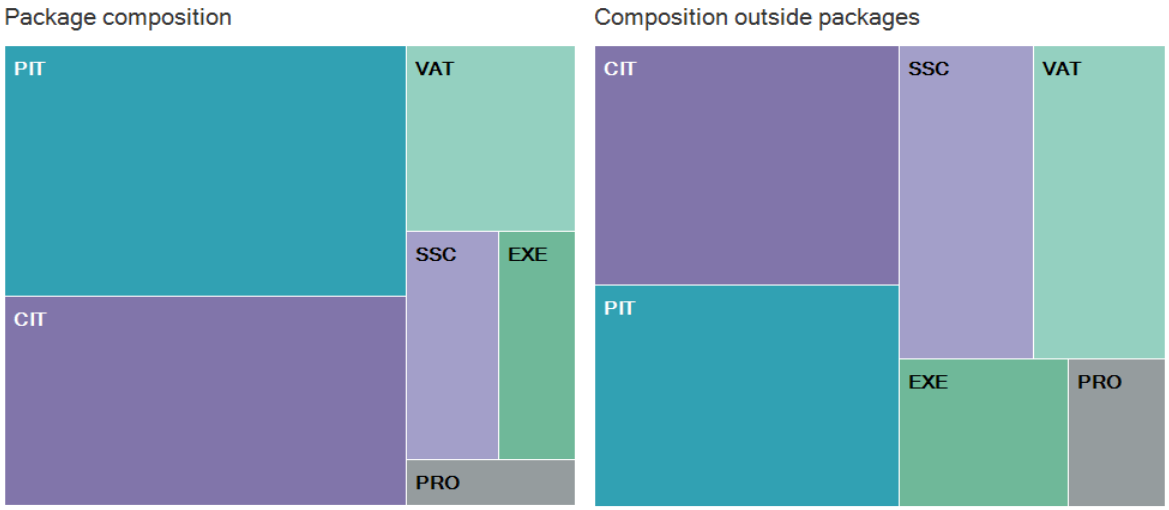
On average, CIT and PIT rates have been on a declining path in advanced and emerging market economies. Based on the recently developed database (Vegh and others, 2015), CIT rates in advanced economies (16 countries included in our database for which data was available) have on average declined from about 44 percent in 1970s to around 26 percent in 2017. In emerging market economies (6 countries included in our database for which data was available), CIT rates on average have declined from about 33 percent in 1980s to 22 percent in 2017. Similarly, PIT rates for advanced and emerging market economies for the same period have on average declined from nearly 70 percent and 60 percent to 44 and 36 percent, respectively. In contrast, VAT rates in both groups of countries increased. In particular, the average VAT rate increased for advanced and emerging market economies for the same period from 14 to 18 percent and from 13 to 16 percent, respectively.

Tax rate changes in advanced and emerging market economies (in percent)



Source: Vegh and others, 2015

Figure 9. Composition of Major Tax Reforms by Tax Type and Package



Source: Tax Policy Reform Database, OECD, IBFD.

The tax package announced in a typical year comprised about 4 tax measures, included both rate and base changes in approximately 60 percent of total country years (Table 5). Only in 11 percent of the cases were rate changes announced alone. This result confirms the fact that changes in the tax rates are typically announced in conjunction with base changes, often times of a different nature. Namely, 24 percent of total country years combined at least one measure to increase a tax rate with at least one base narrowing measure. Similarly, approximately 26 percent of total country years combined at least one measure to decrease a tax rate with at least a base broadening tax change.

Table 5. Major Tax Reforms in a Tax Package by Type and Direction of Change

in country years

Rate

Base	Only Increase	Only Decrease	Inc. and Dec.	No Change	Total
Only Increase	36	28	12	41	117
Only Decrease	22	95	16	89	222
Inc. and Dec.	23	40	23	48	134
No Change	43	34	20	0	97
Total	124	197	71	178	570

Decrease

Increase	Only Base	Only Rate	Base and Rate	No Change	Total
Only Base	48	28	40	41	157
Only Rate	22	20	16	43	101
Base and Rate	23	12	23	36	94
No Change	89	34	95	0	218
Total	182	94	174	120	570

average measures per country year

Rate

Base	Only Increase	Only Decrease	Inc. and Dec.	No Change	Total
Only Increase	2.6	2.8	3.3	0.9	2.1
Only Decrease	2.6	3.1	7.7	1.4	2.7
Inc. and Dec.	9.6	7.8	14.9	2.0	7.2
No Change	0.8	0.7	2.1		1.0
Total	3.3	3.6	7.7	1.5	3.4

Decrease

Increase	Only Base	Only Rate	Base and Rate	No Change	Total
Only Base	2.0	2.8	7.8	0.9	3.3
Only Rate	2.6	2.1	7.7	0.8	2.5
Base and Rate	9.6	3.3	14.9	2.6	7.4
No Change	1.4	0.7	3.1		2.1
Total	2.8	1.9	6.2	1.3	3.4

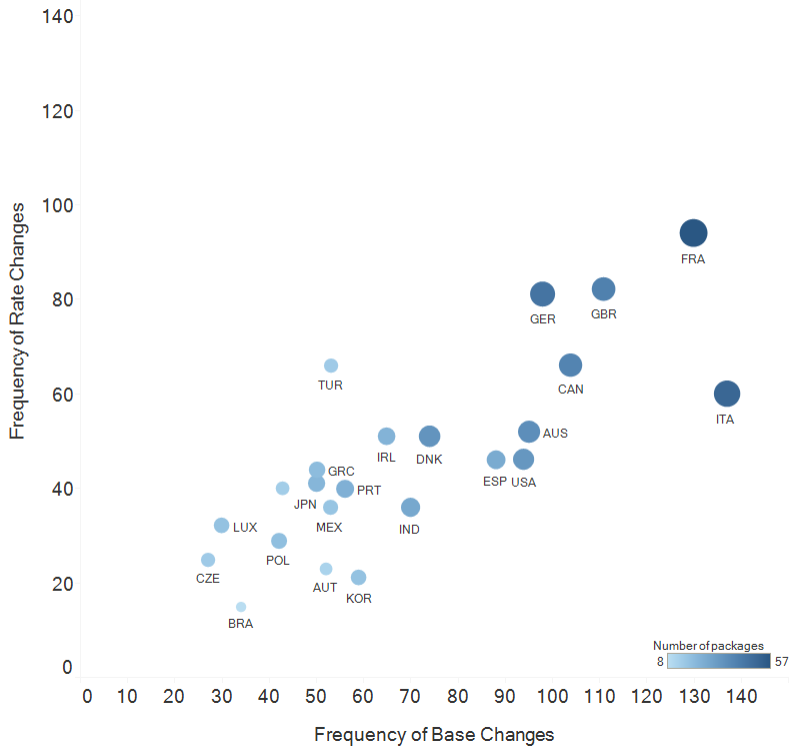
Source: Tax Policy Reform Database, OECD, IBFD

Countries, on average, announced less than a tax package per year or an average of about 25 tax packages over the entire sample period. However, this masks significant differences across countries. Namely, G7 countries with the exception of Japan announced significantly more tax packages (approximately between 35 and 45 packages over the sample period) which appeared to be broadly balanced in terms of number of tax rate and base changes (Figure 10).[24]

[24] The larger number of tax packages in G7 countries also reflects the fact that these countries have introduced more measures during the sample period and that coverage of OECD Surveys for G7 countries is more comprehensive both in terms of the timespan and details about tax policy measures.

Figure 10. Frequency of Major Tax Reform by Type of Tax Change, Country, and Number of Tax Packages

(The size of the bubble is given by the number of tax packages announced)



Source: Tax Policy Reform Database, OECD, IBFD.

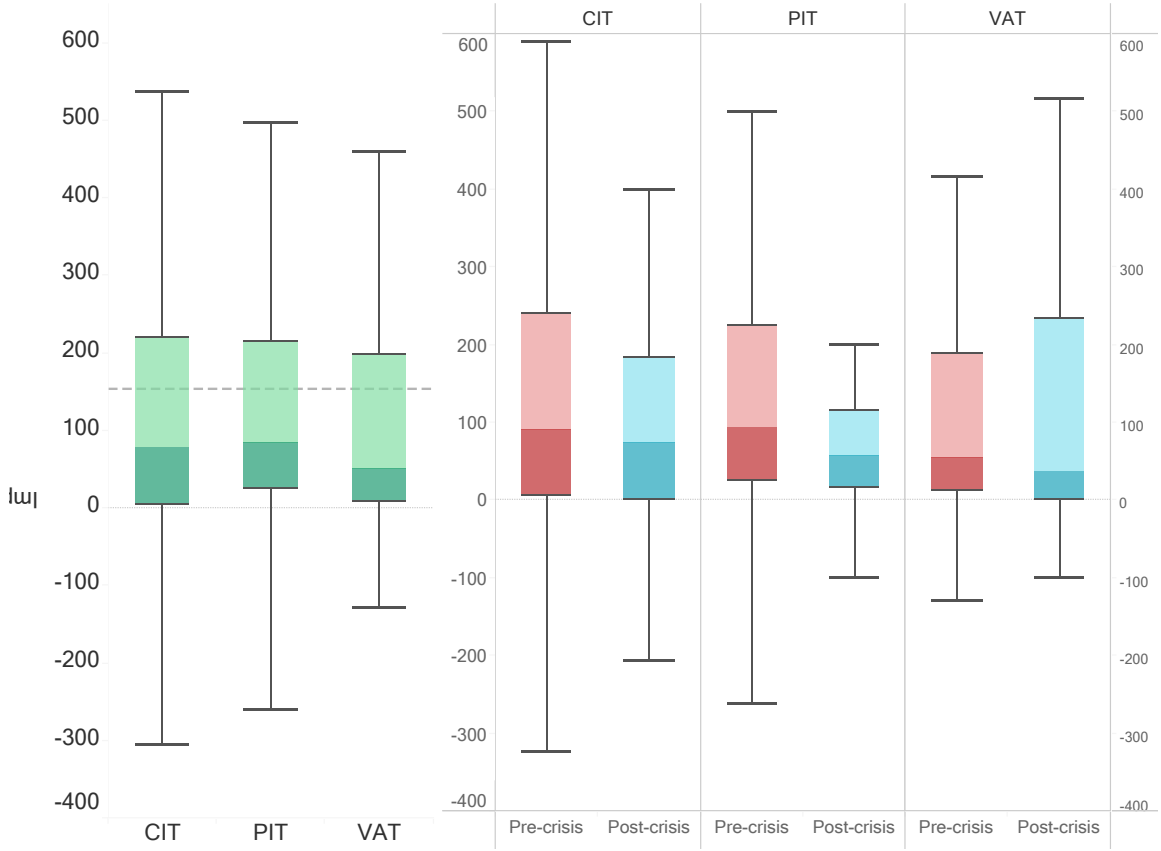
The database also provides information on the implementation lags for most tax measures included in the sample, particularly for the period 1988 to 2014.[25] Figure 11 shows that most major CIT, PIT, and VAT measures were implemented with sizable delays. The average and median implementation lag for these three taxes was 153 and 78 days, respectively. While the average implementation lag points to a rather long lead time for economic agents to adjust their behavior, there is significant variation across countries, tax types, and years. In particular, CIT measures featured a higher variation in implementation lags than PIT measures across countries, although both type of tax measures showed a similar median implementation lag. By contrast, the median implementation lags and cross-country variation are much lower for VAT measures.

It is important to note that the average implementation lag and variation also reflect the retroactive introduction of tax measures, which is captured by negative implementation lags (Figure 11). The median implementation lag and variation for PIT and CIT measures appears to have declined since the onset of the global financial crisis, with a less pronounced reduction for

[25] The implementation lag is measured in number of days and is given by the difference between the implementation date and the announcement day. A positive implementation lag typically reflects the legislative process that is required to convert a government's tax proposal into law. A negative implementation lag indicates that a measure has been implemented retroactively.

CIT than for PIT measures. This likely reflects the urgency of implementing various tax policy measures in response to the crisis. At the same time, the median implementation lag and variation of VAT measures across countries appears to have increased after the global financial crisis.

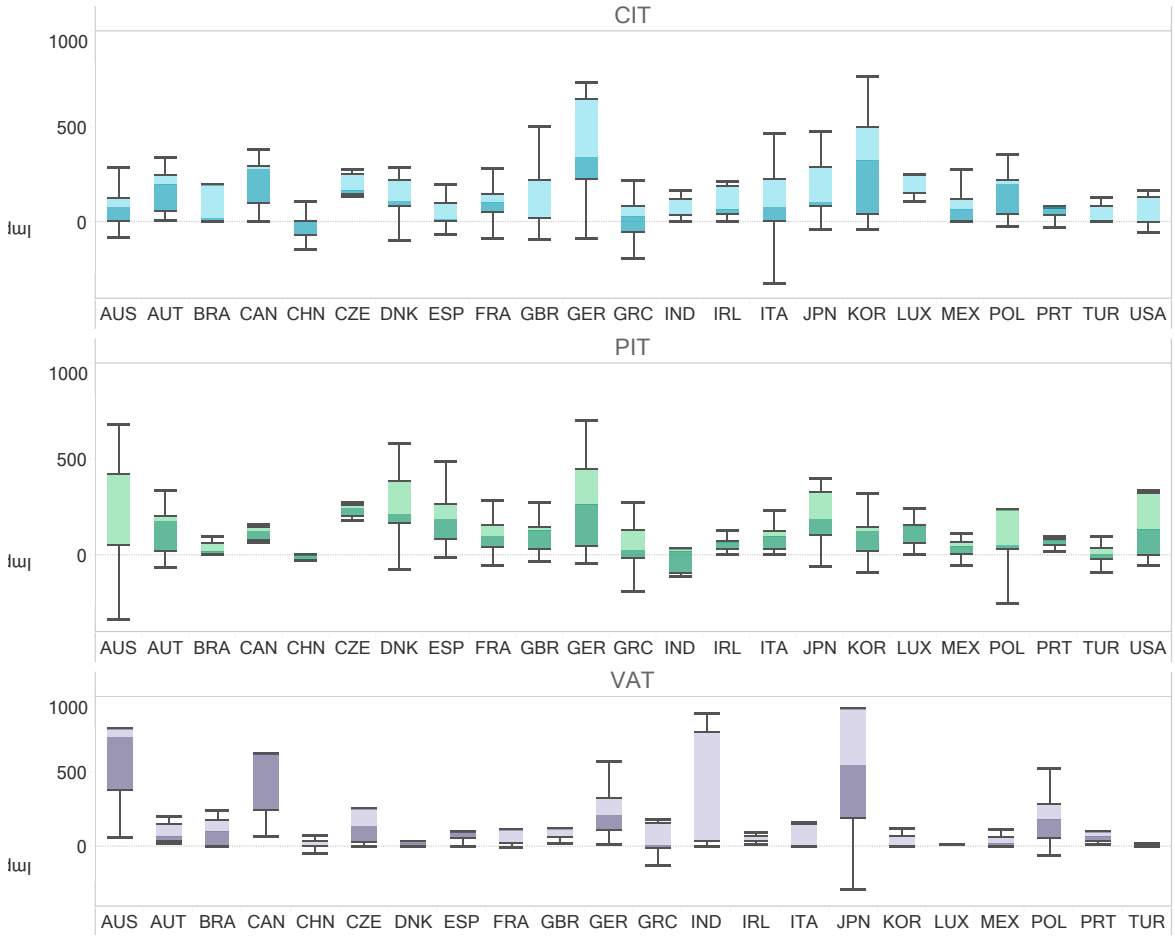
Figure 11: Aggregate Implementation Lags



Source: Tax Policy Reform Database, OECD, IBFD.

Figure 12 presents information on implementation lags by tax type and country. Some countries (e.g., China and Turkey), were particularly effective in implementing new PIT and CIT reforms with an average implementation lag below 40 days, while others (e.g., Czech Republic, Germany) faced longer implementation delays, possibly reflecting the introduction of broader tax reforms that required time for discussion among various stakeholders (e.g., public consultations for changes in the tax code), and/or faced a complex legislative process. Figure 12 also suggests that the dispersion of implementation lags varies significantly across countries. Indeed, Australia, Germany, and Japan showed higher dispersion consistently across different tax types, while Japan, India, and Australia showed a significantly high variation in the implementation lags for the VAT.

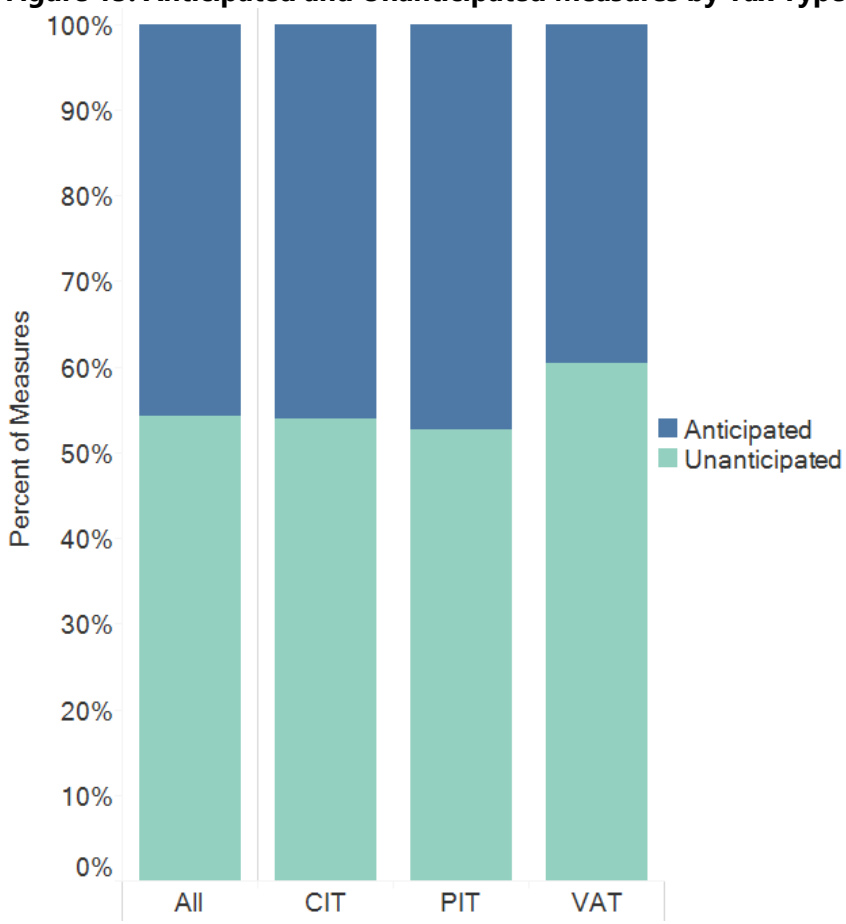
Figure 12. Implementation Lags by Country and Tax Type



Source: Tax Policy Reform Database, OECD, IBFD.

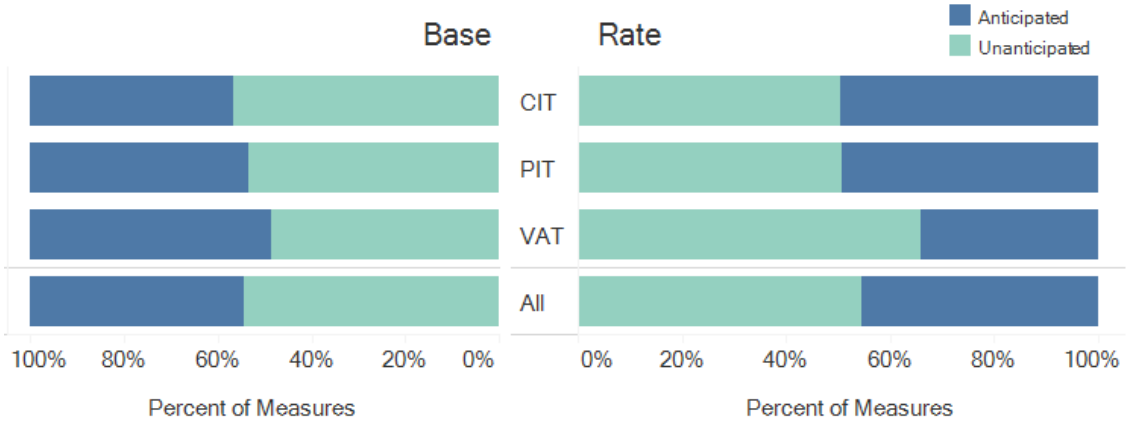
The implementation lag can be used to differentiate between tax policy changes that are likely to be anticipated or unanticipated by economic agents. Following Mertens and Ravn (2012), any measure with an implementation lag equal to or of less than 90 days is considered as "unanticipated", while any measure with a lag of more than 90 days is considered as "anticipated". Based on this definition, Figure 13 shows that over 50 percent of CIT and PIT changes in the sample have been unanticipated. The corresponding number is 60 percent in the case of VAT changes. The prevalence of anticipated relative to unanticipated measures does not change significantly for tax rate or base measures, particularly for the CIT and PIT (Figure 14). By contrast, only ⅓ of all VAT rate changes were anticipated. In terms of the direction of change (i.e., increase/decrease in tax liability), Figure 15 indicates that almost 60 percent of tax decreases were unanticipated, while about 40 percent of tax increases were anticipated. Looking at the breakdown by tax changes, one in every two tax measures that increases tax liabilities was anticipated, while more than ⅔ of VAT decreases were unanticipated.

Figure 13. Anticipated and Unanticipated Measures by Tax Type



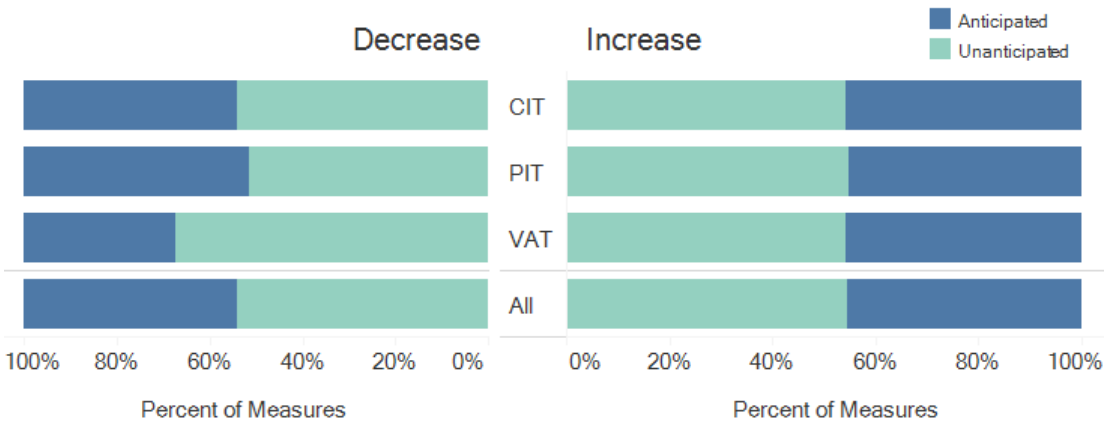
Source: Tax Policy Reform Database, OECD, IBFD.
Note: Following Mertens and Ravn (2012), (un)anticipated measures occur when the difference between the announcement and implementation date is more (less) than 90 days.

Figure 14. Anticipated and Unanticipated Measures by Reform Type



Source: Tax Policy Reform Database, OECD, IBFD.
Note: Following Mertens and Ravn (2012), (un)anticipated measures occur when the difference between the announcement and implementation date is more (less) than 90 days.

Figure 15. Anticipated and Unanticipated Measures by Direction of Change



Source: Tax Policy Reform Database, OECD, IBFD.
Note: Following Mertens and Ravn (2012), (un)anticipated measures occur when the difference between the announcement and implementation date is more (less) than 90 days.

IV. Timing of Tax Measures

This section provides preliminary evidence on empirical regularities associated with the announcement of major tax reforms. We document the frequency and composition of tax policy reforms announced over specific periods that could influence policy decisions. These include periods of economic expansion versus recessions (where certain tax policy changes may become easier to implement)[26]; fiscal consolidation episodes where governments may be forced to implement less popular tax policy changes as opposed to "normal" fiscal times [27]; and proximity to elections where political considerations may induce governments to announce popular tax policy measures[28]. The focus of this section is on major PIT, CIT, and VAT reforms, given greater availability of precise announcement dates for these measures.

Major tax policy changes appear to be clustered around specific periods, possibly reflecting waves of tax reforms. Most CIT and PIT measures were announced between the late 80s and early 2000s (Figure 16). For many European countries in the sample, this period corresponded with increasing economic integration (i.e., European Single Market, euro adoption). The frequency of major CIT and PIT reforms also increased prior to the onset of the global financial crisis. At the same time, major VAT policy changes are more evenly distributed across years (with the exception of the early 1990s).

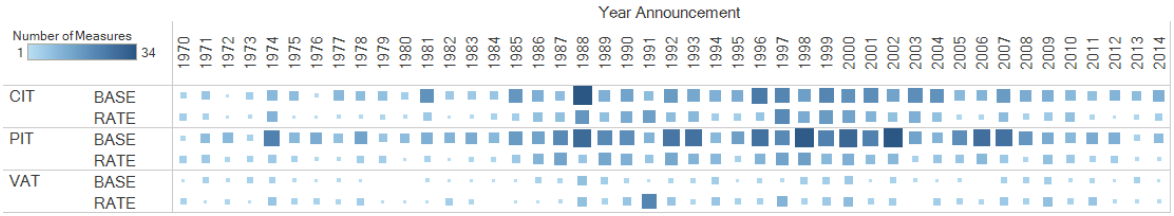
[26] See IMF (2004) for a discussion on how initial macroeconomic conditions impact the likelihood of adopting tax reforms. Here, a recession is defined as a year of negative growth.

[27] The definition of consolidation year is borrowed from Alesina and others (2015).

[28] The proximity to elections is measured as twelve months before or after election. Data on election years are taken from the "Comparative Political Data Set" (CPDS) available at http://www.cpds-data.org/. The dataset consists of annual data for 36 democratic countries for the period of 1960 to 2015 or since their transition to democracy.

Figure 16. Heat Map of Major Tax Measures by Tax and Reform Type

(count of tax changes)



Source: Tax Policy Reform Database, OECD, IBFD.

On average, countries in the sample announced 3.8 major CIT, PIT, and VAT changes per country year, half of these changes typically consisted of PIT measures (Table 6).

Table 6. Characteristics of Major CIT, PIT, and VAT Measures

(average values unless otherwise indicated)

	All sample	Expansions	Recessions	Normal fiscal times	Consolidations	Pre-elections	Post-election
All measures (in country years)	597	257	305	291	104	100	13
All measures	3.8	4.0	3.8	3.9	4.3	2.7	1.
Decrease in tax liabilities /1	2.6	2.7	1.3	2.8	1.9	2.4	1.
Increase in tax liabilities /1	1.7	1.7	2.1	1.6	2.0	1.5	1.

Source: Tax Policy Reform Database, OECD, IBFD.

1/ Decrease (increase) in tax liabilities refer to years in which there were only decreases (increases) in taxes.

Tax reforms were more frequent when economies were in a recession as opposed to an expansion (Table 6). However, the average number of tax measures announced in periods of economic expansion was slightly higher than in periods of recession. Moreover, Table 7 shows that decreases in tax liability occurred more often than increase in liabilities during expansions (41 versus 15 percent of country years[29]). Interestingly, during expansions, the average number of measures that increase tax liabilities was significantly lower (1.7 measures per country year) than the average number of measures that decrease tax liabilities (2.7 measures per country year), suggesting that tax policy could have had a pro-cyclical bias in the sample.

[29] These values are obtained by dividing the sum of the values in the "no change" column (row) across the categories "only base", "only rate", and "base and rate" for increase (decrease) changes by the total number of country year changes.

Table 7. Major CIT, PIT, and VAT Measures in Recessions and Expansions

(count of country years)

Expansion

Rate

Base	Only Increase	Only Decrease	Inc. and Dec.	No Change	Total
Only Increase	7	14	5	15	41
Only Decrease	9	40	11	46	106
Inc. and Dec.	12	26	16	17	71
No Change	16	19	4	0	39
Total	44	99	36	78	257

0 46

Decrease

Increase	Only Base	Only Rate	Base and Rate	No Change	Total
Only Base	17	14	26	15	72
Only Rate	9	4	11	16	40
Base and Rate	12	5	16	7	40
No Change	46	19	40	0	105
Total	84	42	93	38	257

Recession

Rate

Base	Only Increase	Only Decrease	Inc. and Dec.	No Change	Total
Only Increase	8	8	12	24	52
Only Decrease	12	36	9	67	124
Inc. and Dec.	17	29	22	24	92
No Change	15	17	5	0	37
Total	52	90	48	115	305

0 67

Decrease

Increase	Only Base	Only Rate	Base and Rate	No Change	Total
Only Base	24	8	29	24	85
Only Rate	12	5	9	15	41
Base and Rate	17	12	22	8	59
No Change	67	17	36	0	120
Total	120	42	96	47	305

Source: Tax Policy Reform Database, OECD, IBFD.

Note: Recessions are defined as years of negative growth. The sample comprises 22 countries and spans from 1970 to 2014 (see Table Appendix E.5 for the list of countries and years in the sample).

Major CIT, PIT, and VAT measures appear to be less frequent in consolidation periods than in normal times (Table 6). Consolidation periods show a more pronounced tax policy activism as the average number of major tax changes announced was 4.3 measures per country year, as opposed to 3.9 measures per country year during normal fiscal times. Not surprisingly, the average number of measures that increase tax liability is higher in consolidation periods than in normal times (respectively, 2.0 and 1.6 measures per country year). Table 8 further shows that during consolidation episodes decreases in tax liabilities happen in conjunction with increases in tax liability (55 percent of total country years). This suggests that governments may use policy measures that decrease tax liabilities as 'sweeteners' to buy political support for fiscal consolidation measures.

Table 8. Major CIT, PIT, and VAT Measures in Consolidation and Normal Times

(count of country years)

Normal fiscal times

Rate

Base	Only Increase	Only Decrease	Inc. and Dec.	No Change	Total
Only Increase	6	7	8	23	44
Only Decrease	10	49	14	60	133
Inc. and Dec.	12	33	14	20	79
No Change	17	16	2	0	35
Total	45	105	38	103	291

0 60

Decrease

Increase	Only Base	Only Rate	Base and Rate	No Change	Total
Only Base	20	7	33	23	83
Only Rate	10	2	14	17	43
Base and Rate	12	8	14	6	40
No Change	60	16	49	0	125
Total	102	33	110	46	291

Consolidation

Rate

Base	Only Increase	Only Decrease	Inc. and Dec.	No Change	Total
Only Increase	4	4	3	9	20
Only Decrease	4	7	3	21	35
Inc. and Dec.	12	10	10	6	38
No Change	3	3	5	0	11
Total	23	24	21	36	104

0 21

Decrease

Increase	Only Base	Only Rate	Base and Rate	No Change	Total
Only Base	6	4	10	9	29
Only Rate	4	5	3	3	15
Base and Rate	12	3	10	4	29
No Change	21	3	7	0	31
Total	43	15	30	16	104

Source: Tax Policy Reform Database, OECD, IBFD.
Note: Fiscal consolidation years are borrowed from Alesina and others (2015). The sample comprises 13 countries and spans from 1978 to 2014 (see Table Appendix E.5 for the list of countries and years in the sample).

Major tax measures were more common in the twelve months following an election (137 country years) than in the twelve months preceding an election 100 country years). In terms of the average number of measures, post-election years were characterized by 1.9 measures per country year as opposed to 2.7 measures per country year in pre-election years (Table 9). Interestingly, tax measures that increase the tax liability are more likely to occur in post-electoral periods (43 percent of 137 country years) than in pre-election years (15 percent of 100 country years). Moreover, decreases in tax liability (63 percent of country years) far outnumber increases in tax liabilities (15 percent of country years) in pre-electoral periods. These results suggest that incumbent governments want to avoid announcing unpopular tax measures before elections.

Table 9. Major CIT, PIT, and VAT Measures in Pre- and Post-Electoral Years

(count of country year)

Pre-Election

Rate

Base	Only Increase	Only Decrease	Inc. and Dec.	No Change	Total
Only Increase	0	1	0	11	12
Only Decrease	2	24	1	24	51
Inc. and Dec.	0	8	2	7	17
No Change	4	15	1	0	20
Total	6	48	4	42	100

0 24

Decrease

Increase	Only Base	Only Rate	Base and Rate	No Change	Total
Only Base	7	1	8	11	27
Only Rate	2	1	1	4	8
Base and Rate	0	0	2	0	2
No Change	24	15	24	0	63
Total	33	17	35	15	100

Post-election

Rate

Base	Only Increase	Only Decrease	Inc. and Dec.	No Change	Total
Only Increase	8	8	5	18	39
Only Decrease	4	12	5	22	43
Inc. and Dec.	12	6	14	7	39
No Change	11	4	1	0	16
Total	35	30	25	47	137

0 22

Decrease

Increase	Only Base	Only Rate	Base and Rate	No Change	Total
Only Base	7	8	6	18	39
Only Rate	4	1	5	11	21
Base and Rate	12	5	14	8	39
No Change	22	4	12	0	38
Total	45	18	37	37	137

Source: Tax Policy Reform Database, OECD, IBFD.

Note: The proximity to elections is measured as twelve months before or after election. Data on election years are taken from the "Comparative Political Data Set" (CPDS) available at http://www.cpds-data.org/. The sample comprises 17 countries and spans from 1969 to 2014 (see Table Appendix E.5 for the list of countries and years in the sample).

V. CONCLUSIONS

This paper presents a novel database of tax policy measures (TPRD) that is unique in terms of its coverage, comprehensiveness, and granularity. The TPRD identifies tax policy changes in six types of taxes (i.e., CIT, PIT, VAT, SSC, EXE, and PRO) for 23 advanced and emerging countries. It classifies these changes according to several dimensions, including whether the tax measure resulted in a rate or base change, in an increase or decrease in tax liabilities, and whether it represented a major tax change. In addition, the database provides information on whether the measure was part of a broader tax package, phased over several years, and was announced in the context of a fiscal consolidation. Given the way it is constructed, future research can further improve and expand the database.

To demonstrate the usefulness of the database, the paper presents a range of novel stylized facts about tax policy that can motivate future research. We examine the anatomy of tax policy across countries and time. Our findings suggest that changes to the tax base are frequent and typically accompany rate changes, an aspect that is are often ignored in the literature. Second, tax policy measures are often taken as part of a broader reform packages, which is another dimension of tax policy for which little information has existed up to now. In most advanced and emerging economies, changes to PIT are most frequent, followed by changes to CIT and the VAT. The average implementation lag of PIT, CIT, and VAT measures is around 2-5 months, providing lead time for economic agents to adjust their behavior, but this differs across tax types. Finally, while

these findings hold broadly across countries, there is significant cross-country heterogeneity on the nature and timing of tax reforms.

The paper also investigates whether the basic characteristics of tax policy decisions vary depending on the timing of such measures (e.g., in recessions, during fiscal consolidations, proximity to elections). We find that the number of announced tax policy changes differs significantly, tending to be markedly lower before elections. Moreover, the average number of measures that decrease tax liabilities during expansions are typically higher than during recessions, potentially suggesting a pro-cyclical bias to policymaking. During fiscal consolidations, governments tend to adopt measures that both increase and decrease tax liabilities. This suggests that governments may try to offset the adverse effects of implementing politically difficult tax measures. Finally, decreases in tax liability far outnumber increases in pre-electoral periods.

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Appendix A. Data Source and Definitions

This appendix describes in detail the data sources used in the compilation of the TPRD, and the definitions of the variables.

Data Sources

Organization for Economic Co-operation and Development (OECD) and International Bureau of Fiscal Documentation (IBFD)

The database covers tax policy reforms in 23 countries over the last four decades. The countries covered in the database are Australia, Austria, Brazil, Canada, China, Czech Republic, Denmark, France, Greece, Germany, India, Ireland, Italy, Japan, Korea, Luxembourg, Mexico, Poland, Portugal, Spain, Turkey, United Kingdom, and the United States. The primary source of information was the OECD Economic Surveys. These surveys are publicly available for download from the OECD website. [30] The other primary source of information was the IBFD archives, in the form of news clips. The archives contain detailed tax information from 1988 onwards.[31]

Tax Rate Databases

To check the accuracy and coverage of our database, we performed various checks against external rate databases. We compared instances where our database recorded a major rate change to changes in tax rate levels from various internal and external sources. These are listed below.

- *IMF Tax Rate Database*. The IMF Tax Rate Database is compiled internally, containing the statutory top rates for CIT, PIT, and VAT. The database covers the period 1980 to 2015.
- *European Commission Tax Indicator Database*. This database contains information on top statutory CIT and PIT rates, standard and reduced VAT rates, labor-implicit tax rates (used for checks of SSC rates), and consumption-implicit tax rates (used for checks of EXE rates), and served as a secondary source for CIT, PIT, VAT, SSC, and EXE rates. The database covers the period 1995 to 2015.

- *Global KPMG Tax Rates*. The KPMG database served as a secondary source of information for CIT, PIT, and VAT rates, and also contains information on the social security rates for employees and indirect rates. The database covers the period 2006 to 2015.

[30] The surveys can be downloaded in PDF format from http://www.oecd.org/eco/surveys/ and are subject to standard copyright provisions (for more information see http://www.oecd.org/termsandconditions/).

[31] The news clips are available to all IBFD subscribers and can be accessed through the IBFD website https://www.ibfd.org/IBFD-Tax-Portal . IBFD material is covered by specific copyright provisions that are available at https://www.ibfd.org/Copyright-IBFD-2018.

- *USAID Collecting Taxes Database*. The USAID database was used as another supplementary source for CIT, PIT, and VAT rates. The database covers the period 2007 to 2012.

Other Tax Narratives

As another check for accuracy, we compared our database to other databases constructed using a narrative approach. The other narrative databases typically only covered tax changes in one country. The countries for which narrative databases were considered are United States (Romer and Romer, 2009), the United Kingdom (Cloyne, 2013), Spain (Gil and others, 2017), and Portugal (Pereira and Wemans, 2013). In a systematic manner, we verified whether all the major tax changes included in the narrative databases were also recorded in our database. Figure Appendix E.3 lists the countries and years for which possible information gaps have been identified.

Definitions

The database contains the following variables:

Sentence_OECD is a textual variable containing an excerpt from the OECD Surveys on OECD and non-OECD countries that mention changes in one or more of the six tax types covered in the database (i.e., PIT, CIT, VAT, SSC, EXE, and PRO). The quality of textual information extracted from OECD country report varies significantly: some textual fragments are very generic (e.g., the government reduced personal income taxation) while others provide details (e.g., the authorities increased the VAT standard rate from 15% to 20%). In addition, each excerpt can contain one or multiple tax changes.

Paragraph_OECDs is a textual variable containing the paragraph from which the excerpts included in the 'Sentence_OECD' variable were taken.

Tax_type is a categorical variable identifying which type of tax is discussed in the Sentence_OECD variable. The database covers six types of taxes that are defined following the Government Finance Statistics Manual (GFSM) 2014 (Table Appendix A.1). [32]
Specifically:

- ***PIT*** includes GFSM items 1111 (tax payable by individuals) and the portion of item 1113 (other taxes on income, profits, and capital gains) that refers to personal taxation.

- ***CIT*** includes the GFSM items 1112 (taxes payable by corporations and other enterprises) and the portion of item 1113 (other taxes on income, profits, and capital gains) that refers to corporate taxation.

[32] The GFSM 2014 is available at https://www.imf.org/external/Pubs/FT/GFS/Manual/2014/gfsfinal.pdf

- ***VAT*** includes the GFSM items 11411 (value-added taxes), 11412 (sales taxes), 11413 (turnover and other general taxes on goods and services).

- ***EXE*** includes the GFSM item 1142 (excise)

- ***SSC*** includes the GFSM items 112 (taxes on payroll and workforce) and 12 (social contributions).

- ***PRO*** includes the GFSM item 113 (taxes on property).

Importantly, the above mention classification excludes the following GFSM tax items: 11414, 1143, 1144, 1145, 1146, 115, 116, 13, and 14. This reflects two considerations: namely that OECD Surveys do not consistently cover these items, as well as the decision to focus the analysis on major domestic taxes.

Tax_reform type is a categorical variable indicating whether the tax measure reported in Sentence_OECD refers to a rate (RATE) or base (BASE) change. Note that changes in per unit (i.e., specific) taxes are classified as rate changes.

Tax_change is a categorical variable reporting whether the tax measure described in Sentence_OECD entails an increase (INC) or decrease (DEC) in the rate or base.

Tax_major is a dummy variable taking on value 1 if the change is major. The following definitions of major rate and base changes are used in the database:

Major *rate changes* are identified when the rate changes by at least 1 percentage point in absolute terms (i.e., $\Delta RATE \geq 1pp$) or when, in absence of quantitative information in the Sentence_OECD or Paragraph_OECD variables, the text describing the measures says that the change is major. In the case of per unit taxes, the determination on whether a change is major is based on an assessment of the language used in the Sentence_OECD or Paragraph_OECD variables.

Table Appendix A.1: Summary Classification of Revenue According to GFSM 2014

1	**Revenue**
11	**Taxes**
111	Taxes on income, profits, and capital gains
1111	Payable by individuals
1112	Payable by corporations and other enterprises
1113	Other taxes on income, profits, and capital gains[1]
112	Taxes on payroll and workforce
113	Taxes on property
1131	Recurrent taxes on immovable property
1132	Recurrent taxes on net wealth
1133	Estate, inheritance, and gift taxes
1135	Capital levies
1136	Other recurrent taxes on property
114	Taxes on goods and services
1141	General taxes on goods and services
11411	Value-added taxes
11412	Sales taxes
11413	Turnover and other general taxes on goods and services
11414	Taxes on financial and capital transactions
1142	Excise
1143	Profits of fiscal monopolies
1144	Taxes on specific services
1145	Taxes on use of goods and on permission to use goods or perform activities
11451	Motor vehicle taxes
11452	Other taxes on use of goods and on permission to use goods or perform activities[1]
1146	Other taxes on goods and services
115	Taxes on international trade and transactions
1151	Customs and other import duties
1152	Taxes on exports
1153	Profits of export or import monopolies
1154	Exchange profits
1155	Exchange taxes
1156	Other taxes on international trade and transactions
116	Other taxes
1161	Payable solely by business
1162	Payable by other than business or unidentifiable
12	**Social contributions [GFS]**
121	Social security contributions [GFS]
1211	Employee contributions [GFS]
1212	Employer contributions [GFS]
1213	Self-employed or unemployed contributions [GFS]
1214	Unallocable contributions [GFS]
122	Other social contributions [GFS]
1221	Employee contributions [GFS]
1222	Employer contributions [GFS]
1223	Imputed contributions [GFS]
13	**Grants**
131	From foreign governments
1311	Current
1312	Capital
132	From international organizations
1321	Current
1322	Capital
133	From other general government units[1]
1331	Current
1332	Capital
14	**Other revenue**
141	Property income [GFS]
1411	Interest [GFS][1]
1412	Dividends[1]
1413	Withdrawals of income from quasi-corporations
1414	Property income from investment income disbursements
1415	Rent
1416	Reinvested earnings on foreign direct investment
142	Sales of goods and services
1421	Sales by market establishments
1422	Administrative fees
1423	Incidental sales by nonmarket establishments
1424	Imputed sales of goods and services
143	Fines, penalties, and forfeits
144	Transfers not elsewhere classified
1441	Current transfers not elsewhere classified
14411	Subsidies[1]
14412	Other current transfers not elsewhere classified[1]
1442	Capital transfers not elsewhere classified
145	Premiums, fees, and claims related to nonlife insurance and standardized guarantee schemes[1]
1451	Premiums, fees, and current claims[1]
1452	Capital claims

Source: GFSM 2014.

Major *base changes* are identified in different ways depending on the type of tax:

- **CIT**. Following Kawano and Slemrod (2016), the database classifies as major CIT base measures any change affecting: R&D promotion (e.g., tax credit), investment promotion (e.g., depreciation rules), loss-carry rules, thin capitalization, and capital gains. If a CIT base change does not fall into any of the above-mentioned category, then it is classified as 'other base changes'. Measures included in the latter group are classified as 'major' if the language used in the Sentence_OECD or Paragraph_OECD variables points to a large change. For example, any change that is reported to affect large groups of taxpayers or has a potential to mobilize significant amount of resources is classified as major.

- **PIT**. Following OECD (2006 and 2016b), major PIT base changes are those that affect: standard relief (e.g., single person or family deductions, tax credits); child relief (e.g., tax credit, deductions); relief on capital gains; interest relief; relief for SSC, insurance premiums, and private pensions.[33] If a PIT base change does not fall into any of the above-mentioned category, then it is classified as 'other base changes'. PIT base changes described in the Sentence_OECD (e.g., bracket changes, taxation of dividends) are classified as major based on an assessment of the language used in the Sentence_OECD or Paragraph_OECD variables. In particular, any change that is reported to affect large groups of taxpayers or potentially mobilize significant resources is classified as major.

- **VAT**. Following OECD (2016a) and IMF (forthcoming), the database classifies as major VAT base measures affecting exemptions: on food items, medical supplies, and education. These categories are selected from common exemptions available in OECD countries with the focus on the largest items. All other VAT base changes described in the Sentence_OECD (e.g., introduction of VAT, generic exemptions) are classified as other based changes. These changes affect not only VAT but also other taxes on goods and services that are similar to VAT (e.g. general sales tax). Exemptions are defined as ("input taxed supplies") supplies for which VAT is not levied on the amount charged by the provider while the latter is not allowed to deduct related input tax.

- **SSC, EXE, and PRO**. Given the lack of consensus in the literature on what constitutes a major base change, the database classifies as major any change that affects large groups of taxpayers or has the potential to mobilize significant resources. This assessment ids made based on all available information contained in the description of the measure in OECD Surveys and IBFD archives.

Base_category is a numeric variable that is relevant only for PIT, CIT, and VAT base changes. It takes on values between 1 and 6. In particular:

- For CIT base changes:

1 identifies changes focusing on R&D promotion (e.g., tax credit),
2 identifies changes focusing on investment promotion (e.g., allowances, depreciation promotion rules).
3 identifies changes focusing on loss-carry rules.
4 identifies changes focusing on thin capitalization.
5 identifies changes focusing on capital gains.

[33] Income might include the following items: wages, salaries and tips, business income (income from unincorporated businesses), capital income (dividends, capital gains, interest payments), rents, royalties, fringe benefits, imputed rents from owner-occupied housing and other consumer durables, income transfers (disability compensation, unemployment benefits, sick pay, etc.), pension income, annuities, life insurance cash value, and gifts and bequests.

6 identifies other CIT base changes (e.g., generic exemptions, introduction of income levy)

- For PIT base changes:

1 identifies changes to standard relief (e.g., single or family deductions, tax credits).
2 identifies changes to child relief (e.g., tax credit, deductions).
3 identifies changes to relief on capital gains
4 identifies changes to interest relief;
5 identifies changes to relief for SSC, insurance premiums, and private pensions
6 identifies other PIT base changes (e.g., introduction of a new income levy)

- For VAT

1 identifies changes to exemptions on food items.
2 identifies changes to exemptions on medical supplies.
3 identifies changes to exemptions on education.
4 identifies other VAT base changes.

Base_category_label is a textual variable that provides the labels for the Base_category_all variable. It indicates the tax type (CIT, PIT, or VAT), and the general base category. Specifically:

- For CIT base changes: R&D promotion; Investment promotion; Loss-carry rules; Thin capitalization; Capital gains; Other base changes.
- For PIT base changes: Standard relief; Child relief; Capital gains; Interest relief; SSC, pension, and insurance relief; Other relief.
- For VAT base changes: Exemptions on food; Exemptions on medical supply; Exemptions on education; Other base changes.

Tax_package is a dummy variable taking on value 1 if the measure described in the Sentence_OECD is part of a package (i.e. announced with other tax measures). Different tax measures are considered as a package if either the Sentence_OECD says so or the measures share the same announcement date.

Tax_package_id is an identifier for the specific packages of tax measures in the database. For example, the first observed tax package in country X would have Tax_package_id equal to 1, the second observed package would have Tax_package_id equal to 2, and so on and so forth. The measures were grouped by those which had the same sentences, or the same announcement dates. The packages were then checked by the economists to ensure that all the measures grouped together were in fact taken as part of a package.

Tax_multiyear is a dummy variable taking on value 1 if the measure described in Sentence_OECD is reported to be phased over several years.

Announcement_date is a date variable in the format MM/DD/YYYY that reports the date in which the measure described in Sentence_OECD was officially announced by representatives of the government. Examples of announcements are approval by the Cabinet of Ministers, presentation to Parliament, official speech by the President or the Minister of Finance. In case of missing day, month, or year the announcement variable will include an "x". For example, if only the month and year of a measure is known, the announcement_date variable will show 4/x/1989. In a limited number of cases, the announcement dates are based on news from the press. For the period prior to 1988, most of the dates come from the OECD calendars, which are annexes to the OECD country reports that contain the most important policy changes in a given year. For the period 1988-2014, in the current version of the database, announcement dates come from the IBFD news clips for PIT, CIT, and VAT. Announcement dates for the other types of taxes are extracted from the information available in Sentence_OECD or Paragraph_OECD variables.

Implementation_date is a date variable in the format MM/DD/YYYY that reports the date starting from which the measure described in Sentence_OECD is in place. Typically, implementation dates coincide with the beginning of the fiscal year. In some cases, however, implementation dates are given by the approval of an Executive order or similar, the publication in the Official Gazette. In case of missing day, month or year the implementation variable will include an "x". For example, if only the day and month of a measure is known, the implementation_date variable will show x/x/1995. In the case of measure that were announced but never implemented the implementation_date variable shows "x/x/x". For the period prior to 1988, most of the dates come from the so-called OECD calendars, which are annexes to the OECD country reports that reports the most important policy changes undertaken by a country in specific years. For the period 1988-2014, in the current version of the database, announcement dates come from the IBFD news clips for PIT, CIT, and VAT. Announcement dates for the other types of taxes are extracted from the information available in Sentence_OECD or Paragraph_OECD variables.

Merge_MATCH is a numeric variable relevant only for measures that have announcement and implementation dates coming from IBFD news clips (i.e., PIT, CIT, and VAT tax changes between 1988- 2014). It takes value 1 when there is a "perfect" match between the tax measure discussed in Sentence_OECD and the content of the IBFD news clip. It takes value 2 if the match is "imperfect" (e.g., similar measure, different information about the size of the tax change, missing implementation date). It takes value 3 if there is "no match" between the tax measure discussed in Sentence_OECD and the content of any IBFD news clip in the period 1988-2014.

IBFD_Measure is a text variable relevant only for measures that have announcement and implementation dates coming from IBFD news clips (i.e., PIT, CIT, and VAT tax changes between 1988-2014). It reports the ID of the news discussing the announcement and/or implementation of the tax measure described in the Sentence_OECD variable. Importantly, only IBFD subscribers will be able to access the content of the IBFD news through the TPRD portal or the IBFD website.

Consolidation_year is a dummy variable taking on value 1 if the year of the announcement_date variable is a consolidation year as defined in Alesina and others (2017) and Dabla-Norris and Lima (forthcoming).

t0-t8 are numeric variables reporting, when possible, the intended revenue yield of a specific measure or set of measures in the year of the announcement (t0), one year ahead (t1), two years ahead (t2), up to eight years ahead (t8) in a consolidation year (i.e., when the variable Consolidation_year is equal to 1).

Currency_consolidation is a variable indicating the currency of t0-t8 (the intended revenue yields of a specific measure or set of measures).

It is important to note that we followed some conventions in coding several tax measures. In particular:

- The introduction/removal of a tax is coded as a BASE measure. Consequently, the replacement of one or several taxes with a new tax is coded as two BASE measures, one related to the removal of the tax(es) and the other related to the introduction of the new tax.
- Changes in income brackets are coded as BASE measures unless it is specified otherwise in the text of the Sentence_OECD variable.
- A reduction of in the number of tax brackets is coded as a base broadening measure (i.e., Tax_reformtype=BASE and Tax_change=INC), following the assumption that simplification will boost compliance.
- Changes in per unit taxation is coded as a RATE change.
- The extension or postponement of a tax measure (e.g., a temporary surcharge is maintained for an additional year, the reduction in PIT rate is delayed) were coded as an actual tax change aimed at avoiding the effects of the planned tax change (e.g., a delay in the reduction of PIT rates was coded as RATE INC).

Appendix B. Steps in Building the TPRD

Step 1. Text Mining

The first step in constructing the database was downloading the OECD Economic Surveys for the countries in PDF format. The surveys were also divided into paragraphs, regardless of the content, to ensure we kept all the raw text available. They were then processed by the Provalis Prosuit® software, using the text-based rules to extract the relevant pieces of text. The software selected specific sentences containing the relevant text, which we then matched to the origin paragraphs in Stata. These sentences were exported to country-specific Excel files for the economists to manually check and code.

Step 2. Manual Coding

A number of manual coding were performed. Specifically, all the sentences preselected by the software were examined to determine if the content of the sentences described actual tax policy changes. If so, the sentences were classified along the different dimensions discussed in Appendix A (e.g., type of tax, type of change, direction of change, etc.). In this round, each sentence could contain multiple measures. The manually coded information was then processed in Stata, and the sentences with multiple measures were separated so that each line in the database was referring to a unique measure. These were then exported to Excel files again.

Step 3. Dating Tax Measures

Information from IBFD archives and OECD calendars was used to determine the exact announcement and implementation dates for each measure. The news clips from the IBFD were compiled into country-specific files and matched to the measures identified in Step 2. During this step, additional measures were sometimes found, and added to our database. For measures that occurred outside the span of the IBFD (1988 and onwards), the OECD's Calendar or Chronology of main economic events was used, as these often contain detailed information and exact dates of tax policy changes. The merge_MATCH variable was used to indicate whether the IBFD archives contained information for the tax measure. Multiple rounds of checks were performed to minimize the number of measures for which exact announcement and implementation dates could not be found.

Step 4. Cross-checks Against Other Databases

The next step was to check the accuracy of the information on observed tax measures. The accuracy of documented tax rate changes was verified by comparing our database to various external tax rate databases (see Appendix A). We calculated the annual change in tax rate levels from external sources, and compared the resulting instances of rate changes to those in our database. As our database does not quantify the rate change, we could only check if our database contained a rate change in the same direction. This resulted in four cases: 1) Match – there was a change in the tax rate according to the external sources, and our database also indicated that there was a rate change in the same direction. 2) Dating problem – our database

indicated a rate change in a certain direction, but the external databases indicated that the rate changed in the same direction during the previous or following year. 3) Coding problem – our database contained a rate change in a certain year, but the external databases indicated the rate changed in the *opposite* direction. If there was no change in the same year, but the rate changed in the opposite direction during either the previous or following year, we also marked this as a coding problem. Additionally, coding problem was used to indicate if the external sources contained a rate change in a certain year, but our database did not have any rate change in that year, the previous year, or the following year. 4) Database only – our database indicated a rate change, but the external databases did not indicate any rate change in that year, the previous, or the following year. This last category was not seen as problematic, since the external sources contained information on the top statutory CIT, PIT, and VAT rates, whereas our database covered many different types of rates (such as reduced and marginal rates). For the measures which were marked as dating or coding problems, they were checked against the IBFD news clips for errors.

Step 5. Add Information on Intended Revenue Yields during Consolidation Episodes

The final step was to add information from Dabla-Norris and Lima (forthcoming) on the intended revenue yield for the tax measures announced during a consolidation year as defined in Alesina and others (2017). When possible, this was done by pairing the unique identifier for each validated measure in our database with the unique identifier for the measures in the consolidation database from Dabla-Norris and Lima. Because the consolidation database has a very detailed accounting of tax measures, the pairing process often resulted in associating one measures from the TRPD with several measures from the consolidation database. Once the pairing process was completed, the information on the intended revenue yields of all paired measures was merged into our database. In the cases in which a measure from the TPRD was paired to several measures in the consolidation database, the intended revenue yield is given by the sum of the intended revenue yields of all associated measures from the consolidation database.

Appendix C. The Tax Vocabulary

An important step in developing the TPRD was the extraction of textual fragments that discussed tax policy measures using the Provalis Prosuit® software. One valuable feature of this software is that it allows one to easily define sets of keywords and text-based rules (i.e., categories), which can then be used to analyze and classify the content of multiple documents. The ensemble of these categories represents a framework that the user can customize depending on the objective of the analysis.

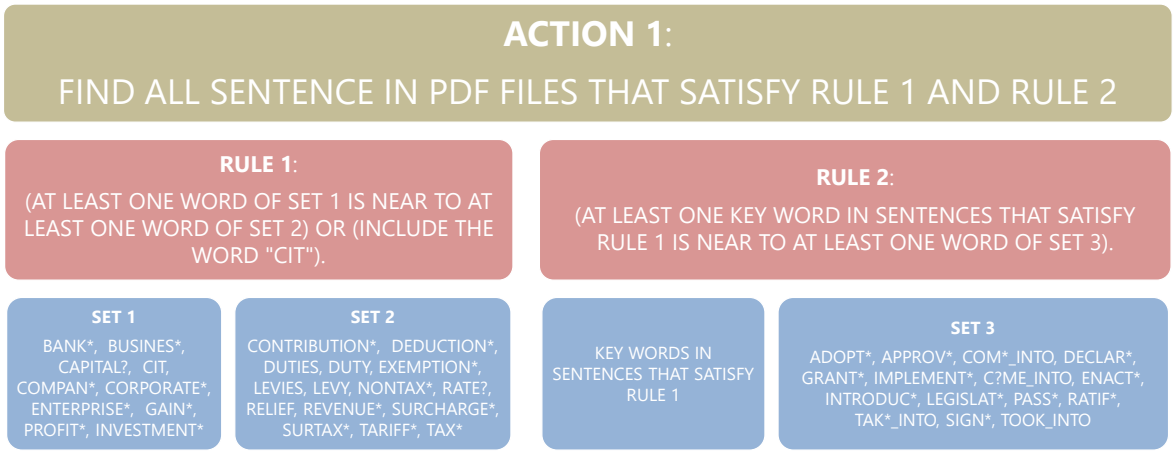
In the case of the TPRD, this framework models how different tax measures are discussed in the OECD and IBFD documents, namely the terms typically used to identify a specific tax and how these terms are related to each other and/or to those terms used to identify other taxes. In this regard, the framework is essentially a body of words used in the specific context of tax policy, hence the name tax vocabulary. The tax vocabulary is then used to classify the content of OECD and IBFD documents with the intention of identifying the passages in the documents which are more likely to discuss changes in any of the six taxes of interest (i.e., PIT, CIT, VAT, SSC, EXE, PRO).

Two types of sets of keywords were used to identify tax policy changes in this analysis. One set contained terms typically used to identify each one of the six types of taxes examined (e.g., "corporate tax", "value added tax", "income tax", "social security contributions", "excise", "property tax"). The other set was comprised of terms that capture actions, such as announcement, postponement, implementation, abolishment, adoption, and change. These two sets were interacted with each other through a number of text-based rules, which operated at the level of single sentence in each OECD and IBFD document. These rules would select any sentence from the OECD and IBFD documents in which at least one keyword from set identifying the six taxes is close to at least one keyword from the set identifying actions (see Table Appendix C.1 for an example of the rule used in the case of CIT). These sets of keywords were developed based on discussions with IMF tax experts and on frequency analysis which allowed to identify the terms most used in the OECD and IBFD documents.

The concept of proximity is expressed in terms of maximum distance between words belonging to the different sets of keywords. In light of the technical and concise language used in the OECD and IBFD documents, the maximum distance allowed between keywords was set to 5 words (i.e., any sentence with keywords separated by more than 5 words was not classified as containing relevant information on policy measures). While the limit of 5 words is arbitrary and might appear quite restrictive, it is important to note that because the documents examined are technical and characterized by precise language it is unlikely that one would find relevant information on changes in the six taxes examined when the keywords are not very close. In the case of this analysis the limit of 5 words appeared to strike the right balance between the objective of minimizing the likelihood of missing tax measures and that of minimizing the selection of irrelevant information.

It is important to stress that while the tax vocabulary represents a powerful tool to identify relevant information on tax policy changes in highly unstructured documents, it's effectiveness hinges squarely on the adequacy of the keywords used, the precision of rules developed, and the quality of the documents processed.

Table Appendix C.1: Example of Rules to Identify Adoption of CIT Measures



*Legend for the set of words: *, ?, # and wildcards and stand respectively for any character(s), any letter, and any number. The character "_" is equivalent to space.*

Appendix D. Quality Checks

The quality of the information documented in the database was assessed through a number of checks. These aimed at confirming the validity of the coding and dating of the tax measures in the database, as well as identifying possible information gaps.

A first battery of checks focused on identifying possible redundancies in the information presented in the database. Redundancies were not unusual as the text mining technique used to develop the database would select any passage in the OECD documents and IBFD news that is likely to discuss a change in one of the six taxes examined, including passages that elaborate on measures that were already discussed in other reports (i.e., repetitions). Excerpts that were identified as talking about tax measures already included in the database were examined with the view to keep only one excerpt, possibly the one containing more detail on the tax measure.

A second set of checks looked at the accuracy and consistency of the metadata associated with each measure in the database. This was done by confirming the information on the different dimensions of a tax policy change (e.g., type of tax, type of change, direction of change, importance of the change) documented in the database with the information on the same measures that could be found in the OECD calendars and/or the IBFD news archives. In addition, for all measures that are part of a tax package additional checks were performed with the objective of verifying the consistency of the information on the timing (i.e., announcement and implementation dates) of tax policy changes across tax types.

A third battery of checks focused on identifying possible information gaps in the database. First, information gaps may originate from the methodology used to extract relevant information from the OECD Surveys (i.e., text mining techniques). Indeed, there is always a risk of information loss associated with the automatic processing of textual information, and such risk is negatively correlated with the quality of the digital support in which the information is stored (e.g., old PDF files of scanned documents are typically more difficult to read for a software than PDF files produced from digital documents). Another reason for information gaps may be related to the source of information itself (i.e., the OECD Economic Surveys). In many countries, the OECD Economic Surveys were on a biannual rather than annual cycle. Biannual Surveys may focus on a few major tax policy changes, whereas annual Surveys may cover also less macro-critical tax policy measures. This will result in some countries having a broader coverage of tax policy changes than others. A third source of information gaps is human error in the process of determining whether the excerpts from the OECD Surveys that are selected with the text mining techniques are eventually deemed to be valid tax measures.

The accuracy of the information about PIT, CIT and VAT rate changes documented in the database was verified by comparing the direction of rate changes recorded in the database with the magnitude of annual rate changes available from related external databases (see Appendix A

for sources). These checks allowed to identify a number of inconsistencies between the information in the database and that in external rate. The strategy followed to deal with the identified inconsistencies was as follows:

- All inconsistencies related to the coding and/or the timing of CIT, PIT, and VAT measures that were documented in both the database and external rate databases were reviewed to ascertain whether the identified inconsistencies were due to a misrepresentation of the measure discussed in the OECD Economic Surveys, differences in coding conventions, or owing to the coverage of the database compared to the external rate databases (i.e., the database covers rate changes that are not tracked in external rate databases, for example changes in the tax rate for capital gains). All identified misrepresentations of measures from the OECD Economic Surveys were corrected. On the other hand, all identified inconsistencies related to coding conventions or the broader coverage of the external database were simply documented and no further action was taken. A typical example of inconsistencies related to coding conventions are rate changes phased overall several years. Unlike in external rate databases, these changes are recorded only once in the database when the first tax change occurs (i.e., no entry for the planned rate changes in the following years), unless the OECD Economic Surveys explicitly discuss subsequent changes when they are implemented.

- All inconsistencies originating from information gaps in the database (i.e., rate changes that are included in the external rate databases but not in the TPRD) were documented and subject to further analysis to determine whether it was possible to retrieve information about their nature from available OECD and IBFD documents as well as from alternative sources, including national sources. Measures for which it is be possible to retrieve sufficient information on their nature will be added to the next version of the database.

The accuracy of the information about PIT, CIT and VAT base changes could be verified only for those base measures that were dated using the IBFD archives, given the lack of cross-country quantitative information on tax base changes. This allowed us to identify several inconsistencies between the information reported in the TPRD and the IBFD archives. All inconsistencies were reviewed with a view to determine whether these were due to a misrepresentation of the measure discussed in the OECD Economic Surveys or due to an information gap. As in the case of checks for rate changes, the following strategy was followed in addressing identified inconsistencies:

- All identified misrepresentations of base measures presented in the OECD Economic Surveys were corrected.

- All inconsistencies originated from information gaps in the database (i.e., base changes that are included in the external rate databases but not in the database) were documented and made the object of further analysis to retrieve information about their nature from IBFD archives, IMF staff reports, and alternative sources, including national sources. Measures for

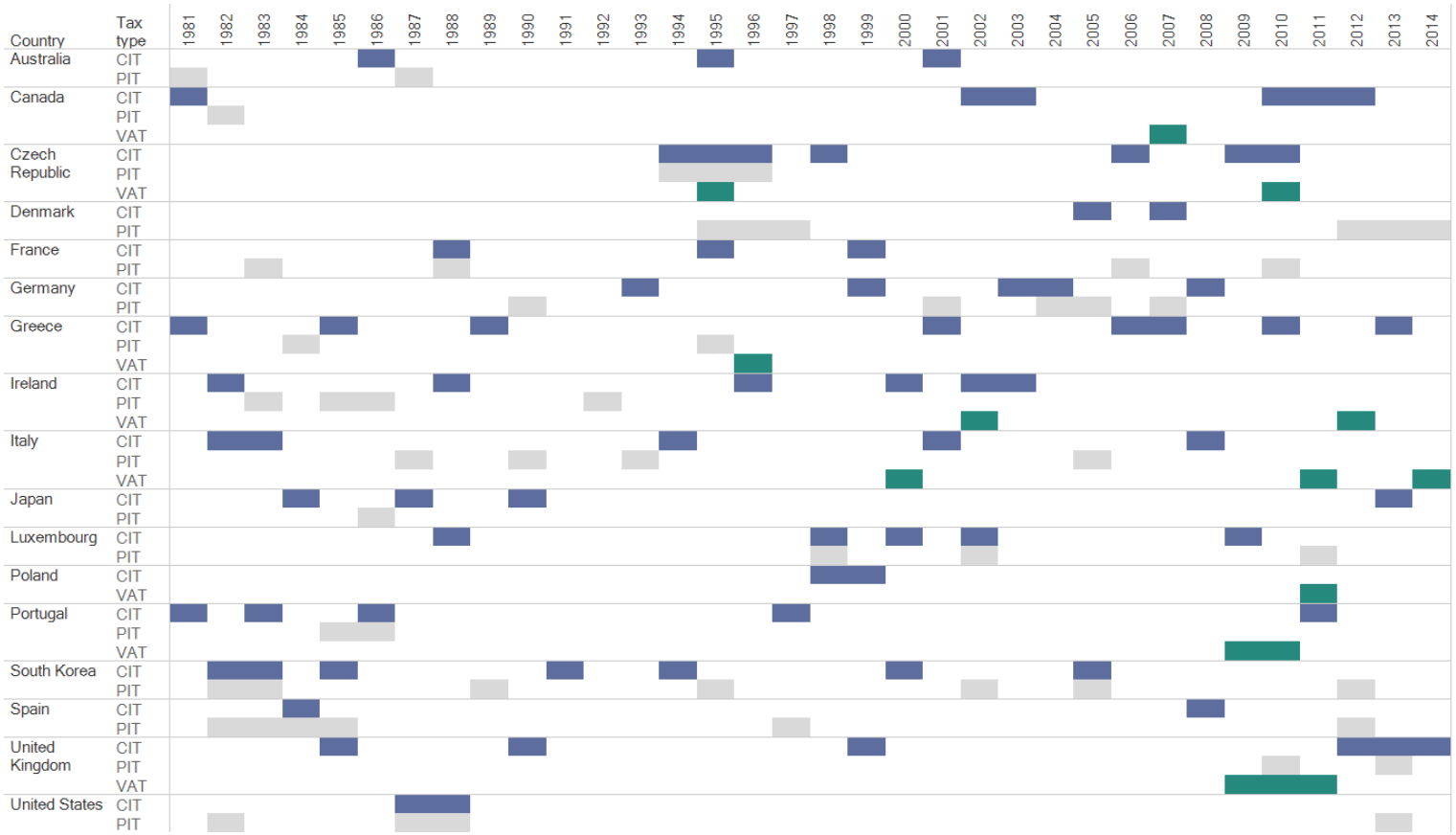
which it is be possible to retrieve sufficient information on their nature will be added to the next version of the database.

Figure Appendix E.1and Figure Appendix E.2 provide a summary of the identified and outstanding information gaps for PIT, CIT, and VAT rate and base changes.

In an effort to ensure that the database is as complete as possible, the information for some countries was also checked against other sources, namely, well-established databases that were constructed using a narrative approach. Based upon the availability of such narrative databases, the countries for which these checks were performed are the United States (Romer and Romer, 2009), the United Kingdom (Cloyne, 2013), Spain (Gil and others, 2017), and Portugal (Pereira and Wemans, 2013). For these countries, the checks aimed at verifying that major tax measures discussed in the narratives are included in our database, and at documenting and classifying any major information gaps. These gaps are reported in Figure Appendix E.3 and are currently analyzed with the goal of retrieving, when possible, additional information from IBFD archives, IMF staff reports, and alternative sources, including national sources. Tax measures for which such retrieval is possible will be added to the next version of the database.

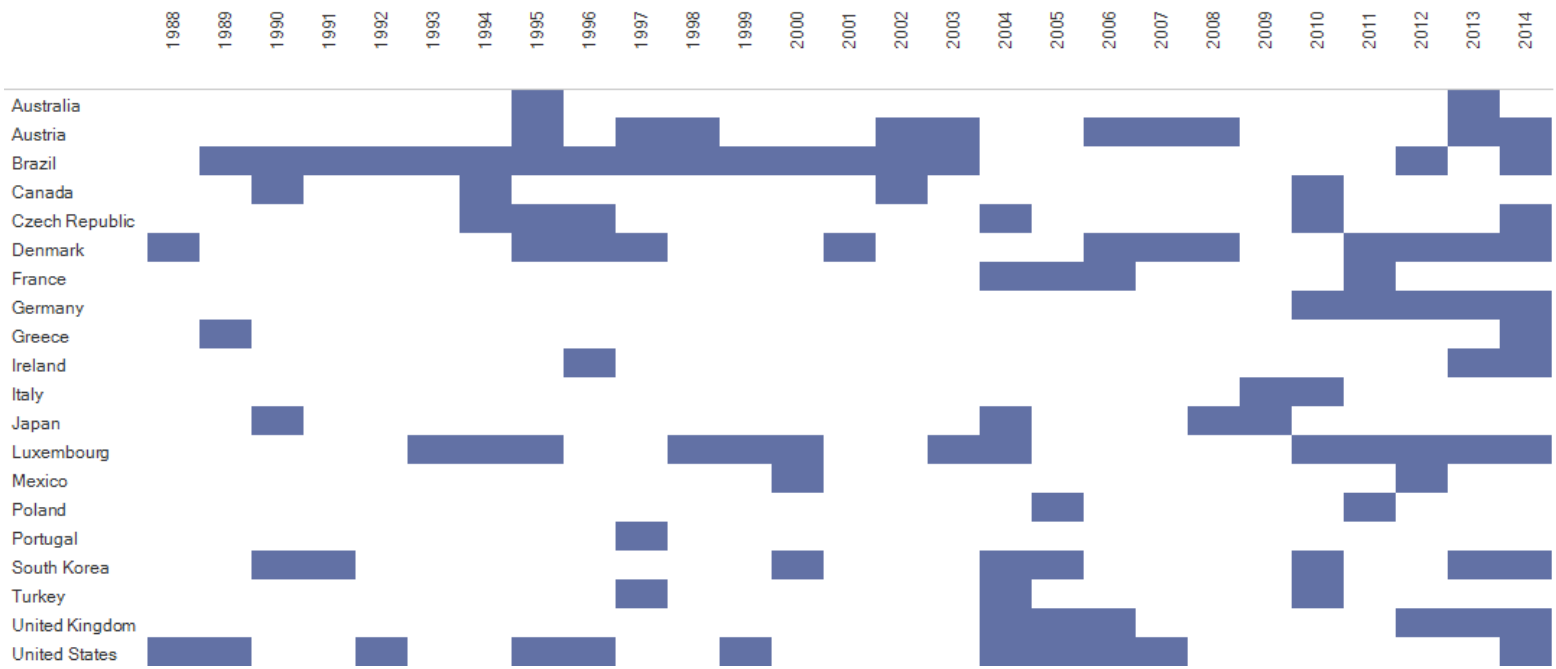
Appendix E. Tables and Figures

Figure Appendix E.1. Identified Information Gaps in OECD Surveys



Source: IMF Tax Rate Database, European Commission Tax Indicator Database, Global KPMG Tax Rate, and USAID Collecting Taxes Database.
Note: Solid bars indicate that there is at least one tax policy measure in the external sources that is not included in the current version of the TPRD for a specific year. Blue bars identify CIT changes, grey bars identify PIT changes, and green bars identify VAT changes. For more information on the type of checks see Appendix D.

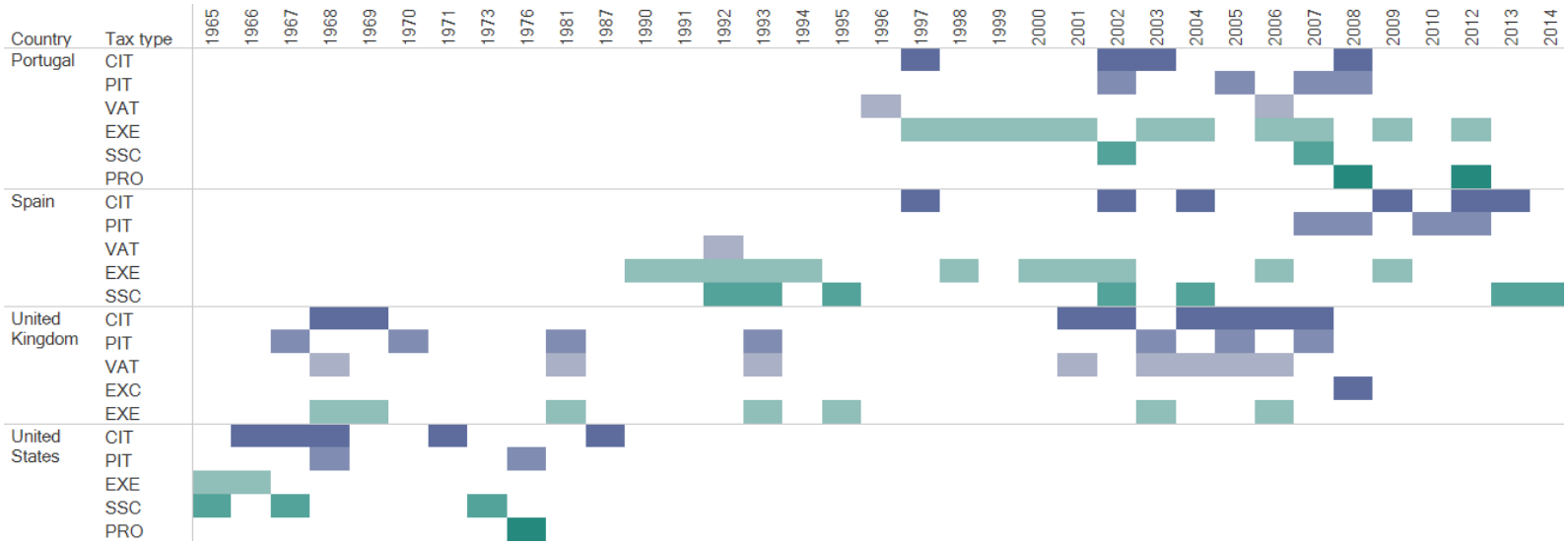
Figure Appendix E.2. Identified Information Gaps from OECD Surveys



Source: IMF, OECD, IBFD, and national sources.

Note: Solid bars indicate that there is at least one tax policy measure in the external rate databases that is not included in the current version of the TPRD for a specific year. For more detail see Appendix D.

Figure Appendix E.3. Identified Information Gaps Based on Narrative Databases



Source: Romer and Romer (2009), Cloyne (2013), Gil and others (2017), and Pereira and Wemans (2013).

Note: Solid bars indicate that there is at least one tax policy measure in the narrative databases that is not included in the current version of the TPRD for a specific year. Dark blue bars identify CIT changes, blue bars identify PIT changes, light blue bars identify VAT changes, light green bars identify EXE changes, green bars identify SSC changes, and dark green bars identify PRO changes. For more information on the type of checks see Appendix D.

Table Appendix E.1. Distribution of Tax Policy Measures by Type and Direction of Change in Each Country in the Sample

	Country year						Count						All changes		
	Base			Rate			Base			Rate					
	Decrease	Increase	All changes	Decrease	Increase	All changes	Decrease	Increase	All changes	Decrease	Increase	All changes	Country year	Count	Average per country year
Australia	25	23	33	23	17	32	64	45	109	46	27	73	41	182	4.4
Austria	11	8.0	15	7.0	7.0	14	28	24	52	14	10	24	18	76	4.2
Brazil	10	5.0	11	4.0	6.0	8.0	27	9.0	36	8.0	8.0	16	12	52	4.3
Canada	31	16	35	18	17	28	87	36	123	38	45	83	39	206	5.3
China	15	10	18	17	4.0	18	29	14	43	34	6.0	40	24	83	3.5
Czech Republic	6.0	9.0	12	10	11	17	20	15	35	15	15	30	19	65	3.4
Denmark	23	21	32	19	26	33	44	52	96	41	49	90	38	186	4.9
France	35	24	37	24	26	33	124	47	171	71	61	132	40	303	7.6
Germany	29	20	35	23	25	33	71	47	118	63	65	128	39	246	6.3
Greece	13	13	20	11	13	19	28	22	50	19	27	46	24	96	4.0
India	21	14	24	17	11	20	48	25	73	25	15	40	25	113	4.5
Ireland	21	15	27	13	10	19	38	29	67	37	16	53	29	120	4.1
Italy	40	24	42	20	30	36	106	68	174	39	70	109	45	283	6.3
Japan	19	14	26	17	15	26	32	21	53	32	24	56	35	109	3.1
Luxembourg	15	6.0	15	18	9.0	21	32	7.0	39	29	16	45	24	84	3.5
Mexico	12	12	19	13	11	19	29	25	54	26	17	43	24	97	4.0
Poland	11	16	19	13	9.0	18	16	30	46	21	11	32	22	78	3.5
Portugal	14	13	20	12	10	19	29	29	58	22	20	42	24	100	4.2
South Korea	17	14	22	8.0	9.0	12	38	23	61	22	15	37	24	98	4.1
Spain	20	15	23	18	10	19	60	29	89	33	14	47	27	136	5.0
Turkey	17	11	23	13	14	19	30	23	53	19	49	68	25	121	4.8
United Kingdom	30	18	35	29	22	32	102	35	137	52	49	101	39	238	6.1
United States	26	18	32	16	19	25	100	36	136	38	39	77	35	213	6.1

Source: Tax Policy Reform Database, OECD, IBFD.

Table Appendix E.2. Frequency of Tax Policy Measures

(count of measures)

			Major							Minor							Grand Total
			Base			Rate			Total	Base			Rate			Total	
			Dec	Inc	Total	Dec	Inc	Total		Dec	Inc	Total	Dec	Inc	Total		
Single-year	Not in package	CIT	99	45	144	37	14	51	195	14	6	20	3	8	11	31	226
		PIT	93	36	129	31	17	48	177	13	3	16	8	9	17	33	210
		VAT	20	23	43	32	32	64	107	2	3	5	3	7	10	15	122
		EXE	3	11	14	11	40	51	65	2	3	5	14	31	45	50	115
		SSC	27	21	48	19	30	49	97	19	8	27	20	19	39	66	163
		PRO	7	21	28	4	4	8	36	8	3	11	6	6	12	23	59
		Total	249	157	406	134	137	271	677	58	26	84	54	80	134	218	895
	Package	CIT	213	138	351	111	69	180	531	31	20	51	20	10	30	81	612
		PIT	361	172	533	134	74	208	741	33	15	48	26	9	35	83	824
		VAT	32	37	69	50	68	118	187	4	6	10	11	11	22	32	219
		EXE	6	8	14	9	55	64	78	1	6	7	9	44	53	60	138
		SSC	20	11	31	23	25	48	79	7	10	17	6	27	33	50	129
		PRO	17	14	31	6	5	11	42	6	4	10	5	2	7	17	59
		Total	649	380	1,029	333	296	629	1,658	82	61	143	77	103	180	323	1,981
	Total		898	537	1,435	467	433	900	2,335	140	87	227	131	183	314	541	2,876
Multi-year	Not in package	CIT	10	1	11	16	2	18	29	1	1	2				2	31
		PIT	7		7	5	3	8	15	2		2		1	1	3	18
		VAT	2	1	3	4	4	8	11								11
		EXE	1		1	1	1	2	3				1	1	2	2	5
		SSC	5	1	6	1	8	9	15	2		2	2	4	6	8	23
		PRO	3	1	4		1	1	5	2		2				2	7
		Total	28	4	32	27	19	46	78	7	1	8	3	6	9	17	95
	Package	CIT	45	18	63	57	5	62	125	9	1	10				10	135
		PIT	42	31	73	49	2	51	124	6	2	8	5		5	13	137
		VAT	4	4	8	3	7	10	18								18
		EXE					2	2	2		1	1		3	3	4	6
		SSC		3	3		5	5	8				1	2	3	3	11
		PRO	1		1	1		1	2	2	2	4		1	1	5	7
		Total	92	56	148	110	21	131	279	17	6	23	6	6	12	35	314
	Total		120	60	180	137	40	177	357	24	7	31	9	12	21	52	409
Grand Total			1,018	597	1,615	604	473	1,077	2,692	164	94	258	140	195	335	593	3,285

Source: Tax Policy Reform Database, OECD, IBFD.

Table Appendix E.3. Correlation Among Different Tax Policy Measures in the Sample

			PIT				CIT				VAT				SSC				EXE				PRO			
			Base		Rate		Base		Rate		Base		Rate		Base		Rate		Base		Rate		Base		Rate	
			Dec	Inc	Dec	Inc	Dec	Inc	Dec	Inc	Dec	Inc	Dec	Inc	Dec	Inc	Dec	Inc	Dec	Inc	Dec	Inc	Dec	Inc	Dec	Inc
PIT	Base	Dec	1.00																							
		Inc	0.13	1.00																						
	Rate	Dec	0.38	0.21	1.00																					
		Inc	0.00	0.20	-0.04	1.00																				
CIT	Base	Dec	0.25	-0.01	0.07	0.01	1.00																			
		Inc	0.03	0.34	0.16	0.12	0.13	1.00																		
	Rate	Dec	0.17	0.17	0.30	0.02	0.18	0.24	1.00																	
		Inc	0.08	0.12	0.03	0.43	0.13	0.20	0.10	1.00																
VAT	Base	Dec	0.03	-0.05	0.03	-0.03	0.05	-0.05	-0.03	0.03	1.00															
		Inc	-0.05	0.07	0.00	-0.01	0.01	0.13	0.00	0.01	0.20	1.00														
	Rate	Dec	0.03	0.02	0.08	-0.03	0.04	-0.05	0.07	0.00	0.23	0.00	1.00													
		Inc	0.01	0.07	-0.05	0.13	-0.03	0.02	0.02	0.15	-0.07	0.05	0.05	1.00												
SSC	Base	Dec	0.11	0.01	0.03	-0.03	0.10	-0.04	0.13	-0.01	0.00	-0.06	0.07	0.05	1.00											
		Inc	0.01	0.01	-0.04	-0.01	0.02	0.03	0.01	0.09	-0.02	-0.04	0.03	0.11	0.12	1.00										
	Rate	Dec	0.02	0.06	0.10	-0.01	0.08	0.04	0.08	0.11	0.01	-0.03	0.12	-0.02	0.12	0.14	1.00									
		Inc	0.07	-0.01	-0.03	0.01	0.10	-0.03	-0.01	0.08	0.00	-0.04	-0.02	0.05	0.26	0.25	0.11	1.00								
EXE	Base	Dec	0.10	0.01	0.16	0.02	-0.03	0.05	0.06	0.05	0.12	0.02	-0.02	-0.01	0.09	0.07	0.13	0.01	1.00							
		Inc	0.04	-0.01	0.01	0.00	-0.05	0.07	-0.01	0.10	-0.02	0.00	0.01	-0.05	-0.01	0.15	0.12	0.03	0.12	1.00						
	Rate	Dec	0.06	-0.04	0.04	-0.01	0.06	0.00	0.01	-0.02	0.04	0.00	0.19	0.00	0.00	0.02	0.10	-0.01	0.04	0.05	1.00					
		Inc	0.13	0.10	0.07	0.07	0.01	0.15	0.02	0.20	0.01	0.02	0.00	0.17	0.05	0.17	0.12	0.17	0.13	0.25	0.11	1.00				
PRO	Base	Dec	0.13	0.03	0.08	-0.01	0.14	-0.01	0.04	0.02	0.01	-0.03	0.07	-0.05	0.12	0.01	0.11	0.12	0.00	0.00	0.03	0.09	1.00			
		Inc	0.01	0.08	0.02	0.04	-0.04	0.03	0.00	0.13	-0.02	0.00	0.01	0.00	0.09	0.02	0.03	0.06	0.00	0.07	-0.02	0.08	0.19	1.00		
	Rate	Dec	0.07	0.00	0.10	-0.01	0.11	0.02	0.07	-0.03	0.08	0.03	0.21	-0.03	0.01	0.00	0.04	0.07	0.07	0.03	0.05	-0.01	0.13	0.03	1.00	
		Inc	-0.01	0.08	0.01	0.10	-0.05	0.01	0.09	0.18	0.01	-0.03	0.04	0.15	0.12	0.16	0.02	0.12	-0.02	-0.03	0.02	0.07	0.05	0.20	-0.02	1.00

Source: Tax Policy Reform Database, OECD, IBFD.

Table Appendix E.4. Co-occurrence of Different Tax Policy Measures in the Sample

(in country years)

			PIT				CIT				VAT				SSC				EXE				PRO			
			Base		Rate		Base		Rate		Base		Rate		Base		Rate		Base		Rate		Base		Rate	
			Dec	Inc	Dec	Inc	Dec	Inc	Dec	Inc	Dec	Inc	Dec	Inc	Dec	Inc	Dec	Inc	Dec	Inc	Dec	Inc	Dec	Inc	Dec	Inc
PIT	Base	Dec	295																							
		Inc	83	165																						
	Rate	Dec	117	60	183																					
		Inc	46	45	22	96																				
CIT	Base	Dec	140	62	74	35	258																			
		Inc	79	75	51	31	77	162																		
	Rate	Dec	91	55	84	23	87	63	174																	
		Inc	48	38	30	42	51	41	32	91																
VAT	Base	Dec	25	9	18	5	26	9	14	7	56															
		Inc	22	16	13	9	23	23	15	9	17	65														
	Rate	Dec	33	22	26	9	31	16	24	9	17	9	80													
		Inc	48	34	19	25	37	31	28	27	4	16	18	104												
SSC	Base	Dec	32	14	22	5	29	10	18	7	6	2	10	15	60											
		Inc	21	14	10	5	21	14	11	11	4	2	4	11	8	48										
	Rate	Dec	27	17	19	6	27	14	17	12	5	3	8	7	14	9	55									
		Inc	52	24	26	15	42	25	23	19	7	7	10	20	23	24	17	95								
EXE	Base	Dec	9	4	6	2	4	6	5	3	5	2	1	2	3	3	3	3	13							
		Inc	13	7	6	5	9	6	4	6	2	3	3	2	3	8	4	5	2	27						
	Rate	Dec	22	6	15	5	17	9	10	5	6	5	12	5	2	3	5	5	2	2	37					
		Inc	68	40	37	22	53	41	32	35	13	13	16	32	16	19	15	35	7	13	15	130				
PRO	Base	Dec	24	11	14	5	22	10	16	7	4	3	5	4	8	4	9	12	1	2	3	15	41			
		Inc	17	14	11	7	11	16	10	12	3	5	5	5	5	4	6	6	1	3	2	10	6	37		
	Rate	Dec	11	5	6	2	10	7	10	1	3	3	5	1	2	2	3	4	2	2	2	5	7	2	17	
		Inc	10	8	6	6	6	5	8	9	2	1	3	7	5	5	3	8	0	0	2	6	2	7	0	19

Source: Tax Policy Reform Database, OECD, IBFD.

Table Appendix E.5. Sample Coverage during Economic Recession/Expansions, Consolidations/Normal Times, and Election Cycles

Expansion/Recession

Country	Minimum Year	Maximum Year
Australia	1970	2008
Austria	1973	2001
Brazil	1988	2014
Canada	1971	2008
Czech Republic	1991	2011
Denmark	1970	2007
France	1970	2007
Germany	1970	2007
Greece	1990	2006
India	1988	2011
Ireland	1981	2007
Italy	1970	2007
Japan	1970	1996
Luxembourg	1970	2007
Mexico	1987	2007
Poland	1988	2012
Portugal	1989	2007
South Korea	1970	2011
Spain	1988	2006
Turkey	1985	2014
United Kingdom	1970	2002
United States	1970	2003

Consolidation/Normal times

Country	Minimum Year	Maximum Year
Australia	1985	1997
Austria	1984	2012
Canada	1983	2013
Denmark	1982	2012
France	1979	2014
Germany	1982	2011
Ireland	1983	2011
Italy	1991	2014
Japan	1979	2006
Portugal	2000	2013
Spain	1989	2014
United Kingdom	1979	2013
United States	1978	2011

Pre-/Post-election

Country	Minimum Year	Maximum Year
Australia	1972	2014
Austria	1986	2009
Canada	1972	2012
Czech Republic	1992	2011
Denmark	1973	2011
France	1972	2012
Germany	1973	2009
Greece	1988	2012
Ireland	1988	2011
Italy	1969	2014
Japan	1990	2014
Luxembourg	1973	2005
Poland	1991	2012
Portugal	1986	2011
Spain	1989	2012
United Kingdom	1974	2010
United States	1969	2001

Source: Tax Policy Reform Database, OECD, IBFD.

Table Appendix E.6. Composition of Major Tax Reforms by Tax Type, Type of Change, and Country

(in percent)

		CIT	EXE	PIT	PRO	SSC	VAT
Australia	BASE	82%	25%	59%	100%	30%	64%
	RATE	18%	75%	41%		70%	36%
Austria	BASE	65%		79%	100%		43%
	RATE	35%	100%	21%			57%
Brazil	BASE	80%	50%	78%		50%	78%
	RATE	20%	50%	22%		50%	22%
Canada	BASE	60%	31%	74%		27%	58%
	RATE	40%	69%	26%		73%	42%
China	BASE	53%	25%	40%	40%		58%
	RATE	47%	75%	60%	60%		42%
Czech Republic	BASE	58%		75%		38%	22%
	RATE	42%	100%	25%	100%	63%	78%
Denmark	BASE	63%	20%	70%	33%	44%	54%
	RATE	38%	80%	30%	67%	56%	46%
France	BASE	60%	29%	78%	71%	55%	22%
	RATE	40%	71%	22%	29%	45%	78%
Germany	BASE	61%	31%	65%	75%	31%	25%
	RATE	39%	69%	35%	25%	69%	75%
Greece	BASE	53%		62%			31%
	RATE	47%	100%	38%		100%	69%
India	BASE	65%		71%	100%		81%
	RATE	35%	100%	29%			19%
Ireland	BASE	49%		71%	100%	33%	
	RATE	51%	100%	29%		67%	100%
Italy	BASE	79%	22%	76%	92%	55%	37%
	RATE	21%	78%	24%	8%	45%	63%
Japan	BASE	64%	50%	51%	67%		33%
	RATE	36%	50%	49%	33%	100%	67%
Luxembourg	BASE	50%		59%	100%	50%	18%
	RATE	50%	100%	41%		50%	82%
Mexico	BASE	70%	50%	64%	75%	33%	14%
	RATE	30%	50%	36%	25%	67%	86%
Poland	BASE	65%		68%			40%
	RATE	35%		32%			60%
Portugal	BASE	61%	100%	73%			19%
	RATE	39%		27%	100%	100%	81%
South Korea	BASE	77%	25%	81%	80%		89%
	RATE	23%	75%	19%	20%	100%	11%
Spain	BASE	74%		73%		100%	12%
	RATE	26%		27%			88%
Turkey	BASE	61%	7%	77%	60%	70%	17%
	RATE	39%	93%	23%	40%	30%	83%
United Kingdom	BASE	59%	5%	76%	100%	13%	40%
	RATE	41%	95%	24%		88%	60%
United States	BASE	73%	14%	70%	100%	46%	
	RATE	27%	86%	30%		54%	

Source: Tax Policy Reform Database, OECD, IBFD.

Table Appendix E.7. Composition of Major Tax Reforms by Tax Type, Direction of Change, and Country

(in percent)

		CIT	EXE	PIT	PRO	SSC	VAT
Australia	DEC	62%	75%	72%	100%	40%	55%
	INC	38%	25%	28%		60%	45%
Austria	DEC	48%		68%	50%		43%
	INC	52%	100%	32%	50%		57%
Brazil	DEC	87%		78%		50%	78%
	INC	13%	100%	22%		50%	22%
Canada	DEC	63%	6%	76%		27%	63%
	INC	38%	94%	24%		73%	37%
China	DEC	82%	25%	80%	80%		71%
	INC	18%	75%	20%	20%		29%
Czech Republic	DEC	58%		70%	100%	50%	33%
	INC	42%	100%	30%		50%	67%
Denmark	DEC	48%		60%	67%	56%	23%
	INC	53%	100%	40%	33%	44%	77%
France	DEC	70%	29%	75%	36%	62%	78%
	INC	30%	71%	25%	64%	38%	22%
Germany	DEC	59%	13%	69%	75%	46%	13%
	INC	41%	88%	31%	25%	54%	88%
Greece	DEC	50%	100%	55%			31%
	INC	50%		45%		100%	69%
India	DEC	73%	67%	66%			50%
	INC	27%	33%	34%	100%		50%
Ireland	DEC	66%	50%	66%		33%	50%
	INC	34%	50%	34%	100%	67%	50%
Italy	DEC	67%	22%	59%	25%	60%	16%
	INC	33%	78%	41%	75%	40%	84%
Japan	DEC	67%		66%	56%		17%
	INC	33%	100%	34%	44%	100%	83%
Luxembourg	DEC	88%		78%	100%	83%	64%
	INC	13%	100%	22%		17%	36%
Mexico	DEC	63%	17%	58%	25%	50%	71%
	INC	37%	83%	42%	75%	50%	29%
Poland	DEC	69%		48%			25%
	INC	31%		52%			75%
Portugal	DEC	61%		50%	100%	100%	25%
	INC	39%	100%	50%			75%
South Korea	DEC	77%	25%	78%	20%		56%
	INC	23%	75%	22%	80%	100%	44%
Spain	DEC	79%		67%			59%
	INC	21%		33%		100%	41%
Turkey	DEC	61%	22%	63%		30%	25%
	INC	39%	78%	37%	100%	70%	75%
United Kingdom	DEC	72%	15%	84%	71%	25%	50%
	INC	28%	85%	16%	29%	75%	50%
United States	DEC	76%	43%	82%	100%	23%	
	INC	24%	57%	18%		77%	

Source: Tax Policy Reform Database, OECD, IBFD.