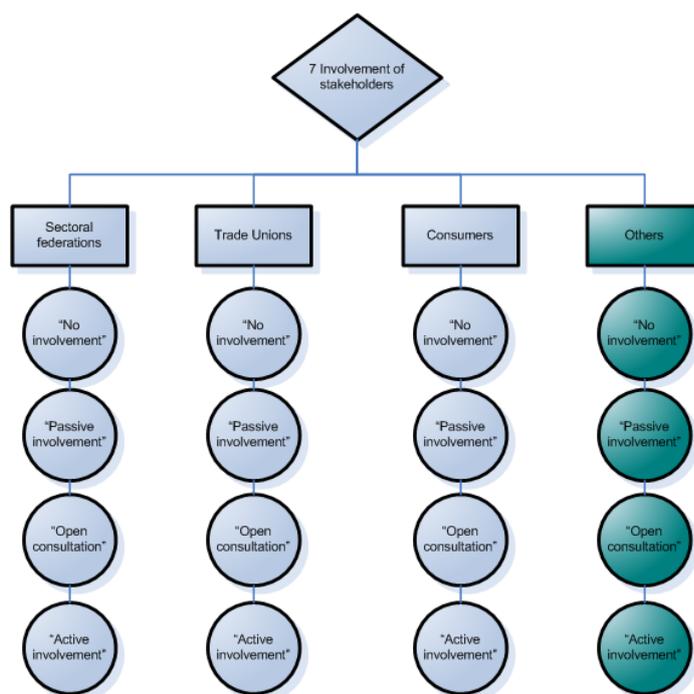




Outline of indicators on microeconomic reforms based on the MICREF database

Dirk Zeitz and Alexander Loschky



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Outline of indicators on microeconomic reforms based on the MICREF database

Dirk Zeitz and Alexander Loschky*

Abstract:

The Lisbon Strategy – an action and development plan for the European Union – originally aimed at making the EU “the most dynamic and competitive knowledge-based economy in the world capable of sustainable economic growth with more and better jobs and greater social cohesion, and respect for the environment by 2010”. It was set out by the European Council in Lisbon in March 2000. After a midterm review in 2005 the Lisbon Strategy was renewed to focus reform efforts on two principal tasks – delivering stronger, lasting growth and creating more and better jobs.

In order to track the reform efforts in the framework of the (renewed) Lisbon Strategy the MICREF database was created. The Joint Research Centre (JRC Ispra) supported Directorate General Economic and Financial Affairs (DG ECFIN) and Directorate General Enterprise and Industry (DG ENTR) in the creation and the filling of the database and developed analytical tools based on the data contained in the MICREF database. The objective of these tools is to support the investigation of the reform activity and the reform characteristics in the microeconomic area. The indicators proposed in the present report are mostly based on the descriptive features of the database and try to shed light on reform characteristics such as the speed of implementation, the involvement of stakeholders or monitoring procedures.

Keywords: Structural reforms, EU, indicators, political economy of reform processes, Lisbon Strategy.

* We thank Ms. Michela Nardo for her very helpful comments.

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1 Introduction

The Lisbon Strategy – an action and development plan for the European Union – originally aimed at making the EU “the most dynamic and competitive knowledge-based economy in the world capable of sustainable economic growth with more and better jobs and greater social cohesion, and respect for the environment by 2010”. It was set out by the European Council in Lisbon in March 2000. After a midterm review in 2005 the Lisbon Strategy was renewed to focus reform efforts on two principal tasks – delivering stronger, lasting growth and creating more and better jobs.

In order to track the reform efforts in the framework of the (renewed) Lisbon Strategy the MICREF database was created which collects data on microeconomic structural reforms undertaken by Member States in the context of the Lisbon Strategy around the broad themes open and competitive markets, business environment and entrepreneurship, and knowledge based economy.¹ The JRC Ispra supported DG ECFIN and DG ENTR in the creation and the filling of the database and also developed analytical tools based on the data contained in the MICREF database.

While the importance of microeconomic reforms is indisputable, little is known about the preferred strategies of countries within the microeconomic area (reforms in the areas product markets, business environment and the knowledge based economy). The recent literature is constrained by the availability of data on structural reforms. Furthermore, we do not know much about the characteristics of reforms in the microeconomic area. Therefore, the objective of the tools developed by the JRC is to support the investigation of the reform activity and the reform characteristics in the microeconomic area.

We base our investigation on the database on microeconomic reforms (MICREF) which was developed by the European Commission since 2006 and was made partly available to the public end of July 2008. Currently² the public database covers 1289 reform measures mainly for the period 2004-2006. For some Member States of the EU-15 also data for the period 2000-2003 is publicly available. Each reform is characterised by a set of descriptive features which addresses important features of the reform design.

The present report describes how the data provided by the MICREF database can be investigated using a set of indicators. This involves also an exploration of the data.

It is important to underline that the indicators described in the present report should not be seen as tools to measure a country’s economic performance. The indicators do not per se assess the reform quality but they are measures to summarise the observations made and to compare them across the dimension chosen for the assessment (e.g. against the EU average).

The document is structured as follows; section 2 describes the design of the MICREF database, section 3 introduces the general methodological framework used in the

¹ The database can be accessed via http://ec.europa.eu/economy_finance/db_indicators/db_indicators10938_en.htm

² End of July 2009.

development of the indicators, section 4 discusses the indicators proposed, and section 5 concludes.

2 Architecture of the MICREF database

MICREF is a descriptive database that supplies information on measures affecting product markets and reforms in the area of the knowledge-based economy in the EU-27.

The database is thematically organized around three major policy domains: i) *open and competitive markets*; ii) *business environment and entrepreneurship*; and iii) *knowledge based economy*. These policy domains correspond to *seven broad policy fields*: 1) market integration; 2) competition policy; 3) sector-specific regulation; 4) start-up conditions; 5) business environment; 6) R&D and innovation; and 7) education. Each broad policy field is subdivided into *areas of policy intervention* (31 areas in total) which are in turn subdivided into *reform areas* (117 in total). In the following we use the term “areas of reform” if we refer to the hierarchical structure of the MICREF database.

MICREF provides information on the characteristics of each reform. The following 12 descriptive features exist:

Box 1 The descriptive features of MICREF

1.	General description
2.	Reference (law / budget law / decree / other)
3.	Source of information (e.g. National Reform Programme)
4.	Date of adoption of the measure (DD/MM/YYYY)
5.	Date of implementation of the measure (DD/MM/YYYY)
6.	Budgetary impact on
	a) Revenue (positive / negative / no / unknown)
	aa) Absolute amount
	ab) Starting year
	ac) End year
	b) Expenditure (positive / negative / no / unknown)
	ba) Absolute amount
	bb) Starting year
	bc) End year
7.	Involvement of major stakeholders
	a) Sectoral federations (active involvement / open consultation / passive involvement / no involvement)
	b) Trade unions (active involvement / open consultation / passive involvement / no involvement)
	c) Consumers (active involvement / open consultation / passive involvement / no involvement)
	d) Others (active involvement / open consultation / passive involvement / no involvement)
8.	Is the measure part of a reform package? (yes / no)
	a) How many policy domains are affected by the reform package ? (1 to 5)
	b) Which is the main policy domain affected? (open and competitive markets / business environment and entrepreneurship / knowledge based economy / labour markets / capital markets)
9.	Monitoring
	a) Are monitoring procedures put in place? (yes / no)
	aa) Monitoring body (independent / other)
	ab) How frequent does monitoring take place? (quarterly / yearly / biannually / irregularly)
10.	Evaluation
	a) Are evaluating procedures put in place? (yes / no)
	aa) Evaluating body (independent / other)
11.	Main impact (channel) of the reform measure (more than one can be ticked: entry/exit / direct costs of doing business / increase of public/private R&D / innovation capacity / productivity / mark ups)
12.	Economic importance of the sector (high / medium / low)

Under the heading “mandatory features” (indicated in bold in Box 1), factual information is collected on the general characteristics of the measure enacted. Hereunder, the database provides a general description of the provisions contained in the enacted measure, the reference to the information source concretely used to fill the database, and the date of adoption.

The non-mandatory features aim at providing detailed information on the design of the reform.

3 Methodology for the development of indicators

For the development of indicators using the MICREF database we had in mind the following guiding principles:

1. The indicator should provide a value added compared to the use of descriptive statistics for the assessment of the data

Not in all cases is it necessary to summarise information using an indicator. Often the information can be delivered in an equally convincing and informative way by descriptive statistics. This happens, e.g. when a descriptive feature provides only ‘yes’ / ‘no’ answers. When the descriptive features include more than one characteristic of the phenomenon under study, then the use of indicators is justified. An indicator, in fact, could bring additional insights about the properties of a given reform when condensing the information in a clear and transparent way.

2. The indicator should convince from a conceptual point of view

Overall, not only the concept has to be transparent and open to scrutiny, but also the comparability of the indicator across different dimensions (across countries, across time or across reform areas) should be ensured. Consequently, the design of the indicator should not be influenced by country-, time- or area-specific factors.

If different descriptive features related to the same phenomenon cannot be combined in a convincing manner, the development of an indicator could be subject to criticism. Also, when there are well-grounded doubts that the parts of the questionnaire covering the reform characteristic under study are not understood in the same way by different data compilers, and, what is even more important, by the 27 Member States during the verification procedure, the development of an indicator is not recommended.

3. Different ways to compose the indicators should be described and discussed

Often, there are different alternatives for developing an indicator, in particular if the underlying data sources are categorical. In order to choose the most suitable options, it is important to mention alternative ways in which features can be combined and to explicitly justify the choices made.

3.1 Common approach in the development of MICREF indicators

In developing indicators from the MICREF database a common approach was followed. The data elements used were assessed, non-numerical descriptive features were transformed into numerical values, and the issue of missing data was addressed. After the calculation of the indicator values these were aggregated along one or several of the dimensions “area of reform”, “Member States”, or over time.

3.1.1 Data elements used

In the MICREF database two different types of information are available as inputs for the indicator development.

The first type is based on the *reform activity* (e.g. the number of reforms undertaken in a specific reform area) whereas the second is based on the *reform characteristics* (derived from the answers determining the properties of a reform). For both types of data elements the comparability of the descriptive features across countries, policy fields and time is crucial. This means that the same conception of a significant reform measure to be recorded in the database between countries is applied.

Data referring to the *reform activity* are already available in numerical form so they can be immediately used for indicator development. Data elements referring to the *reform characteristics* are the product of an assessment of the descriptive features and the data. The categorical data have to be transformed into numerical values and several assumptions have to be made (which can have an influence on the indicator values).

3.1.2 Transformation into numerical values

The attributes that describe the properties of a reform measure are predominantly categorical variables (see Box 1). In order to condense the reform characteristics into a single number – usable to assess the properties of the reform process – the attribute values have to be transformed into numerical values. With the intention of assuring a uniform approach in all indicators, numerical values in a range between 0 and 1 are assigned (except for the indicator on *speed of implementation* where the values are expressed in months).

The transformation should be driven by theoretical considerations on the “value” of a specific reform characteristic, i.e. an order of the possible options has to be established according to some criteria. A particular order is not always explicitly inherent in the answers, i.e. it is not always clear which option is to be ranked higher than the other.

When there is no straightforward order, we discuss the different options and propose a solution. This step of the indicator development can be highly subjective and the assignment of numerical values can be modified without altering the general set-up of the indicator. If other values are chosen the results of the indicator and also the conclusions of the interpretation are affected.

3.1.3 Treatment of missing data

Some attributes used as input factors for the indicators show a large amount of missing data even though theoretically a completion rate of 100% of the descriptive feature in question could be expected.³ This would require that the data compiler was able to find all relevant information or that the Member States complemented the missing data during the verification phase. However, this is often not the case.

Therefore, the treatment of missing data has to be addressed during the development process of the indicators. If descriptive features (or its subsequent attributes) show missing data (missing attribute values) different methods can be applied to tackle this imperfection:

- a. Case deletion: eliminate the measures where the attribute value needed for the calculation of the indicator is missing.
- b. Exact Imputation: The missing attribute values can be retrieved using statistical methods, e.g. attributing the expected value.
- c. Interval imputation: When an attribute value is missing it can be replaced with an interval covering all possible values for the data item.

Only those measures for which the essential attribute value needed for the calculation of the indicator is completed are used. Other measures are not considered (method a).

If at least one attribute needed for the calculation of the indicator is completed then the other attributes with missing data are substituted with intervals covering the possible range of values (method c.).⁴ Consequently, if at least one attribute value is missing, then two different indicator values are calculated for the measure, a minimum and a maximum value. As a result after aggregating the entire group of the reforms under consideration will also show a minimum and a maximum indicator value. The “real” indicator value lies somewhere in this interval. Where exactly is unknown until all missing attribute values are filled-in with real data. The more data is missing the wider the interval becomes within the boundaries of the theoretical reachable values.

Notice that the provision of a point value (e.g. the average 0.5⁵) could give the incentive to Member States having an actual value lower than the average not to complete the feature (without completing the feature they would always have at least the average). This would mean that the lower bound of the scale (0) would never be reached, thereby modifying the entire statistical distribution (and properties) of the sample. Furthermore

³ Only the descriptive feature “Economic importance” shows by design completion rates below 100% because it has to be completed only for measures under the policy field “sector specific regulation”.

⁴ E.g. in order to obtain an indicator value for monitoring, it is essential that at least the question whether monitoring procedures are put in place is answered (9.a). If no information is provided on the subsequent attributes (monitoring body and/or frequency) then for those attributes the interval imputation is applied.

⁵ If an interval imputation was applied one might calculate the arithmetic average of the minimum and maximum indicator values. For descriptive features with “yes” (1.0), “no”(0.0) answers this would lead to an indicator value of 0.5.

the average value is not foreseen in the set of potential answers to a specific descriptive feature.

The Annex contains for each indicator for which the interval imputation was applied a table of values only for those measures with fully completed information. This corresponds to method a (case deletion).

Table 1 Number of indicator values with and without imputation

Indicator	only fully completed database	with interval imputation	Relative increase in the number of indicators
Speed of implementation	245	322	31.43%
Involvement of stakeholders (3 stakeholders)	174	239	37.36%
Indicator on monitoring	165	285	72.73%
Indicator on evaluation	156	169	8.33%
Indicator on comprehensiveness	131	255	94.66%

Table 1 shows that the number of measures for which an indicator can be calculated can be strongly increased by the application of the interval imputation.

3.1.4 Aggregation

The design of the MICREF database allows for the analysis of reform characteristics (descriptive feature of an indicator) across *three dimensions*:

1. Area of reform
2. Member States
3. Over time.

The indicator values are calculated on the level of the individual reform measures (for those measures where sufficient data are available). Then the measures are aggregated along the dimension under study by calculating an arithmetic average of the individual indicator values. Consequently, an indicator value calculated for a specific country is the average across all measures in this country, not taking into account the attribution of reform measures to specific policy fields.

4 Indicators

This section presents a discussion of proposed indicators mainly based on the descriptive features of the database. Overall seven indicators are presented in this section. For each indicator the concept and the assumptions are discussed and a concrete example is provided.

The data source used is the information available in the public database at the end of July 2009. Data are referred to the 27 Member States and to the seven broad policy fields.

Data availability currently prevents further disaggregation of the indicators (e.g. along the time dimension).

On the most disaggregated level an indicator could be calculated for each Member State in a particular year and a specific reform area. Currently for each indicator based on the descriptive features a maximum of 28431 values could be obtained (9 reference years, 27 Member States, and 117 reform areas). However, the MICREF database contains only 1289 reform measures that can be exploited to calculate indicators. Due to the low coverage of the descriptive features, the number of measures for which the indicators can actually be calculated is even much lower.

The potential indicators developed based on the database focus on two aspects of microeconomic reforms

- the reform activity (e.g. the number or the share of reforms undertaken in a specific area of reform or year), and
- the reform characteristics (derived from the properties of a reform).

For both types of data indicators were developed that condense the information contained in the database.

4.1 Indicators on the reform activity

One output given by the MICREF database is the **number of reforms** adopted by each Member State classified along the hierarchical structure (areas of reform) of the database described in section 2. Comparing the number of measures across Member States and over time would require reform measures of roughly the same order of magnitude, both within and across Member States, and within and across areas of reform. This is not necessarily fulfilled. Even though the number of reforms may not be a good indicator for a comparison across Member States as it might be biased by various factors⁶, it allows us to draw conclusions about the preferences set by the countries regarding their reform activity.

The **share of reforms** undertaken in a particular policy field within a Member State can correct the strong differences between Member States in the number of reported reforms. The share of reforms can be obtained by dividing the number of reforms in a particular area of reform for a specific Member States by the total number of all reforms of the same Member State (or a group of countries if the group is under study). The shares for each area of reform in a particular Member State, define the ‘reform profile’ of that country. Comparing the share of reforms across countries only presupposes that reform measures can be attributed unequivocally to specific areas of reform and the attribution of reform measures does not differ between countries.

The number and share of reforms, however, should not be considered as performance indicator. Neither the number nor the share of reforms allow drawing conclusions on

⁶ E.g. the scope of the documents used for the data collection, different perceptions of a reform measure by the compiler, the degree of participation of the Member State in the verification process, etc..

whether the policies undertaken by Member States are appropriate, they only allow a portrait of the microeconomic reforms carried out by Member States.

As of July 2009 the reforms in the database completely cover the period 2004-2006 for the EU-25. Even though also reform measures for Bulgaria and Romania were collected, there are differences in the considered information sources as compared to other Member States. Moreover, for a few but not all Member States data were already published for the period 2000-2003. For this reason the analysis directly or indirectly made based on the number of reforms is limited to the period 2004-2006 for the EU-25.

4.1.1 The indicator on revealed preferences - RP

The idea of the indicator “revealed preference” is to measure the deviation of the reform profile of one particular Member State from a reference reform profile (e.g. EU, new MS). It is the only indicator that is not based on the properties of the reform process (*reform characteristics*), but provides an indication for the *reform activity* across Member States.

A possible approach to measure the preferences of Member States is the computation of the square root of the sum of the weighted squared differences of a particular Member State ‘j’ versus the EU shares. The indicator on revealed preferences (RP) for Member State ‘j’ can be computed as

$$RP_j = \sqrt{\sum_i^I (x_{i,j} - x_{i,EU})^2 \omega_i} ;$$

with $x_{i,j}$ as the share of measures carried out in area of reform ‘i’ in the Member State ‘j’, $x_{i,EU}$ as the share of measures carried out in area of reform ‘i’ for the entire EU or any alternative reference profile. If a Member State has an identical reform profile to the reference profile the value for the indicator on the revealed preference would be 0.00%.

As an option each deviation from the reference point can be weighted with ω_i . The choice whether the weight ω_i is used depends on analytical considerations. In the following we consider two approaches for ω_i . It is determined by the MICREF hierarchy of areas of reform in one case and by the EU share observable for the particular area of reform in the other case.

Hence,

$$\omega_i = \left\{ \begin{array}{l} \text{a) } '1/I', \text{ where 'I' presents the total number of} \\ \text{areas of reform derived from the hierarchical} \\ \text{structure of the MICREF database (1/3 [broad} \\ \text{policy areas]; 1/7 [policy fields], 1/31 [areas} \\ \text{of policy interventions; 1/117 [reform areas]),} \\ \text{or} \\ \text{b) } x_{i,EU} . \end{array} \right.$$

Either the same weight for each area of reform⁷ is assigned (a) or the weight is based on the share the EU as a hypothetical country shows for the areas of reforms (b). If option (b) is chosen as a consequence the deviations from the EU profiles have for those areas of reform a higher weight that show a share for the entire EU larger than 1/7.

The following example with two policy fields but different weights applied in indicator RP may further clarify the differences of the two approaches. While the weight chosen according to the hierarchical structure of the MICREF database is constant over time, a weight referring to the EU can be subject to changes in the dataset if the reference profile differs (for instance if another reference period is taken).

	Policy field A	Policy field B	Indicator RP
Deviation in percentage points	-5%	+5%	
Weights according to policy fields	1/2	1/2	0.00%
Weights according to the number of measures	1/3	2/3	+1.67%

In the case where the policy fields are equally weighted, we obtain an indicator value of ‘0.00%’. In the other case in which e.g. the EU share determines the weights, we observe a value of ‘+1.67%’.

The following table contains the indicator values obtained based on the calculation for both approaches for the period 2004-2006 and the EU-25.⁸

Table 2 Indicator on revealed preferences based on ω_i

Member State	MICREF structure	Member State	EU-reference
EE	11.28%	NL	14.91%
NL	11.25%	EE	12.85%
UK	9.25%	UK	10.59%
EL	8.60%	DE	10.27%
DE	8.51%	PT	9.76%

⁷ “Area of reform” is a term used to indicate that it is referred to the 4 hierarchical levels of the MICREF database.

⁸ Bulgaria and Romania were excluded, as the data currently available is based on different information sources than for the other Member States. Due to their accession in 2007 the Implementation Reports submitted by both Member States differ in terms of coverage from the ones of other Member States. The total number of measures considered is 948.

PT	8.46%	EL	9.64%
FI	7.74%	IT	9.17%
IT	6.88%	FI	9.12%
PL	6.85%	DK	7.95%
AT	6.73%	AT	7.39%
DK	6.70%	CY	7.21%
CY	6.54%	FR	7.03%
CZ	6.40%	SE	7.01%
LU	6.32%	PL	6.97%
FR	6.18%	LU	6.62%
SE	6.06%	CZ	6.62%
LT	5.77%	LV	6.50%
LV	5.53%	BE	6.30%
BE	5.50%	IE	5.75%
SI	5.32%	LT	5.64%
MT	5.25%	SI	5.53%
IE	4.79%	HU	5.44%
HU	4.59%	ES	5.43%
ES	4.43%	MT	5.11%
SK	4.18%	SK	4.15%

Comparing the results applying a different ω_i , relatively small differences can be observed. On average one can see slightly larger values if the EU-share is taken as weight. Moreover, for some countries the rank changes but never more than five positions (as in the case of Poland (PL)). The indicator thus would suggest that the reform patterns of Estonia (EE) and Netherlands (NL) are the most divergent from the EU reform profile, whereas Hungary (HU), Spain (ES) and Slovakia (SK) are very close to the average EU profile.

4.2 Indicators on the reform characteristics

The MICREF database currently covers 1289 that can be exploited for the investigation of reform measures. The number of measures for which data on a descriptive feature is provided, however, is often much lower.

Since the issue of relying on a dataset which has been systematically collected does not play the most important role for the investigation of reform characteristics, we consider the fully available public dataset. For the sake of transparency the number of reform measures used for the aggregation along a policy field and Member State is provided so as to allow the reader a judgment of the representativeness of the shown results. Most indicators proposed in this section are based on the non-mandatory features of the MICREF database. For this reason the rate of data completion is low and the results presented for the indicators are not representative for all microeconomic reforms stored in the database.

As a consequence we show the results obtained only on the “Member State x policy field level” and discourage a further disaggregation for instance by year or along the areas of reform (towards reform area). Moreover, a higher level of disaggregation could hardly be clearly represented in tables.

4.2.1 Indicator on speed of implementation

The descriptive features “Date of adoption” and “Date of implementation” provide the dates when a reform measure was adopted and when it was implemented or entered into force. The two dates can be used to calculate the time elapsed between the measure's adoption and its implementation.

Taking the difference between the dates with the number of days as the measurement unit requires the full dates (DD/MM/YYYY) for both adoption and implementation. In the ideal case the two dates would be available for all measures. However, in the current dataset this is only fulfilled for a rather small number of reforms (245 measures out of 1289).

Table 3 Number of indicators on speed of implementation depending on the measurement unit used

Measurement unit used for the indicator	Number of indicator values	in % of the total number of reform measures	Minimum indicator value	Maximum indicator value
Days	245	15.4%	-130	892
Months	329	20.5%	-4.3	29.7

In order to overcome this limitation, one possibility is to take the number of months elapsed between adoption and implementation. This leads to a higher number of reform measures exploitable (329) for the indicator (Table 3), but the fact that a measure can be adopted early or late in a certain month is neglected, and this may affect the accuracy of the indicator.

In particular, in a case where a measure has been adopted the last day of a month and implemented the first day of the following month, the speed of implementation would appear as one month, whereas the actual time elapsed is only one day. On the other hand, a measure that is adopted on the first day of the month and implemented on the last day of the same month would show a speed of implementation of zero months while the effective time elapsed would be almost one month. This means that in cases where only data on months of adoption and implementation is available the speed of implementation cannot be determined exactly: e.g. if a measure is adopted one month and implemented the next, the time elapsed between adoption and implementation lies therefore in an interval of a minimum one day to a maximum of two months.

Another assumption needed for the development of an indicator is that the adoption should always precede the implementation of the reform measure. This is not the case for

measures that were implemented retroactively.⁹ This assumption is necessary because otherwise the indicator could also reach negative values or the retroactive measure would at least distort an aggregated indicator. There are two ways to solve this problem. Either those measures that were implemented retroactively are dropped or the implementation date is set to the same date of the adoption. In the example below we have dropped the retroactive measures.

The algorithm used for these computations works as follows.

- Retroactive measures are dropped.¹⁰
- If the **full dates** are available the speed of implementation is calculated on the number of days between implementation and adoption of a reform, and the results are expressed in months.

If **DD/MM/YYYY** fully available for both, adoption and implementation $\left\{ \begin{array}{l} \text{DD/MM/YYYY (adop.)} - \text{DD/MM/YYYY (impl.)} \end{array} \right.$

- In cases in **which only one exact date** (either of adoption or implementation) is given we consider this exact day, and we assume a minimum and a maximum scenario for the other date using the first and last days of the month provided (e.g. 1st or 31st of March).

If **DD/MM/YYYY** fully available for adoption $\left\{ \begin{array}{l} \text{MIN: FD/MM/YYYY} - \text{DD/MM/YYYY} \\ \text{MAX: LD/MM/YYYY} - \text{DD/MM/YYYY} \end{array} \right.$

If **DD/MM/YYYY** fully available for implementation $\left\{ \begin{array}{l} \text{MIN: DD/MM/YYYY} - \text{LD/MM/YYYY} \\ \text{MAX: DD/MM/YYYY} - \text{FD/MM/YYYY} \end{array} \right.$

FD and LD represent the first day and the last day of that month in which the measure was adopted and/or implemented.

- The interval is widened if for both dates **only the months** are known.

If **??/MM/YYYY** available for adoption and implementation $\left\{ \begin{array}{l} \text{MIN: FD/MM/YYYY} - \text{LD/MM/YYYY} \\ \text{MAX: LD/MM/YYYY} - \text{FD/MM/YYYY} \end{array} \right.$

Table 4 contains the results for this approach. In the table red flag the values that were above the EU average (implementation took longer) for a specific policy field, while values below the EU average are indicated in green (implementation was faster). This colour scale applies as well to the other indicators shown even though for those a higher

⁹ There are four measures for which the exact dates were known that were implemented retroactively and further 3 measures for which only the months are known were also implemented retroactively. Those measures were not considered in the indicator.

¹⁰ Since only 2% of the measures were introduced retroactively, we assumed in the simulation that implementation occurs always after adoption and excluded the retroactive measure from the calculation.

than average indicator value is usually considered as “better” than the EU-average (i.e. green) for a particular policy field.

Low rate of data completion can be observed; in fact for most entries the indicator value presented for a Member State in a given policy field is only based on a single datum for one measure. When more than one datum is available for a given field and/or country the arithmetic average is taken.

Table 4 Indicator on speed of implementation in months by Member States and policy field¹¹

	Market integration		Competition Policy		Sector specific regulation		Start-up conditions		Improving the (small) business environment		R&D and Innovation		Education		Total		
	Min	Max	Min	Max	Min	Max	Min	Max	Min	Max	Min	Max	Min	Max	Min	Max	
AT	Indicator value	0.03	0.03			5.34	5.94			10.37	10.37	4.07	4.07			5.73	6.06
	Number of reforms	1				5				2		1				9	
BE	Indicator value					10.24	10.58			2.07	3.07	6.20	6.20			7.53	7.87
	Number of reforms					3				1		2				6	
BG	Indicator value					2.72	2.72			8.70	8.70	4.00	4.00			6.32	6.32
	Number of reforms					2				4		1				7	
CY	Indicator value	0.02	0.52	5.38	5.38			5.33	5.33	2.31	2.91	2.85	3.65	25.40	27.40	4.27	4.86
	Number of reforms	2		2				2		5		5		1		17	
CZ	Indicator value	2.30	2.30	1.65	1.65	4.40	4.65	8.27	8.27	7.78	8.44	0.49	0.82	1.73	1.73	4.27	4.49
	Number of reforms	2		2		4		3		3		3		1		18	
DE	Indicator value	0.20	0.20	1.77	1.77	0.13	0.13	1.24	1.91	3.38	3.38	6.09	6.34			2.37	2.48
	Number of reforms	1		3		7		3		8		4				26	
DK	Indicator value	3.53	3.53	0.78	1.28	7.72	7.72					0.30	1.30	2.07	3.07	3.83	4.20
	Number of reforms	1		2		3						1		1		8	
EE	Indicator value							1.22	1.22					0.00	0.00	0.81	0.81
	Number of reforms							2						1		3	
EL	Indicator value					7.37	7.71			7.87	9.37	3.36	4.11	23.23	24.23	7.41	7.99
	Number of reforms					12				2		4		1		19	
ES	Indicator value	0.12	0.12	0.05	0.05	4.93	4.93	4.89	4.89	4.15	4.35	0.60	0.60	0.38	0.38	3.46	3.49
	Number of reforms	2		2		11		4		5		2		2		28	
FI	Indicator value	4.63	4.63							4.93	4.93					4.78	4.78
	Number of reforms	1								1						2	
FR	Indicator value			4.70	4.70	2.83	2.83	5.30	5.30	13.50	13.50	9.67	10.67	3.07	4.07	5.65	6.15
	Number of reforms			1		1		1		1		1		3		9	
HU	Indicator value							6.13	8.13					10.80	11.30	9.24	10.24
	Number of reforms							1						2		3	
IE	Indicator value	0.00	0.00	0.21	0.21	6.08	6.64	7.47	8.47	0.78	1.09	21.33	23.33			4.11	4.57
	Number of reforms	1		3		6		1		5		1				17	
IT	Indicator value	0.00	1.00	0.23	0.23	4.59	4.59	18.43	18.43	0.66	0.66	1.84	1.84	3.10	3.10	2.88	2.92
	Number of reforms	1		1		5		1		4		10		3		25	
LT	Indicator value	1.33	1.33			0.30	0.30	4.00	5.00			0.53	0.53	11.20	11.20	2.94	3.11
	Number of reforms	1				2		1				1		1		6	
LU	Indicator value																
	Number of reforms																
LV	Indicator value	0.94	0.94	0.00	0.00	3.81	3.81	2.23	3.23	0.53	0.53	6.79	6.79	3.16	3.16	3.27	3.36
	Number of reforms	4		1		4		2		3		6		3		23	
MT	Indicator value	7.33	7.33			0.00	0.00			0.00	0.00	4.13	4.13			2.87	2.87
	Number of reforms	1				1				1		1				4	
NL	Indicator value									7.40	7.40	0.25	1.25	6.07	8.07	3.49	4.49
	Number of reforms									1		2		1		4	
PL	Indicator value	2.27	2.27	1.77	1.77	1.86	1.86	1.50	1.50	2.77	2.77	8.03	8.20			3.57	3.61
	Number of reforms	5		1		6		2		5		6				25	
PT	Indicator value			0.00	0.43	8.33	9.33					0.00	1.00			5.00	5.89
	Number of reforms			1		3						1				5	
RO	Indicator value									5.13	6.13	3.90	3.90			4.52	5.02
	Number of reforms									1		1				2	
SE	Indicator value					2.31	2.91			0.27	0.77	2.00	4.00	8.13	10.13	2.47	3.36
	Number of reforms					5				2		1		1		9	
SI	Indicator value	3.25	4.25			2.90	3.40			0.93	0.93	5.31	5.51	7.23	7.23	4.27	4.64
	Number of reforms	2				2				1		5		1		11	
SK	Indicator value	1.44	1.78			3.57	3.57	7.62	7.87	4.11	4.11	2.10	2.35			3.90	4.05
	Number of reforms	3				4		4		5		4				20	
UK	Indicator value	0.00	1.00	0.00	0.00	9.18	10.84	0.00	0.33	1.26	2.26	0.00	1.00	12.72	14.22	3.41	4.41
	Number of reforms	1		1		3		3		4		3		2		17	
Total	Indicator value	1.65	1.86	1.42	1.49	4.73	5.00	4.68	5.02	3.69	3.96	3.94	4.30	6.70	7.33	4.02	4.32
	Number of reforms	29		20		89		30		64		66		24		322	

Values between 0.0 and just below 1.0 for a reform in a specific broad policy field indicate an implementation of the reform within one month after its adoption. As a consequence of the approach just described, Table 4 provides an average minimum and

¹¹ Please note that the values provided in the “total” column are the mean values over all measures in one particular country, not the mean over the values for a particular policy field.

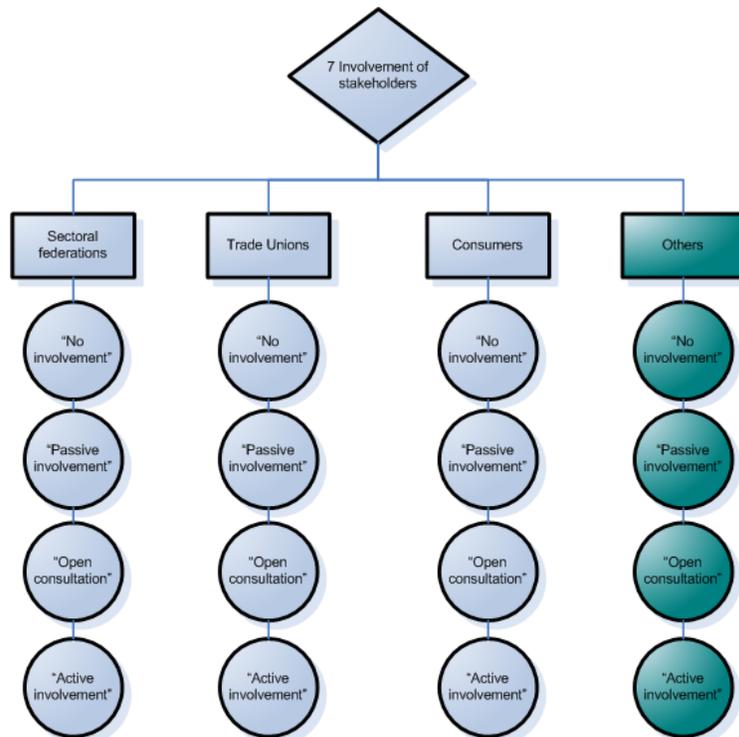
maximum indicator value reflecting the different assumptions about the exact dates of the day of adoption and the day of implementation. In order to increase the number of indicators the method using intervals could also be applied to these cases where only the year of implementation and adoption is known. This, however, would widen considerably the distance between the minimum and the maximum value, making the interpretation of the results difficult.

4.2.2 Indicator on involvement of stakeholders

The quality of relations among and between social partners and the policy makers may help in building the necessary trust to gain the consensus for a specific reform. The involvement of social partners in the reform design is relevant for an informed judgment on the feasibility of a reform. A reform may be carried out through governmental action solely, governmental action with social partners' consultations, tripartite agreement (government and social partners) or social partners' agreement.

The descriptive feature number 7 specifies the stakeholders that participated in the establishment of the reform measure and determines the type of involvement. The compiler can choose from four different stakeholders ('Sectoral federations', 'Trade unions', 'Consumers' and 'Other') and can select from four different types of involvement ('No involvement', 'Passive involvement', 'Open consultation', and 'Active involvement').

Figure 1 Structure of the descriptive feature on the involvement of stakeholders



The measurement of the degree of involvement is based on the “type of involvement” and the “number” of stakeholders. Several options are available to compute the indicator on involvement. The option finally chosen depends on the assumptions

- a) whether all stakeholders should be treated equally (e.g. across policy areas), and
- b) whether missing information should be penalised.

The choices made in relation to these two questions largely determine the indicator. As far as the type of stakeholders’ involvement is concerned the suggested scale is:

Active involvement > Open consultation > Passive involvement > No involvement
 (“>” meaning better)

One possibility to transform this information into quantitative measures is to assume that the “distance” between the different types of involvement is equal.¹²

$$\text{inv}_i = \begin{cases} 1.0 & \text{if the stakeholder } i \text{ is “actively involved”} \\ 0.\bar{6} & \text{if the stakeholder } i \text{ is “openly consulted”} \\ 0.\bar{3} & \text{if the stakeholder } i \text{ is “passively involved”} \\ 0.0 & \text{if the stakeholder } i \text{ is “not involved”} \\ 0.0 \text{ or } 1.0 & \text{if no information on stakeholder involvement} \\ & \text{is available} \end{cases}$$

The development of an indicator on involvement requires some assumptions on the relevance of stakeholders. Are ‘Sectoral federations’, ‘Trade unions’ and ‘Consumers’ the stakeholders that should be involved for each reform or not? To what extent should ‘other stakeholders’ be considered?

The answers to these questions depend on the policy field and on the institutional framework of the Member State considered. It could be argued that the stakeholders concerned by the measures may be those involved in the decision process of a particular reform. This is however, not totally correct since in some countries specific stakeholders have (by law) to be consulted. Although a differentiation in the indicator along the policy fields is possible, we do not have evidence based on the current content of the MICREF database that would justify this differentiation. Furthermore, the differentiation across policy fields would unnecessarily complicate the calculation of the indicator.

¹² Alternatively, experts could be asked to allocate point values or even specific intervals for each option on a [0,1] scale. However, even if points were based on experts’ opinions the result would remain subjective, thus for the sake of transparency and simplicity the equal distances approach was retained.

Table 5 Involvement patterns of different stakeholders

		Market integration	Competition policy	Sector specific regulation	Start-up conditions	Improving the (small) business environment	R&D and Innovation	Education	over all policy fields
Sectoral federations									
No involvement	Number of reforms	5	4	11	0	11	6	8	45
	Percentage	31.3%	36.4%	24.4%	0.0%	20.8%	8.7%	42.1%	19.7%
Passive involvement	Number of reforms	2	0	0	5	9	11	1	28
	Percentage	12.5%	0.0%	0.0%	31.3%	17.0%	15.9%	5.3%	12.2%
Open consultation	Number of reforms	5	4	14	5	8	14	1	51
	Percentage	31.3%	36.4%	31.1%	31.3%	15.1%	20.3%	5.3%	22.3%
Active involvement	Number of reforms	4	3	20	6	25	38	9	105
	Percentage	25.0%	27.3%	44.4%	37.5%	47.2%	55.1%	47.4%	45.9%
Total	Number of reforms	16	11	45	16	53	69	19	229
	Percentage	100.0%	100.0%	100.0%	100.0%	100.0%	100.0%	100.0%	100.0%
Trade Unions									
No involvement	Number of reforms	8	3	17	10	22	27	8	95
	Percentage	50.0%	42.9%	41.5%	58.8%	48.9%	51.9%	50.0%	49.0%
Passive involvement	Number of reforms	1	0	1	0	4	6	1	13
	Percentage	6.3%	0.0%	2.4%	0.0%	8.9%	11.5%	6.3%	6.7%
Open consultation	Number of reforms	6	3	11	3	8	8	3	42
	Percentage	37.5%	42.9%	26.8%	17.6%	17.8%	15.4%	18.8%	21.6%
Active involvement	Number of reforms	1	1	12	4	11	11	4	44
	Percentage	6.3%	14.3%	29.3%	23.5%	24.4%	21.2%	25.0%	22.7%
Total	Number of reforms	16	7	41	17	45	52	16	194
	Percentage	100.0%	100.0%	100.0%	100.0%	100.0%	100.0%	100.0%	100.0%
Consumers									
No involvement	Number of reforms	11	4	20	11	22	29	11	108
	Percentage	64.7%	57.1%	48.8%	73.3%	52.4%	58.0%	73.3%	57.8%
Passive involvement	Number of reforms	1	0	6	2	2	4	0	15
	Percentage	5.9%	0.0%	14.6%	13.3%	4.8%	8.0%	0.0%	8.0%
Open consultation	Number of reforms	4	3	13	2	9	10	2	43
	Percentage	23.5%	42.9%	31.7%	13.3%	21.4%	20.0%	13.3%	23.0%
Active involvement	Number of reforms	1	0	2	0	9	7	2	21
	Percentage	5.9%	0.0%	4.9%	0.0%	21.4%	14.0%	13.3%	11.2%
Total	Number of reforms	17	7	41	15	42	50	15	187
	Percentage	100.0%	100.0%	100.0%	100.0%	100.0%	100.0%	100.0%	100.0%

Some indication of the relevance of different stakeholders for the policy fields is provided in Table 5. It shows the differences in the involvement patterns for each specific stakeholder and policy field. Across all reform measures ‘Sectoral federations’ show the highest level of active involvement (45.9%), while for most measures ‘Trade unions’ and ‘Consumers’ were not involved (49.0% and 57.8% respectively).

In five policy fields (“Sector specific regulation”, “Start-up conditions”, “Improving the business environment”, “R&D and innovation”, and “Education”) the stakeholder ‘Sectoral federations’ was actively involved for most measures whereas for “Market integration” and “Competition policy” the same stakeholder was mainly consulted.

For ‘Trade unions’ and ‘Consumers’ no involvement is predominant across all policy fields. Furthermore, these two policy fields show a lower rate for specifications made (194 and 187) compared to ‘Sectoral federations’ (229), which suggests that for a substantial number of measures for which information on the involvement of ‘Sectoral federations’ was provided, no specifications were made for other stakeholders.

The involvement patterns of ‘other stakeholders’ are not described since the user guide does not clearly categorise those stakeholders and allows for the involvement of more

than one ‘other stakeholder’.¹³ For those reasons, the involvement of ‘other stakeholders’ is ignored in the indicator.

As the analysis above is based on a rather low number of specifications, we have assumed that the stakeholders ‘Sectoral federations’, ‘Trade unions’ and ‘Consumers’ are equally important.

A further assumption concerns the cases where at least one stakeholder was specified, but no data were provided on the other predefined stakeholders. Following the guidelines introduced earlier we assume that for the unspecified stakeholders the type of involvement is not observable. Therefore, we assume that the allocated value for its involvement must lie in the interval 0 to 1 (between “no involvement” and “active involvement”) which gives us a minimum and a maximum indicator value. The measures for which not a single stakeholder was specified are disregarded. Hence, the computation of the indicator is:

$$InvolvementIndicator_i = \frac{\sum_1^3 inv_i}{3} .$$

If data for one or even two of the possible three stakeholders are missing its (their) involvement is (are) assumed to lie in the interval 0 to 1 reflecting “no involvement” in the minimum scenario and “active involvement” in the maximum scenario.

The results obtained on the level of Member States and policy fields are presented in Table 6.

¹³ Among the specification made for the ‘other stakeholder’ mostly they were concentrated in the policy fields “R&D and innovation” and “improving the business environment”. For most measures more than one other stakeholder was provided. Stakeholders that were listed several times were research community, universities, governmental institutions, public administration, civil society/ general public, and NGOs.

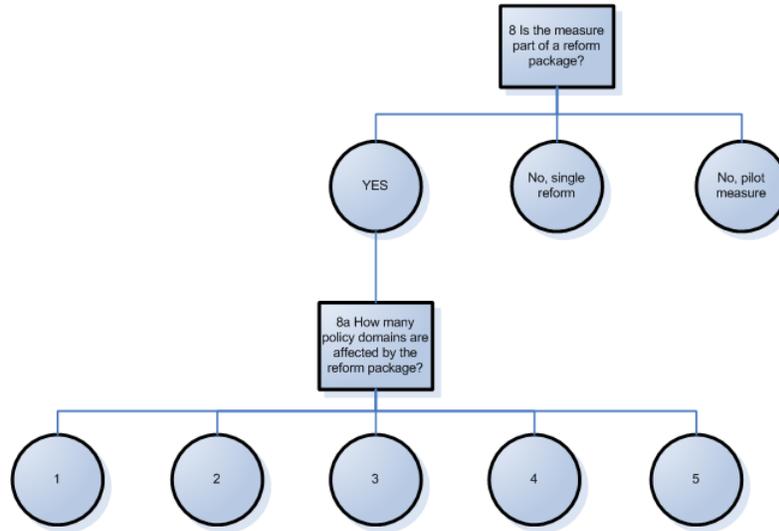
Table 6 Indicator of involvement by Member States and policy field

	Market integration		Competition Policy		Sector specific regulation		Start-up conditions		Improving the (small) business environment		R&D and Innovation		Education		Total		
	Min	Max	Min	Max	Min	Max	Min	Max	Min	Max	Min	Max	Min	Max	Min	Max	
AT									0.33	1.00					0.33	1.00	
	Indicator value																
	Number of reforms								2						2		
BE					0.04	0.04									0.04	0.04	
	Indicator value																
	Number of reforms				3										3		
BG									0.33	1.00	0.28	0.94			0.30	0.96	
	Indicator value																
	Number of reforms							1		2					3		
CY		0.55	0.55	0.00	0.22	0.00	0.00	0.33	0.33	0.34	0.42	0.13	0.20	0.00	0.00	0.21	0.27
	Indicator value																
	Number of reforms	2		3		1		4	3	9	10	4			33		
CZ		0.33	0.67					0.22	0.22	0.42	0.81	0.37	0.59		0.38	0.68	
	Indicator value																
	Number of reforms	2						1		6	3				12		
DE					0.67	0.67	0.67	1.00							0.67	0.75	
	Indicator value																
	Number of reforms				3			1							4		
DK					0.33	1.00				0.33	1.00	0.42	1.00		0.39	1.00	
	Indicator value																
	Number of reforms				1				1		4				6		
EE							0.44	0.44	0.22	0.39	0.33	0.33	0.28	0.28	0.29	0.35	
	Indicator value																
	Number of reforms						1	1	2	2	1	2	2	2	6		
EL					0.44	0.77	0.67	1.00	0.67	1.00	0.50	0.92			0.53	0.90	
	Indicator value																
	Number of reforms				2			1		1	4				8		
ES					0.66	0.89					0.33	0.78	0.44	0.77	0.49	0.82	
	Indicator value																
	Number of reforms				3						3	1			7		
FI									1.00	1.00					1.00	1.00	
	Indicator value																
	Number of reforms								2						2		
FR												1.00	1.00	1.00	1.00		
	Indicator value																
	Number of reforms											1			1		
HU																	
	Indicator value																
	Number of reforms																
IE		0.17	0.17	0.44	0.44	0.43	0.47	0.37	0.37	0.38	0.38	0.33	0.59	0.18	0.18	0.34	0.39
	Indicator value																
	Number of reforms	4		3		8		3		7	6	3	3	3	34		
IT		0.00	0.00			0.18	0.24	0.22	0.22	0.07	0.07	0.24	0.24	0.17	0.17	0.17	0.18
	Indicator value																
	Number of reforms	1				6		1		5		8		2		23	
LT																	
	Indicator value																
	Number of reforms																
LU				0.33	1.00										0.33	1.00	
	Indicator value																
	Number of reforms			2											2		
LV		0.36	0.36	0.22	0.89	0.55	0.67	0.44	0.78	0.44	0.44	0.58	0.76	0.48	0.92	0.49	0.66
	Indicator value																
	Number of reforms	4		1		6		1		4	9	3	3	3	28		
MT		0.33	0.33			0.39	0.39	0.11	0.11	0.47	0.47	0.52	0.57	0.83	1.00	0.47	0.51
	Indicator value																
	Number of reforms	1				2		2		4	6	2	2	2	17		
NL																	
	Indicator value																
	Number of reforms																
PL		0.17	0.50	0.44	0.44	0.52	0.63	0.22	0.22	0.49	0.62	0.40	0.40		0.43	0.54	
	Indicator value																
	Number of reforms	2		1		6		1		5		3			18		
PT					0.22	0.89					0.33	0.83			0.29	0.85	
	Indicator value																
	Number of reforms				1						2				3		
RO																	
	Indicator value																
	Number of reforms																
SE					0.66	0.66				0.00	0.00	0.33	1.00		0.41	0.58	
	Indicator value																
	Number of reforms				2				1		1				4		
SI											0.69	0.82	0.55	0.89	0.66	0.83	
	Indicator value																
	Number of reforms										5		1		6		
SK		0.61	0.77	0.89	0.89	0.63	0.63	0.77	0.77	0.55	0.89	0.59	0.59		0.62	0.74	
	Indicator value																
	Number of reforms	2		1		3		1		4	3				14		
UK										0.77	0.77	0.22	0.89		0.40	0.85	
	Indicator value																
	Number of reforms									1		2			3		
Total	Indicator value	0.32	0.41	0.32	0.56	0.44	0.53	0.37	0.43	0.40	0.55	0.39	0.60	0.34	0.47	0.39	0.54
	Number of reforms	18		11		47		17		55		72		19		239	

4.2.3 Indicator on the comprehensiveness of reform packages

The descriptive feature number 8 relates to the general context of a reform package. It is made up by the questions “8 Is the measure part of a reform package?”, “8a How many policy domains are covered by the reform package?”, and “8b Which policy domains are affected by the reform package?”. The information exploitable for a potential indicator is shown in **Error! Reference source not found.** The question 8b cannot be considered in an indicator as no ranking can be made among the policy domains to be specified.

Figure 2 The structure of the descriptive feature related to reform packages



As currently designed the questionnaire provides for the options “Yes”; “No, pilot measure”, and “No, single reforms” on the question whether the measure is part of a reform package. Consequently, the MICREF database does not allow for the full specification of a pilot measure which is at the same time part of a reform package.

Comprehensiveness can be related to the number of policy domains covered by the reform package. The indicator is a transformation based on the number of policy domains affected (x) and measures the comprehensiveness of the reform package to which the particular measure belongs. Reform measures for which the attributes “No, pilot measure” and “No, single reforms” were specified are not considered in the indicator since those measures are not part of a reform package. For the calculation of the indicator decreasing marginal returns with the number of policy domains are assumed. Functions that show this characteristic would be the square root function or a logarithmic function. We have chosen a function which provides an indicator value of 0 ($x=1$) if the reform package affects only one policy domain, whereas the reform package covering all five predefined policy domains would receive the highest score 1 ($x=5$). Taking the options above the transformation would be calculated as:

$$ComprehensivenessIndicator_i = \frac{\ln(x)}{\ln(5)},$$

where x refers to the number of policy domains affected. Once again, if it is known that the reform is part of a reform package but the number of policy domains is not specified, interval imputation is applied. Thus, the set of indicator value is:

$$\text{Combinations} = \begin{cases} 1.0 & \text{if (YES, } x=5) \\ \ln(4)/\ln(5) (\approx 0.86) & \text{if (YES, } x=4) \\ \ln(3)/\ln(5) (\approx 0.68) & \text{if (YES, } x=3) \\ \ln(2)/\ln(5) (\approx 0.43) & \text{if (YES, } x=2) \\ 0.0 & \text{if (YES, } x=1) \\ 0.0 \text{ and } 1.0 & \text{if (YES, no information)} \end{cases}$$

Using the interval imputation introduced earlier we can calculate 255 of 1289 reform measures in the current dataset. This corresponds to a rate of 19.8%.

When applying to the data we obtain the following results on Member State and policy field level.

Table 7 Indicator on comprehensiveness by Member States and policy field

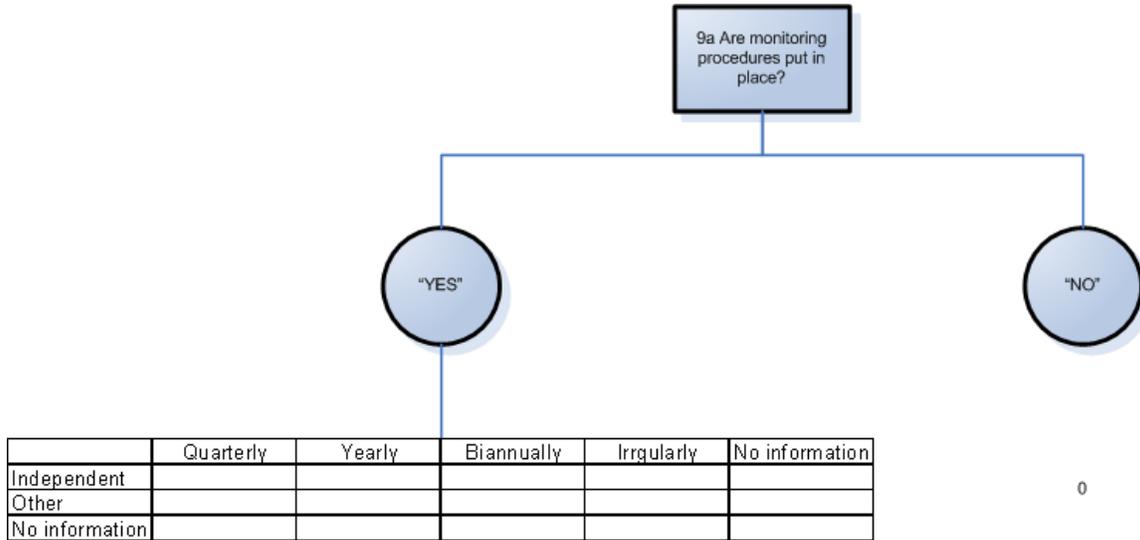
	Market integration		Competition Policy		Sector specific regulation		Start-up conditions		Improving the (small) business environment		R&D and Innovation		Education		Total		
	Min	Max	Min	Max	Min	Max	Min	Max	Min	Max	Min	Max	Min	Max	Min	Max	
AT	Indicator value	0.00	1.00			0.00	1.00			0.00	0.67	0.45	0.79			0.15	0.82
	Number of reforms	1				2				3	3					9	
BE	Indicator value					0.00	1.00					0.77	0.77			0.39	0.89
	Number of reforms					2					2					4	
BG	Indicator value					0.00	0.67			0.00	0.50	0.00	0.75	0.00	0.00	0.00	0.45
	Number of reforms					3				8	4			5		20	
CY	Indicator value			0.00	1.00			0.11	0.61	0.16	0.87	0.06	0.63	0.00	0.00	0.09	0.64
	Number of reforms			1				4	4	7	7			3		22	
CZ	Indicator value	0.00	1.00					0.00	0.50	0.00	1.00	0.00	1.00			0.00	0.80
	Number of reforms	1						2		1		1				5	
DE	Indicator value			0.43	0.43	0.00	1.00	0.36	0.61	0.26	0.76	0.00	1.00			0.23	0.76
	Number of reforms			1		3		4		6		1				15	
DK	Indicator value	1.00	1.00	0.00	0.00	0.00	0.00			0.84	0.84	0.76	0.76			0.66	0.66
	Number of reforms	1		1		1				2		6				11	
EE	Indicator value											0.00	1.00	0.00	0.00	0.00	0.50
	Number of reforms										1			1		2	
EL	Indicator value					0.00	1.00	0.22	0.72	0.11	0.86	0.29	0.62	0.43	0.43	0.11	0.86
	Number of reforms					10		2		4		3		1		20	
ES	Indicator value					0.00	1.00	0.86	0.86	0.74	0.88	0.57	0.72	0.00	1.00	0.59	0.85
	Number of reforms					3		5		7		7		1		23	
FI	Indicator value									0.00	0.00					0.00	0.00
	Number of reforms									1						1	
FR	Indicator value									0.00	0.00	0.00	0.00	0.00	1.00	0.00	0.25
	Number of reforms									2		1		1		4	
HU	Indicator value									0.00	1.00	0.00	1.00			0.00	1.00
	Number of reforms									1		1				2	
IE	Indicator value	0.00	1.00			0.32	0.57			0.00	0.75	0.00	1.00	0.00	1.00	0.11	0.77
	Number of reforms	1				4				4		2		1		12	
IT	Indicator value	0.43	0.43			0.11	0.11			0.00	0.00	0.17	0.28	0.22	0.22	0.13	0.18
	Number of reforms	1				6				5		9		2		23	
LT	Indicator value											0.00	1.00			0.00	1.00
	Number of reforms											1				1	
LU	Indicator value																
	Number of reforms																
LV	Indicator value			0.00	1.00	0.00	1.00	0.11	0.61	0.00	1.00	0.00	1.00	0.00	1.00	0.02	0.93
	Number of reforms			1		6		4		4		6		3		24	
MT	Indicator value	0.00	1.00					0.00	0.00	0.22	0.22	0.00	0.00	0.00	1.00	0.04	0.31
	Number of reforms	1						2		2		4		2		11	
NL	Indicator value											0.00	1.00			0.00	1.00
	Number of reforms											1				1	
PL	Indicator value					0.43	0.43			0.67	0.67	0.86	0.86			0.66	0.66
	Number of reforms					1				3		1				5	
PT	Indicator value					0.00	1.00	0.00	1.00			0.00	0.40	0.00	1.00	0.00	0.77
	Number of reforms					5		2				5		1		13	
RO	Indicator value											0.00	0.00	0.00	1.00	0.00	0.67
	Number of reforms											1		2		3	
SE	Indicator value																
	Number of reforms																
SI	Indicator value					0.00	1.00			0.00	0.00	0.83	0.83	0.00	0.00	0.49	0.57
	Number of reforms					1				3		7		1		12	
SK	Indicator value					0.00	1.00	0.00	1.00	0.00	1.00	0.00	0.00			0.00	0.80
	Number of reforms					4		1		3		2				10	
UK	Indicator value									0.00	1.00	0.00	0.00			0.00	0.50
	Number of reforms									1		1				2	
Total	Indicator value	0.24	0.91	0.11	0.61	0.05	0.81	0.27	0.65	0.18	0.65	0.27	0.62	0.04	0.49	0.18	0.66
	Number of reforms	6		4		51		26		67		77		24		255	

4.2.4 Indicator on monitoring

Effective monitoring ensures the successful implementation of a reform measure, signalling potential problems in time and urging for intervention.

The descriptive feature 9 relates to the monitoring procedures in the context of each reform measure. In a first step the existence of the monitoring procedures must be specified. If monitoring procedures are put in place by the Member State the attributes “monitoring body” and “monitoring frequency” should be filled in. This composition of the descriptive feature is shown in Figure 3.

Figure 3 Combinations of the descriptive feature “Monitoring”



An indicator on monitoring can only be calculated for those measures where an answer (“yes” or “no”) was given to the question on whether there is a monitoring procedure in place. If no information is available for a specific measure then this measure is excluded from the calculation of the indicator.

If the answer “no” was given, then the specific measure receives an indicator value of zero.

If the answer is “yes”, then there are two subsequent questions for the detailed specification of the monitoring process: “Is the monitoring body “independent” or “other”?” (independent / other) and “How often is the monitoring process executed?” (quarterly, yearly, biannually or irregularly).

Independence of the monitoring body:

According to the user guide the monitoring body can be independent or dependent (“other”).¹⁴ Once the existence of monitoring procedures is confirmed, the monitoring

¹⁴ According to the user guide an “independent body” is an institution whose members are not involved in any decision-making process as regards the measure. Moreover, they may not be exposed to implicit or

body is to be specified, the data show the following distribution for the attribute monitoring body with respect to the policy fields:

Table 8 The “monitoring body” across policy fields

		"Other"	"Independent"	
Market integration	Number of reforms	10	6	16
	Percentage	62.5%	37.5%	100.0%
Competition policy	Number of reforms	7	5	12
	Percentage	58.3%	41.7%	100.0%
Sector specific regulation	Number of reforms	22	20	42
	Percentage	52.4%	47.6%	100.0%
Start-up conditions	Number of reforms	18	6	24
	Percentage	75.0%	25.0%	100.0%
Improving the (small) business environment	Number of reforms	45	4	49
	Percentage	91.8%	8.2%	100.0%
R&D and Innovation	Number of reforms	55	12	67
	Percentage	82.1%	17.9%	100.0%
Education	Number of reforms	15	2	17
	Percentage	88.2%	11.8%	100.0%
over all policy fields	Number of reforms	172	55	227
	Percentage	75.8%	24.2%	100.0%

The empirical results suggest that in each policy field a higher share of reforms is monitored by the “other” monitoring body which is by definition the one that is involved in the design and / or decision-making process related to the reform measure (see Table 8).

As the indicator should produce numerical values between zero and one this qualitative characteristic has to be transformed into numerical values between 0 and 1, with 1 being “better” than 0. In our concrete example of the monitoring indicator we followed the expert’s assessment by assigned the following attribute values for the attribute independence of the monitoring body:

$$indep_i = \begin{cases} 1.0 & \text{if the monitoring body of measure } i \text{ is independent} \\ 0.5 & \text{if the monitoring body of measure } i \text{ is dependent} \\ 0.5 \text{ or } 1.0 & \text{if no information was provided.} \end{cases}$$

Following this conceptual approach the choice of 1.0 for an independent monitoring body seems to be quite obvious. In contrast to that the choice of the attribute value for a **dependent** monitoring body is somehow subjective. We can only say that the value for a

explicit pressures aimed at influencing the assessment in some way (This would not be fulfilled e.g. for ministerial or governmental working groups).

dependent monitoring body should not be zero (which is the score associated to no procedure in place) and lower than one.

Frequency of the monitoring process:

For 169 measures we obtain also a specification of the monitoring frequency. The results are shown below.

Table 9 The “monitoring frequency” across policy fields

		"Irregularly"	"Biannually"	"Quarterly"	"Yearly"	
Market integration	Number of reforms	7	0	5	1	13
	Percentage	53.8%	0.0%	38.5%	7.7%	100.0%
Competition policy	Number of reforms	2	0	1	6	9
	Percentage	22.2%	0.0%	11.1%	66.7%	100.0%
Sector specific regulation	Number of reforms	9	3	1	15	28
	Percentage	32.1%	10.7%	3.6%	53.6%	100.0%
Start-up conditions	Number of reforms	7	2	3	6	18
	Percentage	38.9%	11.1%	16.7%	33.3%	100.0%
Improving the (small) business environment	Number of reforms	13	3	5	14	35
	Percentage	37.1%	8.6%	14.3%	40.0%	100.0%
R&D and Innovation	Number of reforms	9	7	7	31	54
	Percentage	16.7%	13.0%	13.0%	57.4%	100.0%
Education	Number of reforms	1	1	1	9	12
	Percentage	8.3%	8.3%	8.3%	75.0%	100.0%
over all policy fields	Number of reforms	48	16	23	82	169
	Percentage	28.4%	9.5%	13.6%	48.5%	100.0%

The analysis of the current data shows that a yearly monitoring (i.e. from every six months to every one and a half year) is the adequate option for most measures (for all policy fields but “Market integration”). A quarterly monitoring (i.e. from daily to every six months) was regarded as being better than a biannual monitoring (i.e. regularly, but less frequent than every one and a half year). Finally, an irregular monitoring was considered as the worst solution, leading to the following order of options: Yearly > Quarterly > Biannually > Irregularly. The attribute values related to the monitoring frequency have been chosen in the following way:

$freq_i = \begin{cases} 1.0 & \text{if the monitoring frequency of measure } i \text{ is regular,} \\ & \text{from every six months to every one and a half year.} \\ 0.7 & \text{if the monitoring frequency of measure } i \text{ is regular} \\ & \text{from daily to every six months.} \\ 0.5 & \text{if the monitoring frequency of measure } i \text{ is regular, but} \\ & \text{less frequent than every one and a half year.} \\ 0.2 & \text{if the monitoring frequency of measure } i \text{ is irregular} \\ 0.2 \text{ or } 1.0 & \text{if no information was provided.} \end{cases}$

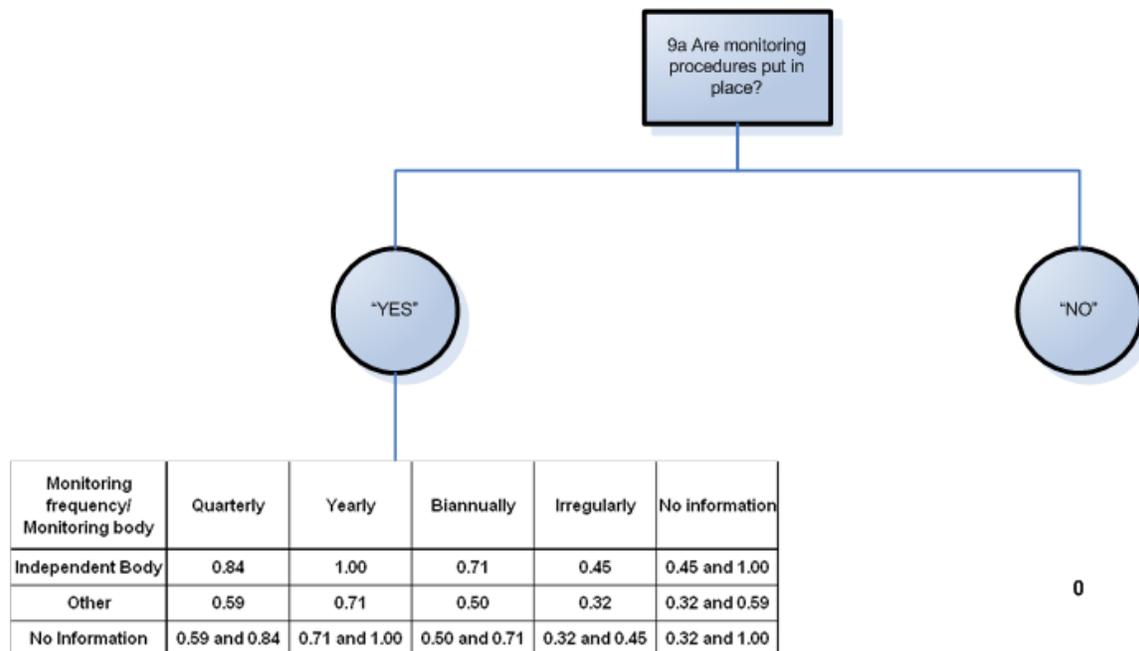
Combination of the two monitoring attributes:

The two attributes independence and frequency of the monitoring process are then combined for each measure i by calculating a geometric average of the two attribute values:

$$MonitoringIndicator_i = \sqrt{indep_i * freq_i} .$$

The geometric average was chosen so as to penalise “dependent” and “irregular monitoring” processes which are regarded as the worst scenario. A reform measure with a dependent monitoring body can always improve less its indicator score by improving the monitoring frequency than a reform with an independent monitoring body. Furthermore, the more the monitoring frequency of a reform measure deviates from the yearly monitoring the less the indicator value of a reform measure can be improved by changing from a dependent to an independent monitoring body. The assumptions in our example lead us to the following matrix of possible indicator values:

Figure 4 Matrix of indicator values for the monitoring indicators



In order to receive an average value for a specific policy field (or country), the arithmetic average over all measure in a specific field (or in a country) is calculated which may lead to two indicator values per measure if information on one or even both of the attributes was missing. This translates into the following results on the level of Member States and by broad policy fields:

Table 10 Indicator on monitoring by Member States and policy fields

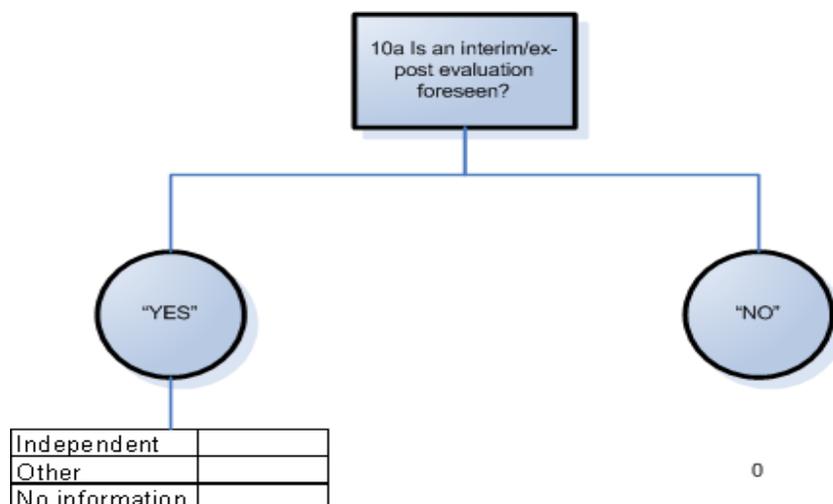
		Market integration		Competition Policy		Sector specific regulation		Start-up conditions		Improving the (small) business environment		R&D and Innovation		Education		Total		
		Min	Max	Min	Max	Min	Max	Min	Max	Min	Max	Min	Max	Min	Max	Min	Max	
AT	Indicator value																	
	Number of reforms																	
BE	Indicator value					0.00	0.00										0.00	0.00
	Number of reforms						3										3	
BG	Indicator value					0.71	0.71			0.59	0.59	0.60	0.60				0.63	0.63
	Number of reforms						1				1		2				4	
CY	Indicator value	0.45	0.45	0.58	0.85			0.53	0.53	0.46	0.46	0.63	0.63				0.53	0.56
	Number of reforms		2		2			4			7		6				21	
CZ	Indicator value	0.38	0.58	0.45	0.45	0.45	0.45	0.32	0.32	0.21	0.34	0.58	0.80				0.39	0.53
	Number of reforms		2		1		1		1		3		3				11	
DE	Indicator value					0.78	0.78					0.45	1.00				0.73	0.82
	Number of reforms						5						1				6	
DK	Indicator value			1.00	1.00	1.00	1.00					0.32	1.00				0.66	1.00
	Number of reforms				1		1						2				4	
EE	Indicator value							0.45	1.00	0.35	0.35	0.71	0.71	0.35	0.35		0.43	0.52
	Number of reforms								1		2		1		2		6	
EL	Indicator value			0.00	0.00	0.32	0.71	0.71	0.71	0.43	0.53	0.71	0.71	0.32	1.00		0.47	0.61
	Number of reforms				1		1		1		4		3		1		11	
ES	Indicator value	0.32	0.71	0.51	0.71	0.25	0.56	0.36	0.69	0.35	0.71	0.32	0.67	0.32	0.71		0.32	0.65
	Number of reforms		2		2		14		6		11		10		5		50	
FI	Indicator value									0.32	1.00	0.71	1.00				0.51	1.00
	Number of reforms										1		1				2	
FR	Indicator value									0.71	0.71	0.32	0.71				0.51	0.71
	Number of reforms										2		2				4	
HU	Indicator value																	
	Number of reforms																	
IE	Indicator value	0.53	0.53	0.67	0.67	0.49	0.56	0.72	0.72	0.29	0.29	0.27	0.27	0.44	0.44		0.45	0.46
	Number of reforms		4		3		8		3		7		6		3		34	
IT	Indicator value	0.32	0.32	0.00	0.00	0.16	0.16			0.25	0.25	0.29	0.29	0.85	0.85		0.28	0.28
	Number of reforms		1		1		6				5		8		2		23	
LT	Indicator value											0.32	1.00				0.32	1.00
	Number of reforms												1				1	
LU	Indicator value																	
	Number of reforms																	
LV	Indicator value	0.53	0.53	0.71	0.71	0.93	0.93	0.67	0.67	0.48	0.48	0.76	0.76	0.71	0.71		0.69	0.69
	Number of reforms		4		1		4		3		4		9		2		27	
MT	Indicator value	0.45	0.45			0.66	0.85	0.45	0.45	0.54	0.54	0.42	0.42	0.53	0.80		0.50	0.59
	Number of reforms		1				2		2		3		6		5		19	
NL	Indicator value																	
	Number of reforms																	
PL	Indicator value	0.16	0.16	0.59	0.59	0.62	0.62	0.71	0.71	0.40	0.40	0.69	0.69				0.55	0.55
	Number of reforms		2		1		6		1			6					21	
PT	Indicator value											0.38	0.85				0.38	0.85
	Number of reforms												2				2	
RO	Indicator value			0.32	0.71					0.32	1.00			0.50	0.50		0.38	0.74
	Number of reforms				1						1				1		3	
SE	Indicator value									0.00	0.00	0.51	0.93	0.71	0.71		0.46	0.74
	Number of reforms										1		4		1		6	
SI	Indicator value									0.51	0.71	0.58	0.58				0.56	0.61
	Number of reforms										2		5				7	
SK	Indicator value	0.16	0.16	0.32	0.32	0.40	0.40	0.32	0.38	0.33	0.33	0.57	0.57				0.37	0.38
	Number of reforms		2		1		3		2		4		3				15	
UK	Indicator value					0.32	1.00	0.32	0.71			0.58	0.71				0.47	0.77
	Number of reforms						1		1				3				5	
Total	Indicator value	0.40	0.46	0.50	0.59	0.45	0.56	0.50	0.62	0.38	0.48	0.50	0.63	0.49	0.68		0.46	0.57
	Number of reforms		20		15		56		25		63		84		22		285	

4.2.5 Indicator on evaluation

Interim / or ex-post evaluation is important for fine-tune or, depending on their observed efficiency, even abandon unsuccessful measures in the future. It can assess whether certain undesirable or disappointing outcomes reflect policy design mistakes, implementation lags or implementation failures.

The indicator on evaluation summarises the information of the descriptive feature number 10 on evaluation. According to the set-up of the questionnaire, the existence of an interim / ex-post evaluation procedure first needs to be specified (descriptive feature 10a). The second question refers to the independence of the evaluating body (10b). The completion of the second question depends therefore on the answer provided to the first. This structure is shown in Figure 5.

Figure 5 Structure of descriptive features regarding “Evaluation”



For the interim/ex-post evaluation procedures put in place we can observe the following distribution of the body’s characteristic across the policy fields.

Table 11 The interim/ex-post evaluating body across policy fields

		"Other"	"Independent"	
Market integration	Number of reforms	7	0	7
	Percentage	100.0%	0.0%	100.0%
Competition policy	Number of reforms	5	0	5
	Percentage	100.0%	0.0%	100.0%
Sector specific regulation	Number of reforms	5	8	13
	Percentage	38.5%	61.5%	100.0%
Start-up conditions	Number of reforms	4	5	9
	Percentage	44.4%	55.6%	100.0%
Improving the (small) business environment	Number of reforms	19	4	23
	Percentage	82.6%	17.4%	100.0%
R&D and Innovation	Number of reforms	18	13	31
	Percentage	58.1%	41.9%	100.0%
Education	Number of reforms	6	1	7
	Percentage	85.7%	14.3%	100.0%
over all policy fields	Number of reforms	64	31	95
	Percentage	67.4%	32.6%	100.0%

The policy fields “Sector specific regulation” and “Start-up conditions” are the only policy fields where we find a higher share of measures that are evaluated by an “independent” body. However, we assume analogously to the proposed indicator on monitoring the independence of the evaluating body is considered in the following order:

Independent body \succ other body.

The values of 1.0 and 0.5 are allocated to the options independent and dependent respectively. In cases in which the existence of evaluation procedures is confirmed but no information has been provided on the evaluating body, we assume again a minimum and a maximum scenario for the indicator value.

$$\text{EvaluationIndicator}_i = \begin{cases} 1.0 & \text{if (YES, Independent)} \\ 1.0 & \text{if (YES, No information) Max.} \\ 0.5 & \text{if (YES, No information) Min.} \\ 0.5 & \text{if (YES, Other);} \\ 0.0 & \text{if (NO, (answer not relevant))} \end{cases}$$

For further aggregation, e.g across policy fields, the mean is calculated. For countries that did not specify the evaluating body two indicator values are provided, reflecting the assumption made above, results are shown in Table 12.

Table 12 Indicator on evaluation by Member States and policy fields

	Market integration		Competition Policy		Sector specific regulation		Start-up conditions		Improving the (small) business environment		R&D and Innovation		Education		Total		
	Min	Max	Min	Max	Min	Max	Min	Max	Min	Max	Min	Max	Min	Max	Min	Max	
AT											1.00	1.00			1.00	1.00	
	Indicator value																
	Number of reforms										1				1		
BE					0.00	0.00	0.50	1.00			0.50	1.00			0.20	0.40	
	Indicator value																
	Number of reforms				3		1				1				5		
BG																	
	Indicator value																
	Number of reforms						1										
CY	0.50	0.50	0.50	0.50			0.25	0.25	0.25	0.25	0.75	0.75			0.44	0.44	
	Indicator value																
	Number of reforms	1		2			2		2	2	2				9		
CZ	0.50	0.50					0.50	0.50	0.00	0.00	0.50	0.50	0.50	0.50	0.42	0.42	
	Indicator value																
	Number of reforms	2					1		1		1		1		6		
DE					1.00	1.00									1.00	1.00	
	Indicator value																
	Number of reforms				1										1		
DK			0.50	0.50							0.50	1.00			0.50	0.83	
	Indicator value																
	Number of reforms		1								2				3		
EE							1.00	1.00	0.00	0.00	0.50	0.50	0.50	0.50	0.50	0.50	
	Indicator value																
	Number of reforms						1		1		1		1		4		
EL							1.00	1.00	1.00	1.00	1.00	1.00			1.00	1.00	
	Indicator value																
	Number of reforms						1		2		2				5		
ES			0.50	0.50	0.00	0.00	0.50	0.50			0.50	0.75			0.33	0.42	
	Indicator value																
	Number of reforms		1		2		1				2				6		
FI									0.50	1.00	1.00	1.00			0.75	1.00	
	Indicator value																
	Number of reforms								1		1				2		
FR																	
	Indicator value																
	Number of reforms																
HU																	
	Indicator value	0.00	0.00	0.00	0.00	0.13	0.13	0.33	0.33	0.21	0.21	0.20	0.20	0.33	0.33	0.17	0.17
	Number of reforms	4		3		8		3		7		5		3		33	
IE	0.50	0.50			0.25	0.25			0.40	0.40	0.25	0.25	0.50	0.50	0.32	0.32	
	Indicator value																
	Number of reforms	1				6			5		4		1		17		
IT											0.50	1.00			0.50	1.00	
	Indicator value																
	Number of reforms										1				1		
LU																	
	Indicator value																
	Number of reforms																
LV	0.00	0.00			0.75	0.75			0.50	0.50	0.50	0.50			0.54	0.54	
	Indicator value																
	Number of reforms	1				4			3		4				12		
MT	0.50	0.50			0.75	0.75	1.00	1.00	0.33	0.33	0.42	0.42	0.33	0.50	0.50	0.53	
	Indicator value																
	Number of reforms	1				2		2	3		6		3		17		
NL											0.50	1.00			0.50	1.00	
	Indicator value																
	Number of reforms										2				2		
PL	0.25	0.25	0.50	0.50	0.17	0.17	0.00	0.00	0.30	0.30	0.25	0.25			0.24	0.24	
	Indicator value																
	Number of reforms	2		1		6		1	5		4				19		
PT																	
	Indicator value																
	Number of reforms																
RO																	
	Indicator value																
	Number of reforms																
SE	0.50	1.00									0.75	0.75	0.50	0.50	0.63	0.75	
	Indicator value																
	Number of reforms	1									2		1		4		
SI									0.50	0.50	0.70	0.70	0.50	0.50	0.64	0.64	
	Indicator value																
	Number of reforms								1		5		1		7		
SK	0.25	0.25			0.50	0.75	0.25	0.25	0.38	0.38	0.50	0.50			0.38	0.42	
	Indicator value																
	Number of reforms	2			2		2		4		2				12		
UK					0.50	1.00			1.00	1.00	0.50	0.50			0.67	0.83	
	Indicator value																
	Number of reforms					1			1		1				3		
Total	Indicator value	0.27	0.30	0.31	0.31	0.30	0.33	0.50	0.53	0.38	0.39	0.50	0.57	0.41	0.45	0.40	0.43
	Number of reforms	15		8		35		15		36		49		11		169	

4.2.6 Indicator on the revealed preferences (based on the microeconomic channel) - MC

Microeconomic reforms can have an impact through different so called microeconomic channels on the economy. The descriptive feature number 12 predefines six channels. (“Entry / Exit”, “Direct costs of doing business”, “Increase of public/private R&D”, “Innovation performance”, “Mark-ups”, and “Productivity”).

The indicator on the revealed preferences based on the microeconomic channel uses the shares of the microeconomic channels ‘k’ within a Member State ‘j’ in a specific area of reform ‘i’ and compares it with the shares of a reference group (EU-27, Euro area, etc.). For the calculation of the indicator we relied on a dataset covering the period 2004-2006 for the EU-25. The share of the microeconomic channels can be obtained by dividing the

number of reforms for which a particular channel has been ticked (Entry/Exit) for a specific Member States and a specific area of reform by the number of all reforms in the same area of reform for this Member State (or of a group of countries if a group is under study).

As regards the analysis of the microeconomic channel we are not restricted by the low rate of data completion since the specification of this descriptive feature is made by the compiler if the general description of a reform measure gives sufficiently detailed information to determine one or more than one channels.¹⁵ The completion rate of this feature is therefore relatively high with 65% of all reforms showing at least one microeconomic channel (multiple answer are permitted).

A possible approach to assess the profile of microeconomic channels of a Member States is the computation of the square root of the sum of the (equally weighted) squared differences of a particular Member State ‘j’ in the area of reform ‘i’ versus the EU-25 shares. The indicator on microeconomic channels (MC) for Member State ‘j’ in area of reform ‘i’ can be computed as

$$MC_{j,k} = \sqrt{\sum_i \frac{(x_{i,j,k} - x_{i,EU,k})^2}{K}};$$

with $x_{i,j,k}$ as the share of reform measures acting through the microeconomic channel ‘k’ in Member State ‘j’ in area of reform ‘i’ and $x_{i,EU,k}$ as the share of measures acting through the microeconomic channel ‘k’ for the entire EU-25 in area of reform ‘i’. ‘K’ is the number microeconomic channels (=6). Applying this approach to the data we obtain the following results.

¹⁵ For instance a reform measure addressing the access to finance of SMEs may affect the economy through the “Entry/Exit” channel.

Table 13 Indicator on the revealed preferences based on the microeconomic channel

Member State	Policy field k							Deviation from the reference profile (EU-25)
	Market integration	Competition policy	Sector-specific regulation	Start-up conditions	Improving the (small) business environment	R&D and Innovation	Education	
IT	12.5%	59.5%	18.4%	25.8%	23.4%	15.5%	31.2%	42.0%
MT	21.4%	16.5%	27.9%	53.8%	35.0%	10.1%	25.8%	38.1%
CY	26.4%	14.0%	48.0%	31.9%	21.3%	7.8%	35.2%	36.2%
LV	26.4%	27.8%	18.0%	29.4%	29.3%	8.4%	28.6%	34.8%
DK	25.8%	50.4%	15.5%	19.4%	15.2%	11.6%	15.2%	33.7%
EL	21.4%	16.5%	10.7%	23.4%	23.9%	19.5%	24.3%	32.8%
LU	21.4%	17.6%	40.8%	28.3%	15.6%	13.9%	54.6%	31.3%
NL	21.4%	27.8%	21.8%	38.0%	18.5%	7.5%	19.1%	28.8%
IE	32.9%	24.2%	19.7%	22.2%	18.3%	11.5%	17.3%	26.4%
SE	22.9%	35.7%	9.4%	26.5%	12.2%	5.7%	43.7%	26.0%
CZ	25.1%	10.2%	17.8%	19.2%	21.2%	6.8%	9.0%	25.8%
ES	18.2%	34.5%	10.2%	23.2%	13.5%	20.2%	31.1%	23.2%
BE	21.4%	27.8%	17.4%	19.5%	12.7%	11.8%	39.6%	22.9%
EE	21.4%	24.6%	37.8%	11.9%	15.3%	9.2%	18.2%	22.3%
PT	30.2%	27.8%	12.8%	14.3%	22.5%	6.6%	17.2%	22.3%
PL	17.0%	27.8%	8.0%	26.2%	23.0%	5.0%	19.1%	21.1%
UK	21.4%	24.6%	28.2%	32.6%	8.5%	10.9%	11.9%	19.2%
FR	43.3%	35.7%	11.6%	27.3%	14.9%	9.3%	17.6%	18.5%
DE	21.4%	17.1%	14.3%	20.2%	6.0%	10.5%	19.1%	18.5%
SK	15.2%	49.4%	14.5%	15.1%	14.0%	12.2%	14.3%	18.2%
FI	16.6%	33.2%	21.8%	26.5%	11.7%	8.9%	19.1%	18.1%
SI	15.2%	27.8%	7.5%	29.9%	13.6%	16.0%	12.3%	18.0%
HU	21.4%	27.8%	10.9%	11.9%	16.3%	11.0%	13.9%	17.9%
LT	23.5%	33.2%	19.0%	26.5%	11.1%	30.0%	11.3%	14.3%
AT	21.4%	16.5%	33.1%	24.7%	14.4%	13.5%	19.1%	9.3%

So in Table 13 it can be observed that e.g. the reforms in “R&D and innovation” in Poland (PL) have microeconomic channels not so far from the EU-25 as a whole ($MC_{SE, R\&D\ and\ innovation}=5.0\%$ compared to $MC_{EU, R\&D\ and\ innovation}=0.0\%$) and that the reforms in the policy area “Competition policy” in Italy (IT) have microeconomic channels that are very different ($MC_{IT, Competition\ policy}=59.5\%$) from the EU reference.

If one does not consider the policy field and therefore takes the policy field ‘i’ out of the formula, as shown in the following

$$MC_j = \sqrt{\sum_i \frac{(x_{j,k} - x_{EU,k})^2}{K}};$$

then this shows whether Member State ‘j’ aims to act with (all) its reforms through the same microeconomic channels as the EU on average or not. In **Error! Reference source not found.** this can be seen in the far-right column. It can be observed that the profile of microeconomic channels of Austria (AT) is closer to the EU average than the profile of Italy (IT) or Malta (MT).

This ‘Deviation from the reference profile’ can also be used to compare this indicator MC on the revealed preference based on microeconomic channels with the indicator RP on the revealed preferences based on the reform profiles (see section 4.1.1). This comparison shows e.g. that Malta - which has a reform profile close to the EU reference ($RP_{MT}=5.25\%$ and 5.11% , $RP_{EU}=0\%$) – has microeconomic channels very divergent from the EU reference ($MC_{MT}=38.1\%$, $MC_{EU}=0\%$).

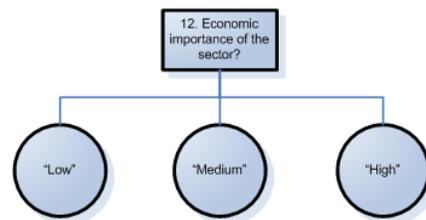
4.2.7 Discussion on the “economic importance of sector”

The descriptive feature number 12 is to specify the “economic importance of the sector”. In more detail the user guide defines

“This question is only relevant when analysing measures recorded under “sector-specific regulation”, as measures recorded under other policy fields (i.e. education, R&D) usually affect the whole economy. Electricity, Gas and Water are by default sectors of high economic importance whereas the economic importance of other sectors should be determined by indicators like the share of gross value added of the sector in the country (based on the NACE industry classification), share of exports, total turnover etc.”.

The compiler has the opportunity to specify the sector as of “low”, “medium” or “high” economic importance as shown in Figure 6.

Figure 6 Structure economic importance of the sector



Based on the structure of this descriptive feature and the instructions provided in the user guide we currently do not foresee the development of indicator for this descriptive feature. There are two main considerations:

1) Only three answers are allowed: “low”, “medium”, “high”. Indicator values would directly be derived from these answers. For this reason we would rather speak of a transformation of these answers into quantitative measures. The advantage would be that the information is condensed in a single figure facilitating comparisons across countries. While the absolute value for the options is to be discussed, the order would be $x_3 > x_2 > x_1$, reflecting the preference order “high” \succ “medium” \succ “low”.

Allocating values to the options from an interval between 0 and 1 to x_3, x_2, x_1 one could choose e.g. the values 1; 0.5; 0.0. As a consequence, the average taken for two measures – one of “high” economic importance another of “low” economic importance – would equal the value of a measure of “medium” importance. If this result is to be avoided one needs to assume alternative values for x_3, x_2 , and x_1 .

2) Doubts can arise concerning the concept of “economic importance” and its description in the user guide. According to the user guide only measures recorded under the policy field “sector specific regulation” are to be specified and moreover, some sectors (electricity, gas and water) are defined by default as ‘highly’ important sectors.

The other sectors under this policy field (“telecommunication”, “air transportation”, “public local transport”, “railways”, “professional services”, and “wholesale trade”) have to be determined in terms of the economic importance using a set of exogenous data (e.g. the gross value added of the sector). As a consequence, the enquiry about the economic

importance has no relation to the reform measure as such but is exogenous and can be obtained from statistics as referred to in the user guide.

The descriptive feature does not aim at a classification of a reform measure's significance or its potential economic impact. For this, it would be necessary to develop clear criteria to determine the reform measures' significance that would need to take into account the significance of individual reform measures for a particular Member State. The economic importance of a reform could be derived from information provided on other descriptive features or the general description of its main features.

As currently designed the descriptive feature "economic importance" is not considered for the development of an indicator, because the comparability of the data entries is low. The transformation of the three options "high", "medium" or "low" would not provide a value added.

5 Conclusion

The present reports shows how the information obtained from the MICREF database can be condensed in indicators on properties of microeconomic reforms. Depending on whether the indicators aim at the reform activity or the reform characteristics the current state of the database provides different challenges for the development of meaningful indicators.

While for the development of indicators based on the reform activity (i.e. the number or the share of reforms) one needs to take into account to what extent the provided data are comparable for instance across Member States and policy fields, the missing data among the non-mandatory descriptive features presents the main obstacle to gain further knowledge about the reform characteristics. Although this problem can be addressed through the application of interval imputation the rate of data completeness remains low and limits the representativeness of the results.

The design of the suggested indicators is driven by the assumptions taken in the development process. In fact, it seems difficult to justify the one or the other assumption made (for instance on how to combine different attributes of one descriptive feature) since so far no approaches to capture qualitative reform characteristics in indicators are known and the current state of the data set is not sufficient to empirically back up the decisions taken in the development of individual indicators. This problem applies as well to the allocation of scores to the attributes of a reform characteristic. For this reason the suggested concepts and the underlying assumptions should be further discussed by subject matter experts.

The objective of the indicator presented in this paper, however, is not to rank different features of the reform design, but to translate the combination of characteristics of the reform design into scales of scores that summarize a specific reform property in one figure. Without an in-depth analysis of the reform measures by e.g. benchmarking the measure to its initial objectives, it is not clear why a specific pattern in the reform properties should be preferable to an alternative one. Moreover, the indicators do not allow drawing conclusions about the appropriateness of the reforms carried out by the

governments of the EU Member States. The question of the appropriateness of the reforms can only be answered by a qualitative investigation of the implemented reforms. The presented indicators, however, can be considered as useful tool to summarize and identify some patterns in the reform characteristics. The higher the level of data completion along the descriptive features the higher will be the representativeness of indicator values on reform characteristics.

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Annex

Table 14 Indicator on speed of implementation (fully completed descriptive feature)

		Market integration	Competition Policy	Sector specific regulation	Start-up conditions	Improving the (small) business environment	R&D and Innovation	Education	Total
AT	Indicator value	0.03		7.58		10.37	4.07		6.80
	Number of reforms	1		3		2	1		7
BE	Indicator value			13.82			6.20		5.71
	Number of reforms			2			2		4
BG	Indicator value			2.72		8.70	4.00		6.32
	Number of reforms			2		4	1		7
CY	Indicator value	0.03	5.38		5.33	5.77	0.00		3.67
	Number of reforms	1	2		2	2	2		9
CZ	Indicator value	2.30	1.65	3.17	8.27	2.23	0.43	1.73	3.36
	Number of reforms	2	2	3	3	1	2	1	14
DE	Indicator value	0.20	1.77	0.13	0.33	3.38	2.96		3.23
	Number of reforms	1	3	7	2	8	3		24
DK	Indicator value	3.53	1.57	7.72					5.65
	Number of reforms	1	1	3					5
EE	Indicator value				1.22			0.00	0.81
	Number of reforms				2			1	3
EL	Indicator value			7.93			0.62		6.46
	Number of reforms			8			2		10
ES	Indicator value	0.12	0.05	4.93	4.89	3.33	0.60	0.38	3.31
	Number of reforms	2	2	11	4	4	2	2	27
FI	Indicator value	4.63				4.93			4.78
	Number of reforms	1				1			2
FR	Indicator value		4.70	2.83	5.30	13.50			6.58
	Number of reforms		1	1	1	1			4
HU	Indicator value							13.47	13.47
	Number of reforms							1	3
IE	Indicator value	0.00	0.21	24.33		1.30			9.26
	Number of reforms	1	3	4		3			11
IT	Indicator value		0.23	4.59	18.43	0.66	1.84	3.10	3.00
	Number of reforms		1	5	1	4	10	3	24
LT	Indicator value	1.33		0.30			0.53	11.20	2.73
	Number of reforms	1		2			1	1	5
LU	Indicator value								
	Number of reforms								
LV	Indicator value	0.94	0.00	3.81	0.37	0.53	6.79	3.16	3.23
	Number of reforms	4	1	4	1	3	6	3	22
MT	Indicator value	7.33		0.00		0.00	4.13		2.87
	Number of reforms	1		1		1	1		4
NL	Indicator value					7.40			7.40
	Number of reforms					1			1
PL	Indicator value	2.27	1.77	1.86	1.50	2.77	9.21		3.63
	Number of reforms	5	1	6	2	5	5		24
PT	Indicator value			24.93					24.93
	Number of reforms			1					1
RO	Indicator value						3.90		3.90
	Number of reforms						1		1
SE	Indicator value			0.23		0.53			0.38
	Number of reforms			1		1			2
SI	Indicator value	3.47		4.77		0.93	3.28	7.23	3.69
	Number of reforms	1		1		1	4	1	8
SK	Indicator value	1.38		3.57	9.81	4.11	2.76		4.43
	Number of reforms	2		4	3	5	3		17
UK	Indicator value		0.00		0.00	2.03			0.51
	Number of reforms		1		2	1			4
Total	Indicator value	1.80	1.58	5.82	4.99	3.78	3.65	4.09	4.11
	Number of reforms	24	18	69	23	48	46	13	241

Table 15 Indicator on involvement (fully completed descriptive features)

		Market integration	Competition Policy	Sector specific regulation	Start-up conditions	Improving the (small) business environment	R&D and Innovation	Education	Total
AT	Indicator value								
	Number of reforms								
BE	Indicator value			0.04					0.04
	Number of reforms			3					3
BG	Indicator value								
	Number of reforms								
CY	Indicator value	0.55	0.00	0.00	0.33	0.36	0.14	0.00	0.22
	Number of reforms	2	2	1	4	8	9	4	30
CZ	Indicator value	0.33			0.22	0.50	0.39		0.39
	Number of reforms	1			1	2	2		6
DE	Indicator value			0.67					0.67
	Number of reforms			3					3
DK	Indicator value								
	Number of reforms								
EE	Indicator value				0.44	0.22	0.33	0.28	0.31
	Number of reforms				1	1	1	2	5
EL	Indicator value			0.66					0.66
	Number of reforms			1					1
ES	Indicator value			0.83		0.33			0.66
	Number of reforms			2		1			3
FI	Indicator value					1.00			1.00
	Number of reforms					2			2
FR	Indicator value							1.00	1.00
	Number of reforms							1	1
HU	Indicator value								
	Number of reforms								
IE	Indicator value	0.17	0.44	0.43	0.37	0.38	0.33	0.18	0.34
	Number of reforms	4	3	7	3	7	4	3	31
IT	Indicator value	0.00		0.11	0.22	0.07	0.24	0.17	0.15
	Number of reforms	1		5	1	5	8	2	22
LT	Indicator value								
	Number of reforms								
LU	Indicator value								
	Number of reforms								
LV	Indicator value	0.36		0.60		0.44	0.72		0.55
	Number of reforms	4		5		4	6		19
MT	Indicator value	0.33		0.39	0.11	0.44	0.58	1.00	0.47
	Number of reforms	1		2	2	4	5	1	15
NL	Indicator value								
	Number of reforms								
PL	Indicator value	0.33	0.44	0.44	0.22	0.55	0.40		0.44
	Number of reforms	1	1	4	1	4	3		14
PT	Indicator value								
	Number of reforms								
RO	Indicator value								
	Number of reforms								
SE	Indicator value			0.66		0.00			0.44
	Number of reforms			2		1			3
SI	Indicator value						0.77		0.77
	Number of reforms						4		4
SK	Indicator value	0.66	0.89	0.63	0.77	0.77	0.59		0.68
	Number of reforms	1	1	3	1	2	3		11
UK	Indicator value					0.77			0.77
	Number of reforms					1			1
Total	Indicator value	0.32	0.38	0.44	0.32	0.42	0.42	0.26	0.39
	Number of reforms	15	7	38	14	41	46	13	174

Table 16 Indicator on monitoring (fully completed descriptive features)

		Market integration	Competition Policy	Sector specific regulation	Start-up conditions	Improving the (small) business environment	R&D and Innovation	Education	Total
AT	Indicator value								
	Number of reforms								
BE	Indicator value								
	Number of reforms								
BG	Indicator value			0.71		0.59	0.60		0.63
	Number of reforms			1		1	2		4
CY	Indicator value	0.45	0.71		0.53	0.53	0.63		0.56
	Number of reforms	2	1		4	6	6		19
CZ	Indicator value	0.45	0.45	0.45	0.32	0.32	0.71		0.45
	Number of reforms	1	1	1	1	1	1		6
DE	Indicator value			0.78					0.78
	Number of reforms			5					5
DK	Indicator value		1.00	1.00					1.00
	Number of reforms		1	1					2
EE	Indicator value					0.71	0.71	0.71	0.71
	Number of reforms					1	1	1	3
EL	Indicator value				0.71	0.71	0.71		0.71
	Number of reforms				1	2	3		6
ES	Indicator value		0.71		0.59	0.71	0.32		0.58
	Number of reforms		1		1	1	1		4
FI	Indicator value								
	Number of reforms								
FR	Indicator value					0.71			0.71
	Number of reforms					2			2
HU	Indicator value								
	Number of reforms								
IE	Indicator value	0.71	1.00	0.70	0.72	0.67	0.80	0.66	0.73
	Number of reforms	3	2	5	3	3	2	2	20
IT	Indicator value	0.32		0.32		0.32	0.38	0.85	0.41
	Number of reforms	1		3		4	6	2	16
LT	Indicator value								
	Number of reforms								
LU	Indicator value								
	Number of reforms								
LV	Indicator value	0.71	0.71	0.93	0.67	0.48	0.76	0.71	0.72
	Number of reforms	3	1	4	3	4	9	2	26
MT	Indicator value	0.45		1.00	0.45	0.54	0.63	0.67	0.61
	Number of reforms	1		1	2	3	4	3	14
NL	Indicator value								
	Number of reforms								
PL	Indicator value	0.32	0.59	0.93	0.71	0.67	0.69		0.72
	Number of reforms	1	1	4	1	3	6		16
PT	Indicator value								
	Number of reforms								
RO	Indicator value							0.50	0.50
	Number of reforms							1	1
SE	Indicator value						0.71	0.71	0.71
	Number of reforms						1	1	2
SI	Indicator value					0.71	0.58		0.60
	Number of reforms					1	5		6
SK	Indicator value	0.32	0.32	0.40	0.32	0.45	0.85		0.47
	Number of reforms	1	1	3	1	3	2		11
UK	Indicator value						0.71		0.71
	Number of reforms						2		2
Total	Indicator value	0.54	0.72	0.72	0.58	0.55	0.65	0.70	0.63
	Number of reforms	13	9	28	17	35	51	12	165

Table 17 Indicator on evaluation (fully completed descriptive features)

		Market integration	Competition Policy	Sector specific regulation	Start-up conditions	Improving the (small) business environment	R&D and Innovation	Education	Total
AT	Indicator value						1.00		1.00
	Number of reforms						1		1
BE	Indicator value			0.00					0.00
	Number of reforms			3					3
BG	Indicator value								
	Number of reforms								
CY	Indicator value	0.50	0.50		0.25	0.25	0.75		0.44
	Number of reforms	1	1		2	2	2		9
CZ	Indicator value	0.50			0.50	0.00	0.50	0.50	0.42
	Number of reforms	2			1	1	1	1	6
DE	Indicator value			1.00					1.00
	Number of reforms			1					1
DK	Indicator value		0.50						0.50
	Number of reforms		1						1
EE	Indicator value				1.00	0.00	0.50	0.50	0.50
	Number of reforms				1	1	1	1	4
EL	Indicator value				1.00	1.00	1.00		1.00
	Number of reforms				1	2	2		5
ES	Indicator value		0.50	0.00	0.50		0.50		0.30
	Number of reforms		1	2	1		1		5
FI	Indicator value					1.00			1.00
	Number of reforms					1			1
FR	Indicator value								
	Number of reforms								
HU	Indicator value								
	Number of reforms								
IE	Indicator value	0.00	0.00	0.13	0.33	0.21	0.20	0.33	0.17
	Number of reforms	4	3	8	3	7	5	3	33
IT	Indicator value	0.50		0.25		0.40	0.25	0.50	0.32
	Number of reforms	1		6		5	4	1	17
LT	Indicator value								
	Number of reforms								
LU	Indicator value								
	Number of reforms								
LV	Indicator value	0.00		0.75		0.50	0.50		0.54
	Number of reforms	1		4		3	4		12
MT	Indicator value	0.50		0.75	1.00	0.33	0.42	0.25	0.50
	Number of reforms	1		2	2	3	6	2	16
NL	Indicator value								
	Number of reforms								
PL	Indicator value	0.25	0.50	0.17	0.00	0.30	0.25		0.24
	Number of reforms	2	1	6	1	5	4		19
PT	Indicator value								
	Number of reforms								
RO	Indicator value								
	Number of reforms								
SE	Indicator value						0.75	0.50	0.67
	Number of reforms						2	1	3
SI	Indicator value					0.50	0.70	0.50	0.64
	Number of reforms					1	5	1	7
SK	Indicator value	0.25		0.50	0.25	0.38	0.50		0.36
	Number of reforms	2		1	2	4	2		11
UK	Indicator value					1.00	0.50		0.75
	Number of reforms					1	1		2
Total	Indicator value	0.25	0.31	0.29	0.50	0.37	0.50	0.40	0.39
	Number of reforms	14	8	33	14	35	42	10	156

Table 18 Indicator on comprehensiveness (fully completed descriptive features)

		Market integration	Competition Policy	Sector specific regulation	Start-up conditions	Improving the (small) business environment	R&D and Innovation	Education	Total
AT	Indicator value					0.00	0.68		0.45
	Number of reforms					1	2		3
BE	Indicator value						0.77		0.77
	Number of reforms						2		2
BG	Indicator value			0.00		0.00	0.00	0.00	0.00
	Number of reforms			1		4	1	5	11
CY	Indicator value				0.22	0.56	0.14	0.00	0.20
	Number of reforms				2	2	3	3	10
CZ	Indicator value				0.00				0.00
	Number of reforms				1				1
DE	Indicator value		0.43		0.48	0.51			0.49
	Number of reforms		1		3	3			7
DK	Indicator value	1.00	0.00	0.00		0.84	0.76		0.66
	Number of reforms	1	1	1		2	6		11
EE	Indicator value							0.00	0.00
	Number of reforms							1	1
EL	Indicator value				0.43	0.43	0.43	0.43	0.43
	Number of reforms				1	1	2	1	5
ES	Indicator value				0.86	0.86	0.67		0.79
	Number of reforms				5	6	6		17
FI	Indicator value					0.00			0.00
	Number of reforms					1			1
FR	Indicator value					0.00	0.00		0.00
	Number of reforms					2	1		3
HU	Indicator value								
	Number of reforms								
IE	Indicator value		0.40			0.00			0.32
	Number of reforms			3		1			4
IT	Indicator value	0.43		0.11		0.00	0.19	0.20	0.14
	Number of reforms	1		6		5	9	2	22
LT	Indicator value								
	Number of reforms								
LU	Indicator value								
	Number of reforms								
LV	Indicator value				0.21				0.21
	Number of reforms				2				2
MT	Indicator value				0.00	0.22	0.00		0.05
	Number of reforms				2	2	4		8
NL	Indicator value								
	Number of reforms								
PL	Indicator value			0.43		0.67	0.86		0.66
	Number of reforms			1		3	1		5
PT	Indicator value						0.00		0.00
	Number of reforms						3		3
RO	Indicator value						0.00		0.00
	Number of reforms						1		1
SE	Indicator value								
	Number of reforms								
SI	Indicator value					0.00	0.83	0.00	0.53
	Number of reforms					3	7	1	11
SK	Indicator value						0.00		0.00
	Number of reforms						2		2
UK	Indicator value						0.00		0.00
	Number of reforms						1		1
Total	Indicator value	0.72	0.22	0.20	0.44	0.34	0.42	0.07	0.35
	Number of reforms	2	2	12	16	36	50	13	131

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Abstract

In order to track the reform efforts in the framework of the (renewed) Lisbon Strategy the MICREF database was created. The Joint Research Centre (JRC Ispra) supported Directorate General Economic and Financial Affairs (DG ECFIN) and Directorate General Enterprise and Industry (DG ENTR) in the creation and the filling of the database and developed analytical tools based on the data contained in the MICREF database. The objective of these tools is to support the investigation of the reform activity and the reform characteristics in the microeconomic area. The indicators proposed in the present report are mostly based on the descriptive features of the database and try to shed light on reform characteristics such as the speed of implementation, the involvement of stakeholders or monitoring procedures.

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