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When do countries implement structural reforms?

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When do countries implement structural reforms?

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Abstract

The objective of this paper is to investigate which factors - macroeconomic, policy-related or institutional - foster the implementation of structural reforms. To this objective, we look at episodes of structural reforms over three decades across 40 OECD and EU countries and link them to such factors. Our results suggest that structural reforms implementation is more likely during deep recessions and when unemployment rates are high. Moreover, the further distant from best practices, the more likely a country implements reforms. External pressures, such as being subject to a financial assistance programme, or being part of the EU Single Market facilitated pro-competitive reforms. If at all, low interest rates tend to promote rather than discourage structural reforms, while there seems no clear link between fiscal policy and reforms. Moreover, reforms in product markets tend to increase the likelihood of labour market reforms following suit. Many robustness checks have been carried out which confirm our main results.

JEL classification: C23, D70, D72, P11, P16

Keywords: political economy, structural reforms, linear probability model, panel data

Non-technical summary

Despite the prevailing consensus that structural reforms would generate long-term growth benefits, in the recent past we have observed only few countries embarking in major reform efforts. Against this background, this paper investigates empirically which macroeconomic, institutional and policy factors are associated with the implementation of reforms. We look at episodes of “major” structural reforms and test the relevance of many variables which could potentially explain the different reform patterns across countries. The identification of reforms and the empirical model used is in line with the previous, though still scarce, literature on the topic. Yet, we add to the literature by, first, expanding the set of explanatory variables, in particular also looking at the role of monetary policy and a broader set of variables aimed at measuring external pressure to reforms. Furthermore, we use an exceptionally large panel dimension looking at 40 OECD and EU countries between 1975 and 2013. Moreover, to our knowledge, this is the first paper with a clear focus on EU and euro area countries for various reform areas. In addition, we add to the empirical literature, by not only relying on one measure of reforms but two, thereby testing the sensitivity of our results to changes in the identification of reforms. In the same vein, we conduct a battery of econometric robustness checks using a wide set of empirical approaches linking episodes of reform to various explanatory variables.

Focussing on reforms in the areas of product markets, labour markets, framework conditions and barriers to foreign direct investment (FDI), we derive the following main results: structural reforms implementation, in particular on labour markets, is more likely during (deep) recessions and when unemployment rates are high. If a country is expected to have high potential growth in the future, this seems to reduce the pressure for reforms. The initial structural conditions of a country constitute an important driver for structural reforms across all four areas analysed.

External pressures, such as being subject to a financial assistance programme, facilitate reform implementation. But over our sample period and for the countries covered, financial market pressure (e.g. through higher sovereign bond spreads) is not associated in a significant way to higher reform pressures. Our results show that the EU Single Market facilitated pro-competitive reforms in various national product markets.

In terms of fiscal policies, depending on the area of reform, the fiscal stance is positively or negatively correlated with the reform stance. Product market and FDI-regulation-related reforms seem less associated with times of fiscal consolidation, while the opposite is true for labour market reforms. Turning to monetary policy, contrary to the frequent claim, low interest rates tend to promote rather than discourage structural reforms. This might be explained by the additional room for redistributive policies during periods of low interest rates, which in turn could offset potential short term costs arising from reforms for certain parts of the population.

Results on the importance of the political environment are mixed. Having one party with majority in all houses increases the likelihood of reform implementation. By contrast, the proximity to national elections or the political orientation of the government do not appear to influence reform implementation. In terms of sequencing of reforms, past reforms in product markets tend to be associated with an increased likelihood of labour market reforms following suit. This outcome is in line with the expectation that the former increases new firm entry, overall activity and thereby an expansion of labour demand; lower rents are also likely to reduce resistance to labour market reforms.

For euro area countries the factors associated with reforms are broadly similar to those obtained for all OECD and EU countries. However the unemployment rate and the advantage of lower interest rates seem even more important triggers of reform.

1. Introduction

Structural reform implementation has remained sluggish in most euro area countries during the past years. This has been the case despite the economic structures in most euro area countries still being far from best practices and despite a vast existing literature showing that in the long run high quality economic institutions and economic structures are beneficial for per capita income and shock absorption capacity.¹

The literature on the political economy of reforms tries to understand the reasons behind the observed disconnect between the perceived widespread resistance to reforms and their beneficial effects. One strand of the literature, related to manipulation of state variables, argues that governments may pursue policies that are not welfare enhancing if that increases their chance of re-election (e.g. Aghion and Bolton, 1990; Milesi-Ferretti and Spolaore, 1994; Saint-Paul et al., 2015). Another, focuses on the resistance, or *status quo bias*, which has been often associated with the perceived unequal distribution of the costs and benefits of reforms (e.g. Fernandez and Rodrik, 1991; Ciccone, 2004). The costs may arise from the different impact across various sectors of the economy of relative price and cost changes and from transitional unemployment effects for some groups. Because short-term costs are generally perceived to be higher for the insiders or the protected groups, the approach of reforms is often piecemeal and tends to protect acquired rights (grandfathering). However, a piecemeal approach to reform implementation reduces the impact of the reform and an excessive use of grandfathering might lead to a short-term bias against reforms by the outsiders, given that already highly protected people are shielded by the uncertainty associated with the change. Moreover, benefits of reforms usually come with some delay and are therefore often hard to anticipate, not contributing to reducing resistance to reform implementation.

In this light, this paper seeks to link structural reforms with domestic and external factors which could support their implementation. We focus on four main areas of reform: labour market, product market, framework conditions and FDI restrictions. Building on and expanding the analysis of the existing literature, we look at a large number of possible determinants of reform implementation, covering the macroeconomic environment (both current and projected), the initial structural conditions, fiscal and monetary policies, the political situation (e.g. whether a government has sufficient support in the parliament), the external influence (covering financial markets but also institutional arrangements such as the EU Single Market legislation), demographics, as well as the sequencing of reforms.

The identification of reforms and the empirical model used is in line with the previous, yet still scarce, literature on the topic (e.g. Duval and Elmeskov, 2006). We add to the literature (see Section 3 for an overview) in four respects. First, we expand the set of explanatory variables, in particular also looking at monetary policies or a broader set of variables gauging external pressure to reform. Second, we use an exceptionally large panel dimension looking at up to 40 OECD and EU countries over three decades. Third, we focus on the euro area countries looking at a variety of reform areas. Fourth, we rely on two measures of reforms, which test the sensitivity of our results to changes in the identification of reforms, and conduct a battery of robustness checks using different estimation methods, different sample compositions and testing the importance of various explanatory variables.

The paper is organised as follows. The next section discusses the identification of reforms and presents descriptive statistics of major reforms. Section 3 includes a literature review and more broadly linking reforms

¹ See e.g. Acemoglu, 2003; Masuch et al., 2016; Sondermann, 2016.

to various drivers in the economy. Section 4 presents the econometric models and discusses the results, while Section 5 will cover a battery of robustness checks. Section 6 concludes.

2. Identification of structural reforms

Measuring structural reforms in a consistent manner across time and countries is a challenging task. There are no databases available which comprehensively collect structural reforms for various areas and in particular not in a consistent manner across countries and years.² For this reason, some literature focuses on case studies (e.g. Tompson and Dang, 2009). While that approach has the advantage of providing a detailed analysis of the context in which a reform was implemented, it comes at the cost of remaining descriptive. Instead, we use structural indicators collected by international institutions, which measure different aspects of structural and institutional quality in a harmonised manner allowing for quantitative analysis across countries. Our empirical approach is in line with other literature which tries to test econometrically the relevance of different factors in determining reforms (e.g. Høj et al., 2006)³.

The four main areas of reform analysed are: labour market, summarised with the OECD Employment Protection Legislation (EPL) indicator; product market, looked at through the lenses of the OECD indicator of regulation on energy, transport, communications (ETCR) indicator; business environment, calculated by the World Bank Doing Business Indicator (DBI) as well as the OECD measure of barriers to foreign direct investment (FDI). These indicators have the advantage of having a transparent methodology and are common to all countries, which allow computing a standardized measurement of reform effort across countries.

Reforms are identified by looking at annual changes of the underlying indicators. In the first instance, we only select large changes of the index as a reform, as we intend to capture major reform efforts and not small changes in legislation that might take place as a reaction to a major reform. As a result, we define as reform the change of the indicator larger than two standard deviations of the changes over all observations (see e.g. Duval and Elmeskov, 2006).⁴ Yet, we also conduct robustness checks with somewhat different standard deviations (e.g. 1.5 or 2.5). A second identification strategy relies on simple (positive and negative) annual changes of the indicators.⁵

Chart 1 shows the reform intensity (used in the benchmark model) by decades for selected euro area countries in the area of product and labour markets. It shows that the reform intensity has increased significantly in the period between 1996 and 2004 and fallen afterwards. It also suggests that there has been significant heterogeneity across the euro area countries within the three decades.

² Some databases exist for shorter samples, such as the LABREF database maintained by DG EMPL of the European Commission.

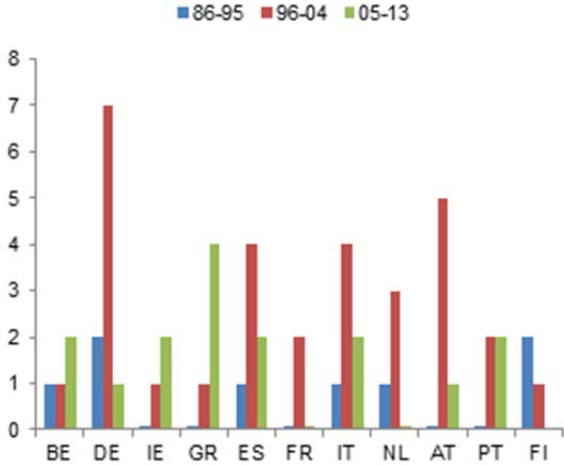
³ One exception in the literature is Duval et al., 2016, who manually went through all OECD Economic Studies of past decades and chose a reform depending on the content of OECD reports.

⁴ A concrete comparison of reform episodes identified across studies is complicated given the different samples used as well as differing methods of identification, and given that most econometric papers don't tend to list the concrete numbers of reforms identified.

⁵ Only in the case of the ETCR a correction was necessary to ensure that the annual changes are likely due to actions of the government rather than driven by other factors. The ETCR methodology (see Convey and Nicoletti, 2006) is based on a set of detailed questions describing changes to the regulation in the respective sectors of energy, transport and communications. While the changes in the index most often relate to policy changes, it also occurs that smaller changes are due to factors outside of the control of the government, such as coverer in the question on "What is the market share of new entrants in the international telephony market". Small changes of the ETCR are therefore set to zero for the regressions.

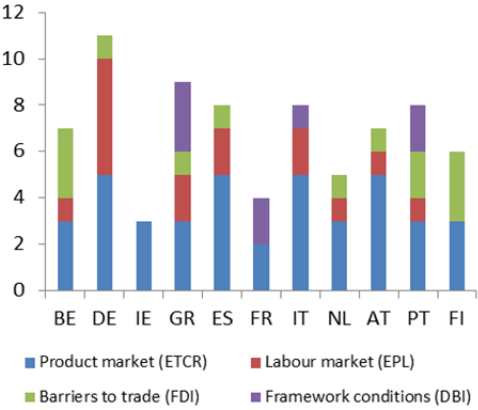
Chart 2, in turn, depicts the aggregate number of large reforms by country across the overall time span of our sample. It should be noted, though, that the different sample periods of the four indicators of reforms, does not allow a meaningful comparison among reform areas, but only for each type of reforms across countries.

Chart 1: Number of large reforms in labour and product markets in euro area countries over time



Sources: ECB calculations based on OECD EPL and ETCR indicators. Note: Due to data limitations across indicators, reforms are only shown for 11 euro area countries. Reforms are cases in which the change of the underlying index exceeds twice its standard deviation.

Chart 2: Number of large reforms across all four areas in euro area countries (1985-2013 for EPL, 1975-2013 for ETCR, 1997-2015 for FDI restrictiveness, and 2003-2015 for Doing Business)



Sources: ECB calculations based on OECD EPL and ETCR, WB Doing Business and OECD FDI restrictiveness indicators. Note: Due to data limitations across indicators of reforms only shown for 11 euro area countries. Reforms are cases in which the change of the underlying index exceeds twice its standard deviation.

The chart shows that in the past 20 years, Ireland has been the least reforming country in terms of labour market, framework conditions and barriers to FDI. This is likely due to the fact that many reforms have taken place in the 1980s, which brought Ireland close to the frontier of well-functioning economic structures in various areas. Focusing on labour market reforms, in the period 1985-2013 Germany has been the country with the strongest reform intensity, followed by Greece, Spain and Italy. In the period 1997-2015 reform intensity on reducing FDI barriers has been strongest in Finland and Belgium, while in the period 2003-15 Greece has been the country registering the highest reform intensity in improving framework conditions.

3. Literature review of the conditions associated to structural reforms

A large set of factors could impact the likelihood of implementing structural reforms, both relating to domestic and external forces. On the domestic side this includes the current state of economic structures and underlying regulations (initial structural conditions), macroeconomic conditions, fiscal and monetary policies and the general political environment. However, a country could also be pressured by external sources to undertake reforms.

The initial structural conditions should have a significant bearing on the need to undertake reforms. A country far away from best-practices in the respective policy areas will still need to undertake greater reform efforts to improve the functioning of its institutions, compared to a country closer to the frontier (Bonfiglioli and Gancia, 2016). To capture the initial structural conditions, we use the lagged level of the underlying structural indicator in our regressions.

Moreover, the urgency to act is likely to significantly increase in dire economic situations. In the literature this has been related to the fact that in the presence of pronounced losses in economic welfare during deep recessions (Drazen and Easterly, 2001; Tompson and Price, 2009; Bonfiglioli and Gancia 2016; Agnello et al., 2015; Duval et al., 2016) and during episodes of high unemployment (Duval and Elmeskov, 2006; Duval et al., 2016) the costs of the *status quo* are more visible and the resistance to change is reduced. To capture the adverse macroeconomic conditions, we use the unemployment rate and a measure of the depth of a recession by constructing a variable which only takes negative real GDP growth rates (see Annex Section 8.1 for a detailed description of all variables used in the regressions).

The influence of the current political landscape could matter as well. In particular there is a widespread belief that the electoral cycle should lead to fewer reforms (in particular those which are likely to exhibit short-term costs) in the proximity of an election. By contrast, newly elected governments might be most inclined to implement reforms given the distance to the next elections (Alesina et al., 2006; Duval, 2008). Similarly, reforms are more easily implementable if one party has the necessary majority in all houses of the parliament. We use respective dummy variables from the database of Political Institutions which includes all OECD and EU countries over the entire sample period.

Also the current fiscal and monetary policy could have a bearing on the structural reform stance. The direction of the link between fiscal consolidation or the level of short-term interest rates, as affected by monetary policy, and structural reforms is however somewhat unclear *ex ante*. On the one hand, a reform-minded government might use the times in which it manages to improve its fiscal-structural balance to also undertake reforms in other areas. On the other hand, the political capital could only last for actions in either of the two areas, i.e. reducing the likelihood of structural reforms during times of fiscal consolidation (Duval and Elmeskov, 2006). To test for this we look at the change of the structural balance, as a measure of fiscal stance, in our regressions.

Moreover, in terms of monetary policy, lower interest rates could increase the room for manoeuvre of governments which tend to be less budget-constrained and tend to face a quicker recovery of demand both allowing measures to offset the short-term costs of reforms (Gordon, 1996). On the other hand, lower short-term yields, by reducing longer maturity government bond yields, ease market access of highly indebted countries, and thereby might reduce external pressure on governments to undertake reforms. We include short-term interest rates in our model to test if there is a correlation between lower interest rates and reform intensity.

External pressures could come from financial markets, or by being obliged to reform due to intra-governmental agreements or from being under a financial assistance programme. The euro area sovereign crisis has shown that loss of confidence of financial market actors and international investors leads to sharp increases of bond yields, followed by rating agencies downgrades. Moreover, the sovereign crisis has been catalyst for reforms in the countries that asked for financial assistance. In view of this evidence, it is interesting to test for a larger sample of countries and longer sample period the extent to which financial assistance programmes mattered. Moreover, being part of EMU, member states enjoy access to e.g. the EU Single Market, which however also obligates to implement EU Directives into national law (Tompson and Price, 2009; Bonfiglioli and Gancia, 2016)⁶.

⁶ See Annex Section 8.1 for a definition of the respective financial assistance programmes and the Single Market dummy in our regressions.

Smaller and more open countries might be in need to undertake more reform than larger countries. Given that smaller countries are commonly strongly relying on external trade, they face stronger international competition which in turn puts more pressure on the government to create efficient economic structures which allow competing with other peers (Gomez et al., 2011; Saint-Paul, 2004). We use trade openness as an empirical proxy (see Annex Section 8.1 for a definition).

Quickly ageing societies might tend to object more frequently to reforms than younger economies. Should the country exhibit a high old-age dependency ratio, the significant part of older people might object to reducing labour market flexibility or changing the pension system, as they might find it harder to adapt to changing economic structures (Heinemann, 2004). We use the old-age dependency ratio to account for this factor.

Social partners have also a role in the reform process in many countries. With a view to assessing the importance of social partners in the reform implementation we control for the existence of a social pact. One would expect that a country that concluded recently a social pact could be more likely to implement reform (e.g. Baccaro and Lim, 2007).

The right sequencing could also promote the implementation of reforms, as certain reforms are able to offset the short-term costs of other policy actions. In particular, product market liberalisation could precede labour market reforms. This could be explained with pro-competitive product market reforms reducing market power, facilitating the entry of new firms, in turn promoting higher economic activity and labour demand (e.g. Høj et al., 2006; Nicoletti and Scarpetta, 2005; Blanchard and Giavazzi, 2003). In this respect, product market reforms could improve the conditions for achieving an easing of EPL rules as they boost employment opportunities, thereby reducing the incentives for incumbent workers to protect their jobs through strict EPL rules (Koeniger and Vindigni, 2003).

4. Econometric model and results

4.1 Methodology

The model specification employs a panel approach to investigate the role of various possible drivers across countries. The model takes the following form:

$$(1) \text{REF}_{i,t} = \alpha + \beta_1 \text{STR}_{i,t-1} + \beta_2 \text{MAC}_{i,t-1} + \beta_3 \text{MPOLS}_{i,t-1} + \beta_4 \text{POL}_{i,t-1} + \beta_5 \text{EXT}_{i,t-1} + d_i + \varepsilon_{i,t}$$

whereas we regress the reform stance indicator (*REF*), for country *i*, in year *t*, on a set of lagged variables, including: (i) *STR*, the initial structural conditions, (ii) various proxies for the macroeconomic environment, *MAC* (such as the existence of a recession, the unemployment rate or potential growth five years ahead), (iii) macroeconomic policies (including fiscal and monetary policies; *MPOLS*), (iv) the political environment (*POL*), e.g. whether a government has sufficient support in the parliament, (v) the external influence (*EXT*), covering financial markets but also institutional arrangements such as the EU Single Market legislation or financial assistance programmes; α , a common intercept and d_i , a country fixed effect.⁷ We also use time fixed effects as part of the battery of robustness checks.

⁷ As noted above, country fixed effects are used as one possible specification, as tests on their relevance are mixed. Country fixed effects should cover other determinants or reform implementation, which for example relate more to the quality of basic political institutional variables.

We start by using pooled OLS or fixed effects panel models in various forms, as suggested by relevant econometric tests (Hausman and Breusch-Pagan Lagrange multiplier test). For the binary variable of the large reform indicator, in the first instance, we use linear probability models (LPM) for two reasons. First, given the straightforward interpretation, and second, because the use of logit and probit models produces the well-known incidental parameter problem when using fixed effects. For the non-fixed effects regression, we however cross-check our results of the LPM with a logit approach (see Table 10 in the Annex). For the estimations using the continuous change we apply pooled OLS and fixed effects panel estimations. The chosen econometric approach is in line with the literature, such as Høj et al. (2006) or Bonfiglioli and Gancia (2016). Yet, we add a series of robustness checks to test for the sensitivity of our results to changes in the econometric specification. For example, as a robustness check and considering the potential endogeneity of the initial conditions variable (i.e. the level of the underlying structural indicators of OECD and World Bank), we estimate the model using instrumental variables (Two-Stage Least Squares) approaches. In addition, we estimate the model via system GMM allowing for endogeneity not only of the initial condition but also the macroeconomic variables which include the depth of the recession, the unemployment rate, potential growth, change in structural adjusted fiscal deficit and the interest rate.

All explanatory variables in our specifications are lagged by one year to account for lags in the transmission of the various factors influencing governments' decision making process. In this way, we also reduce the risk of potential reverse causation problems. A further argument for using one lag consistently throughout the regressions is to create a sufficient distance to the reforms given the unknown exact timing of the reforms within the given year. We also include a time trend in all regressions to account for possible non-stationarity of the regressors.

4.2 Results

Table 1 and Table 2 show the results of the main specifications. As noted in Section 2, to test the sensitivity to our main reform measure (Table 1), we also rely on the annual change of the indicators (Table 2). The use of two different approaches to reform identification is an important robustness check of our results and adds to the existing empirical literature. Interestingly, results are overall relatively robust to the choice of the identification method.⁸ They are also robust to somewhat different choices of standard deviations for the selection of larger reforms. We tried with 1.5 and 2.5 standard deviations and find that our results hardly vary.

The results of the main specifications, as depicted in Tables 1 and Table 2, indicate that the macroeconomic environment tends to impact reform implementation. The depth of recession, the unemployment rate and potential growth all tend to be linked to the implementation of reforms.⁹ The depth of the recession, which only takes into account recessions (although in absolute terms), increases the probability of large EPL reforms and reforms reduce FDI restrictiveness. The results for large reforms are comparable to those obtained in Table 2 for continuous changes in the structural indicators.

Overall, reforms in EPL or FDI restrictiveness, as measured by improvements of their respective indicators, seem to take place more often during recessions than during periods of positive growth. The results are

⁸ Despite the different approach in identifying reforms the results are also very close to Duval et al. (2016) who select reforms mainly based on reading OECD Economic Reviews for the respective country and coding reforms manually.

⁹ See definition of all variables follows the descriptions in Section 3 as also elaborated on in more detail in Annex 7.1.

consistent with the finding that national governments seem more inclined to undertake reforms in dire economic times (in line with e.g. Tomassi and Velasco, 1996; or Drazen and Easterly, 2001).

Table 1: Drivers of structural reform implementation (episode definition)

	EPL		ETCR		DBI		FDI	
	FE	pOLS	FE	pOLS	FE	pOLS	FE	pOLS
Depth of recession	0.011* (0.007)	0.012* (0.007)	-0.008 (0.011)	-0.012 (0.011)	0.009 (0.007)	0.005 (0.007)	0.040*** (0.006)	0.037*** (0.006)
Unemployment rate	0.013*** (0.004)	0.006*** (0.002)	-0.001 (0.007)	0.006 (0.004)	-0.002 (0.006)	0.002 (0.004)	-0.003 (0.005)	0.002 (0.003)
Potential growth	-0.017** (0.008)	-0.008 (0.006)	-0.001 (0.011)	0.006 (0.010)	-0.015 (0.011)	-0.016** (0.008)	0.002 (0.008)	-0.003 (0.007)
Chg. structural balance	0.012** (0.005)	0.015*** (0.005)	-0.002 (0.007)	-0.003 (0.007)	-0.015* (0.008)	-0.017** (0.008)	-0.013** (0.006)	-0.014** (0.006)
Short-term interest rate	-0.002 (0.003)	-0.004** (0.002)	-0.003 (0.004)	-0.002 (0.003)	-0.009 (0.007)	0.003 (0.005)	-0.015*** (0.003)	0.001 (0.003)
Programme dummy	0.183*** (0.050)	0.140*** (0.044)	-0.061 (0.077)	-0.059 (0.072)	0.112** (0.051)	0.132*** (0.043)	-0.033 (0.046)	0.016 (0.040)
Majority in all houses	0.014 (0.028)	-0.005 (0.020)	0.100** (0.044)	0.078** (0.033)	-0.060 (0.055)	-0.019 (0.029)	-0.025 (0.033)	-0.024 (0.024)
Single market dummy			0.145*** (0.049)	0.082*** (0.031)				
EPL initial conditions	0.081*** (0.017)	0.007 (0.005)						
ETCR initial conditions			0.113*** (0.036)	-0.005 (0.018)				
DBI initial conditions					-0.032*** (0.007)	-0.011*** (0.002)		
FDI initial conditions							2.052*** (0.363)	0.212 (0.147)
Intercept	-3.114 (3.604)	2.011 (2.715)	-15.946 (10.355)	6.468 (5.691)	-20.236* (10.888)	-3.534 (7.734)	2.509 (4.955)	6.191 (4.295)
r2	0.098	0.067	0.034	0.029	0.079	0.138	0.137	0.080
N	634	634	723	723	455	455	586	586

Source: ECB calculations. Note: *p<0.1; **p<0.05; ***p<0.001. Standard errors are reported in brackets.

The table shows the result of linear probability panel models (fixed effect and pooled OLS). Dependent variable equal to 1 if a large reform is implemented and 0 otherwise. A time trend is included in all regressions and all variables are lagged by one period. The depth of recession contains a zero if GDP growth is positive and is equal to the absolute actual GDP growth rate if negative. The potential growth is 5 years ahead. The programme dummy equals one if in this year an IMF (or EU) programme existed for the country. The majority in all houses dummy is one if a one party government during the respective year had the majority in all necessary chambers of the parliament. The single market dummy is 1 for all countries part of the Single Market (i.e. 1993 or later such as for all EU accession countries). The sample covers all OECD countries, although depending on the availability of the respective indicators. The sample period spans from 1985-2013 for EPL, from 1975-2013 for ETCR, from 1997-2015 for trade barriers, and from 2003-2015 for Doing Business. The initial condition variables are the lagged underlying levels of the respective index.

Also higher unemployment rates have a positive impact on reform implementation (in line with Duval et al., 2016) even after controlling for recessions. Higher unemployment rate appears to positively impact in particular reforms in the area of employment protection. Results are statistically non-significant for the other three areas of reform. The third variable related to the macroeconomic environment concerns potential growth, which measures the expected potential growth 5-years ahead. The results suggest that countries with relatively high potential growth going forward are less likely to implement reforms in the areas of labour, product markets and business conditions. This result is consistent with that obtained for recession and unemployment and shows that countries facing higher growth potential seem less pressured by domestic or

external stakeholders to undertake reforms, given that their higher adjustment capacity and competitiveness is expected to translate into a quicker and less costly recovery.

Table 2: Drivers of structural reform implementation (change of indices)

	EPL		ETCR		DBI		FDI	
	FE	pOLS	FE	pOLS	FE	pOLS	FE	pOLS
Depth of recession	-0.020** (0.008)	-0.019** (0.008)	0.005 (0.005)	0.007 (0.005)	0.025 (0.024)	0.005 (0.023)	-0.107*** (0.028)	-0.103*** (0.031)
Unemployment rate	-0.013** (0.005)	-0.003 (0.003)	-0.003 (0.003)	-0.003 (0.002)	0.003 (0.020)	0.015 (0.012)	0.007 (0.021)	-0.018 (0.014)
Potential growth	0.017* (0.009)	0.009 (0.007)	-0.001 (0.005)	-0.008* (0.004)	-0.093*** (0.035)	-0.050* (0.026)	0.025 (0.036)	0.016 (0.032)
Chg. structural balance	-0.006 (0.006)	-0.010* (0.006)	0.004 (0.003)	0.002 (0.004)	0.003 (0.026)	-0.007 (0.026)	0.014 (0.028)	0.024 (0.031)
Short-term interest rate	0.004 (0.003)	0.007*** (0.002)	0.002 (0.002)	0.002 (0.001)	-0.040* (0.024)	0.010 (0.015)	0.073*** (0.015)	-0.007 (0.012)
Programme dummy	-0.240*** (0.059)	-0.200*** (0.051)	0.016 (0.034)	0.021 (0.032)	0.376** (0.169)	0.431*** (0.146)	-0.282 (0.204)	-0.678*** (0.196)
Majority in all houses	-0.058* (0.033)	-0.034 (0.024)	-0.042** (0.020)	-0.026* (0.015)	-0.118 (0.180)	-0.240** (0.098)	-0.128 (0.147)	-0.016 (0.115)
Single market dummy			-0.127*** (0.023)	-0.042*** (0.015)				
EPL initial conditions	-0.126*** (0.020)	-0.026*** (0.006)						
ETCR initial conditions			-0.107*** (0.016)	-0.039*** (0.008)				
DBI initial conditions					-0.126*** (0.023)	-0.051*** (0.007)		
FDI initial conditions							-0.220*** (0.016)	-0.053*** (0.007)
Intercept	3.197 (4.192)	-7.459** (3.149)	10.771** (4.555)	0.888 (2.598)	-79.600** (35.966)	-15.514 (26.197)	30.432 (22.068)	-39.737* (20.779)
r2	0.121	0.092	0.122	0.075	0.100	0.185	0.317	0.183
N	634	634	753	753	455	455	586	586

Source: ECB calculations. Note: *p<0.1; **p<0.05; ***p<0.001. Standard errors are reported in brackets. The table shows the result of fixed effect and pooled OLS models, having as dependent variable the year-on-year change in the respective policy indicator. For the EPL, ETCR and FDI a reform is a decrease in the indicator. Whereas for the DBI indicator, which is scaled conversely to the EPL, ETCR and FDI indices, an increase is interpreted as a reform. In the case of the ETCR, given its construction, very small changes of the indicator were considered no reform. For definition of the variables compare notes in Table 1.

Turning to how the fiscal policy correlates with reform implementation, our results do not show a clear pattern. We use as a proxy for the fiscal policy stance the change in the structural balance. Table 1 (and Table 2) show that business conditions and restrictions to FDI are less likely to be reformed when fiscal policy is contractionary. The results seem to suggest that the political capital needed to engage in fiscal consolidation is then missing for such kind of policy actions. By contrast, labour market reforms are undertaken when the government is already engaged in fiscal consolidation. As a robustness check, we analysed how the level of government debt was affecting reform implementation, but results turned out not statistically significant in all specifications.

In addition, our results do not show evidence that low interest rates hamper reform implementation. If at all, Table 1 and Table 2 show that the lower the nominal short-term interest rate¹⁰, the higher the likelihood of

¹⁰ The inclusion of the inflation rate as a control variable does not change the overall picture.

reform implementation in particular in the areas of labour markets, framework conditions and trade. This could be read as the anticipated positive effect of lower rates on the budget (through lower state financing costs) or on growth and jobs, in turn, offering more room for manoeuvre for policy makers to compensate the part of the population affected by the change brought about by reforms. It might be argued that the negative coefficient of interest rates is just another indicator of adverse macroeconomic conditions. However, given that we simultaneously control for the occurrences of crisis, the coefficient of interest rates should be seen as marginal effect on top of the effects stemming from adverse economic conditions.

A strong government seems to be conducive to more reforms. Table 1 and Table 2 show that the presence of one party government with majority in all relevant houses generally increases the probability of reforms in various areas (in line with Alesina et al., 1998). The results appear more robust for reforms in the areas related to labour markets and product markets, whereas for framework conditions they appear to have a negative effect. However, other factors, such as upcoming elections or the political ideology of the government did not turn out significant in our regression analysis. This finding is in line with the literature (e.g. Agnello et al., 2015; Bonfiglioli and Gancia, 2016; Duval and Elmeskov, 2006), although somewhat counter-intuitive given the pivotal role one would assume elections have for policy makers to undertake reforms. The fact that the majority in all houses tends to be particularly important for deregulating network industries suggests that vested interest are more easily overcome this way.

External pressures increase the momentum for structural reforms. While reforms are decided upon by domestic politicians, external actors might exert an influence on the implementation of policy measures. Table 1 and Table 2 seem to suggest that financial assistance programmes or the European directives in the context of the Single Market have put pressure on national governments to implement reforms in product markets (similar to Tompson and Price, 2009; Bonfiglioli and Gancia, 2016).

By contrast, financial markets seem after all to exert less pressure on the government to undertake reforms. At least, throughout our regressions, neither the sovereign bond spreads nor the decision of rating agencies turned out as a significant predictor of structural policy actions.

The initial structural conditions at the time of the reform are found particularly important for the likelihood of policy actions. Table 1 and Table 2 show a negative sign between the level of the structural indicator and its subsequent change. The more a country is distant from the frontier, the greater the pressure to undertake measures to reduce the gap (in line with Bonfiglioli and Gancia, 2016; Heinemann, 2004). Countries with larger gaps from the frontier tend to implement more reforms than countries closer to best practices, where the need for further actions was less pressing.

Finally, product market reforms tend to pave the way for labour market reforms. Table 3 shows that product market reforms implemented with a two year lag tend to increase the likelihood of labour market reforms (in line with Brandt et al., 2005 and Høj et al., 2006). This is in line with the argument that product market reforms would improve the conditions for achieving an easing of EPL rules as they boost overall employment opportunities by facilitating new firm entries (e.g. Høj et al., 2006 or Blanchard and Giavazzi, 2003).

At the same time product market reforms reduce rents and thereby likely reduce resistance to labour market reforms (Saint-Paul, 2000). It should be noted though that this is only found for the overall sample of OECD and EU countries, whereas the estimates are not significant for euro area countries alone. This suggests that euro area countries might not have exploited the advantages of the right sequencing of reforms sufficiently. In terms

of the reverse directions, we don't find that (larger) labour market reforms tend to increase the chances of product market reforms following suit.

Table 3: The sequencing of reforms

	EPL				ETCR			
	episode definition		change definition		episode definition		change definition	
	FE	pOLS	FE	pOLS	FE	pOLS	FE	pOLS
Depth of recession	0.012*	0.013*	-0.021***	-0.019**	-0.009	-0.013	0.005	0.007
	(0.007)	(0.007)	(0.008)	(0.008)	(0.014)	(0.014)	(0.006)	(0.006)
Unemployment rate	0.013***	0.006**	-0.013**	-0.002	0.000	0.005	-0.006*	-0.004*
	(0.004)	(0.002)	(0.005)	(0.003)	(0.008)	(0.004)	(0.003)	(0.002)
Potential growth	-0.017**	-0.007	0.017*	0.008	-0.003	0.008	0.004	-0.005
	(0.008)	(0.006)	(0.009)	(0.007)	(0.014)	(0.011)	(0.006)	(0.005)
Chg. structural balance	0.013**	0.016***	-0.007	-0.011*	-0.006	-0.007	0.005	0.004
	(0.005)	(0.005)	(0.006)	(0.006)	(0.010)	(0.009)	(0.004)	(0.004)
Short-term interest rate	-0.002	-0.004*	0.003	0.007***	-0.005	-0.002	0.003	0.002
	(0.003)	(0.002)	(0.003)	(0.003)	(0.005)	(0.004)	(0.002)	(0.002)
Programme dummy	0.173***	0.131***	-0.231***	-0.195***	-0.037	-0.032	0.012	0.002
	(0.051)	(0.045)	(0.059)	(0.052)	(0.090)	(0.082)	(0.036)	(0.033)
Majority in all houses	0.010	-0.009	-0.055*	-0.027	0.150***	0.112***	-0.057***	-0.029*
	(0.028)	(0.021)	(0.044)	(0.033)	(0.050)	(0.038)	(0.021)	(0.016)
Single market dummy					0.126**	0.071**	-0.104***	-0.031**
					(0.057)	(0.035)	(0.025)	(0.015)
EPL initial conditions	0.084***	0.009*	-0.129***	-0.028***				
	(0.017)	(0.005)	(0.020)	(0.006)				
ETCR initial conditions					0.121***	-0.024	-0.092***	-0.025***
					(0.043)	(0.021)	(0.018)	(0.009)
Sequencing of reforms								
Product Market Reform (in t-2)	0.050**	0.056**	-0.049*	-0.046*				
	(0.024)	(0.024)	(0.028)	(0.027)				
Labour market reform (in t-2)					0.052	0.036	-0.008	-0.014
					(0.064)	(0.063)	(0.027)	(0.026)
Intercept	-3.651	1.653	3.718	-7.348**	-7.312	21.109***	1.936	-8.304***
	(3.642)	(2.745)	(4.242)	(3.191)	(12.476)	(7.118)	(4.986)	(2.937)
r2	0.105	0.076	0.126	0.097	0.051	0.047	0.155	0.118
N	622	622	622	622	588	588	618	618

Source: authors' calculations. Note: *p<0.1; **p<0.05; ***p<0.001. Standard errors are reported in brackets. The table shows the result of fixed effect and pooled OLS models, having as both using the episode definition (see Table 2) and the change definition (see Table 3). For definition of all variables compare notes in Table 1.

Other possible determinants identified in Section 3 were not found to explain the pattern of past reforms. For example, demographics didn't seem to have been a significant drag on reform implementation. The old-age dependency ratio was not significant in our estimation.

Moreover, also more open economies didn't seem to be under pressure significantly more than other countries to do reforms. Our proxy of trade openness (exports and imports over GDP) was not able to explain reform implementation across OECD countries (in line with what Høj et al., 2006, find).

We have also tried to address the role of social partners and the social dialogue in driving reform. We looked in particular at the social pacts and how reforms evolved after the conclusion of such pacts. We have not found plausible results and therefore we exclude that area of analysis as we think that its complexity would deserve a separate analysis (e.g. Regan, 2016).

Overall, our findings largely support the view that weak initial conditions, an adverse macroeconomic environment and external pressures lead to a higher reform stance. Moreover, the results also suggest that reforms happen both in times of fiscal tightening and loosening, and during periods of low interest rates.

4.3 Results for the EU and euro area countries

The muted structural reform implementation among euro area countries (see Chart 3 for details) has been identified by national policy makers and international institutions alike as the main factor holding back potential growth and the currency bloc's resilience to further shocks. Against this background, we specifically take a focus on drivers of reform implementation in euro area countries and compare them with the entire sample of OECD and EU economies.

We estimate our four benchmark specifications for the sub-sample of the euro area countries (Table 6 and Table 7 in the Annex) and compare this to the overall sample regressions in Table 1 and Table 2. Overall, results are relatively similar for the euro area country sample. However, we find that for euro area countries higher unemployment tends to be even more associated to reform implementation than for the entire sample. Moreover, our finding that low interest rates tend to favour structural reform implementation rather than hindering it comes out even stronger for the sub-sample of euro area countries throughout both reform measurement approaches. By contrast, the majority in all houses variable becomes irrelevant when focusing on euro area countries only. Also the influence of higher potential growth is not as clear any more as in the full sample, maybe as potential growth estimates don't vary so much among euro area countries only.

It is also sometimes argued that countries which are keen to enter the EU undertake a particular effort to bring their economies in shape to meet the accession criteria in the years prior to their eventual accession. Moreover, when having managed to enter the EU, reform efforts would falter in the first years after accession, not least given the larger than usual effort made in previous years. It is not only interesting to test this hypothesis from an economic perspective, but also important to control for such effect with a view to test whether overall results are not driven by such periods of reform cycles. Indeed our results confirm that reforms were more likely to be implemented before EU accession (see Table 8 in Annex), while the contrary holds for the years after accession (see Table 9 in Annex). At the same time our results from the benchmark estimations in Table 1 and 2 remain robust.

5. Robustness checks

In this section we carry out sensitivity analysis of our results by using different estimation methods. First, we test the sensitivity of the results to the linear specification followed for the estimation of large reforms episodes. Then, we perform sensitivity tests to account for possible endogeneity of the regressors.

5.1 Using a logistic specification for estimation of the probability of large reform episodes

As discussed in Section 4.1, we mainly rely on linear probability models for the analysis of large reforms given the straightforward interpretation, and second, because logit and probit models are not well-suited for fixed-effects estimation. Yet, to test whether the underlying distributional assumptions lead to different results, we cross-check our results of the LPM with a logit approach (see Table 10 in the Annex). As can be seen, results are rather robust to the choice between the two models.

5.2 Testing the endogeneity of the regressors

The estimation methods for the results presented in Section 4 treat all explanatory variables as exogenous, i.e. assuming that they are not correlated with the error term. In this subsection we test the sensitivity of our results if variables are treated as endogenous.

We start by treating the lagged institution as endogenous as the variable enters in the model as dependent variable and a regressor. In addition, we test the sensitivity of the results to the inclusion of time fixed effects.¹¹

The results of the two-stage least squares estimations presented in Table 4 overall confirm those presented in Table 2.

Table 4: Two-stage least square estimation of the drivers of reforms (change of indices)

	EPL		ETCR		DBI		FDI	
Depth of recession	-0.033**	-0.029*	-0.004	-0.001	0.012	-0.032	0.102	0.152*
	(0.015)	(0.016)	(0.005)	(0.005)	(0.036)	(0.032)	(0.088)	(0.091)
Unemployment rate	-0.015**	-0.002	-0.005*	-0.004**	0.006	0.003	0.003	-0.020*
	(0.008)	(0.004)	(0.003)	(0.002)	(0.023)	(0.013)	(0.017)	(0.011)
Potential growth	0.017**	0.010*	0.007	-0.000	-0.071***	-0.053**	0.050*	0.064**
	(0.007)	(0.006)	(0.007)	(0.005)	(0.021)	(0.024)	(0.028)	(0.027)
Chg. structural balance	0.003	-0.001	0.003	0.004	0.006	0.019	-0.077*	-0.081
	(0.008)	(0.008)	(0.003)	(0.003)	(0.033)	(0.037)	(0.042)	(0.055)
Short-term interest rate	0.005	0.008***	0.002	0.002	-0.038	0.029	0.095**	-0.033
	(0.003)	(0.002)	(0.002)	(0.001)	(0.043)	(0.021)	(0.047)	(0.032)
Programme dummy	-0.231**	-0.216**	0.012	0.018	0.397*	0.431**	-0.285	-0.354*
	(0.117)	(0.103)	(0.024)	(0.021)	(0.210)	(0.199)	(0.203)	(0.220)
Majority in all houses	-0.058*	-0.033	-0.040**	-0.012	-0.376**	-0.267**	-0.034	-0.013
	(0.031)	(0.023)	(0.019)	(0.014)	(0.182)	(0.109)	(0.168)	(0.099)
Single market dummy			-0.062**	-0.007				
			(0.030)	(0.015)				
EPL initial conditions	-0.128***	-0.026***						
	(0.033)	(0.006)						
ETCR initial conditions			-0.140***	-0.041***				
			(0.021)	(0.009)				
DBI initial conditions					-0.193***	-0.063***		
					(0.045)	(0.010)		
FDI initial conditions							-0.296***	-0.038***
							(0.050)	(0.013)
Year dummies	yes	yes	yes	yes	yes	yes	yes	yes
Country dummies	yes	no	yes	no	yes	no	yes	no
Hansen J statistic	0.143	0.611	0.100	0.192	0.125	0.027	2.519	1.2
r ²	0.158	0.125	0.284	0.252	0.216	0.26	0.319	0.2419
N	599	599	753	753	378	378	473	473

Source: authors' calculations. Note: *p<0.1; **p<0.05; ***p<0.001. Standard errors are reported in brackets. The table shows the result of 2SLS IV models with and without country-fixed effect, as in Table 2, and with time fixed effects. . The lagged initial conditions index was instrumented using its second and third lag for all reform categories but FDI where the fourth and fifth lag was also used (as suggested by tests for the validity of the instruments. For definition of all variables compare notes in Table 1.

¹¹ Also including fixed effects in our benchmark LPM does not alter the results.

The main differences appear related to the impact of the macroeconomic variables. In particular, a higher unemployment rate now has a statistically significant impact on ETCR and barriers to FDI reforms, which was not the case in the baseline equations, while the depth of recession loses significance and has the opposite sign in one case, namely for the IV FDI without fixed effects. The results support our overall conclusions on the importance of the macroeconomic environment for the implementation of reforms. Generally countries are more likely to implement reforms when they are in recessions, the unemployment rate is high or they face low growth potential.

As structural reforms are expected to affect macroeconomic outcomes we also test for possible endogeneity of those variables beyond the lagged institution by using a comparison of different Sargan-Hansen test, in essence similar to Hausman tests.¹² The tests however would suggest that the OLS estimates of our baseline regressions are consistent, as the explanatory variables can be treated as exogenous. Nonetheless, we carry out system GMM estimations as proposed by Arellano and Bover (1995) and Blundell-Bond (1998) building on Arellano-Bond (1991). Although the tests we conducted do not suggest so, we want to err on the side of caution and therefore treat the lagged institution, depth of the recession, unemployment rate, potential growth, fiscal adjustment effort and interest rate as potentially endogenous variables in the GMM estimation, given possible feedback loops with different time lags between reforms and macroeconomic outcomes. Results are presented in Annex, Table 11, and also overall confirm the results obtained by the OLS and two-stage least squares estimations. Besides confirming our main results regarding the macroeconomic environment, the results also show that the correlation between implementation of reforms and fiscal consolidation varies across policy areas, that implementation of reforms is more likely in a low interest rate environment, that adjustment programmes facilitate reform implementation and a government backed by a strong majority is also more likely to carry out reforms. While results are overall robust, in light of relevant statistical test not pointing to pertinent endogeneity issues, we tend to rely on the results obtained by OLS in the first two tables.

5.3 Other robustness checks

In addition to the robustness tests regarding estimation methods and the inclusion of time dummies, we carry out a sensitivity analysis to the definition of large reforms. In particular, we test the sensitivity of large reform based on the two standard deviations change to changes of one and a half and two and a half standard deviations. The results remained similar to those reported in Table 1.¹³

6. Conclusions

Structural reform implementation has been unsatisfactory across euro area countries since years, despite the prevailing consensus view that they would generate long-term growth benefits. In this paper, we add to the literature by looking at a very broad set of possible explanatory variables for reform implementation for a set of 40 OECD and EU countries across three decades. We summarise our main results in Table 5. Focussing on

¹² The test is defined as the difference of two Sargan-Hansen statistics: one for the equation with the smaller set of instruments, where the suspect regressors are treated as endogenous, and one for the equation with the larger set of instruments, where the suspect regressors are treated as exogenous. Under conditional homoskedasticity, this endogeneity test statistic is numerically equal to a Hausman test statistic (see Hayashi, 2000).

¹³ Results are available from the authors upon request.

reforms in the areas of product markets, labour markets, framework conditions and trade barriers, we derive the following tentative conclusions:

First, structural reforms implementation, in particular on labour markets seems to happen more often during dire economic times and when unemployment rates are high. Only countries which are expected to grow out recessions much quicker than others, given their higher expected potential growth, seem less under pressure to engage in further reforms. Second, the initial structural conditions of a country seem to impact the likelihood of reforms. The further a country is away from the frontier in economic structures, i.e. the best practices, the larger is the pressure on the government to undertake necessary reforms. Third, external pressures, such as being subject to a financial assistance programme, facilitate reform implementation, while higher financial market pressure (e.g. measured through higher sovereign bond spreads) did not seem to create significant pressure for reform implementation.

By contrast, the EU Single Market and its numerous binding directives facilitated pro-competitive reforms in various national product markets. Fourth, there is no clear correlation between fiscal-structural consolidation and implementation of reforms. Product market and trade reforms are found less likely in times of fiscal consolidation, while the opposite is true for labour market reforms. Fifth, contrary to the frequent claim, low interest rates, if at all, tend to promote rather than discourage structural reforms. This might be explained by the additional room gained for redistributive policies during periods of low interest rates, which in turn could offset potential short term cost arising from reforms for certain parts of the population. Sixth, having one party with majority in all houses increases the likelihood of reform implementation, while the proximity to national elections or the political orientation of the government does not appear to influence reform implementation. Seventh, past reforms in product markets tend to increase the likelihood of labour market reforms following suit, in line with the expectation that the former increases new firm entry, overall activity and thereby an expansion of labour demand. Also lower rents are likely to reduce resistance to labour market reforms. Lastly, focusing on euro area countries alone, results suggest that the drivers of reforms are broadly similar to those obtained for all OECD and EU countries. However the unemployment rate and lower interest rates seem even more important triggers of reform.

Table 5: Summary table – when do countries implement reforms?

	Labour market reforms	Product market reforms	Reforms on framework conditions	Reforms on FDI barriers
Depth of recession	+			+
Unemployment rate	+			
Potential growth	-	-	-	
Chg. structural balance	+		-	-
Short-term interest rate	-		-	-
Programme dummy	+		+	+
Majority in all houses	+	+	+	
Single market dummy		+		
EPL initial conditions	+			
ETCR initial conditions		+		
DBI initial conditions			+	
FDI initial conditions				+
Past product market reforms	+			

Source: authors' calculations. Note: A plus denotes that a unit increase of the variable increases the likelihood of a reform taking place, whereas a negative sign means that a unit increase reduces the probability of reforms. A plus or a minus is reported if the variable was found to exert a statistically significant impact in any of the four specifications used (see Table 1 and Table 2 for details of the specifications used). Blank cells refer to non-significant estimates.

7. References

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8. Annexes

8.1 Description of the variables

Depth of recession: This variable is zero if a country is not in a recession and is equal to the absolute GDP growth in case of a recession. Thus, the higher the number, the more severe is the recession in the respective country. Source: AMECO (European Commission) and World Economic Outlook (IMF).

Unemployment rate: Number of unemployed people in percent of total labour force. Source: AMECO (European Commission) and World Economic Outlook (IMF).

Potential Growth: Growth in potential output, at constant prices, five years ahead. For the last 5 years IMF projections (Spring 2016) have been used. Source: World Economic Outlook (IMF).

Change in the structural balance: Change in the general government annual structural balance (i.e. adjusted for the cycle and one-off operations). Source: World Economic Outlook (IMF).

Single Market Dummy: Dummy which is set to 1 if the country has access to the Single Market, 0 if not.

Financial assistance programme dummy: Dummy which is set to 1 if the country is involved in a one of the eight different funding programs from the IMF over the period 1970-2014 or more recently of the EU. The series covers 41 countries and includes all different IMF programmes.

Rating downgrade dummy: Dummy which is set to 1 if the country was downgraded by at least one of the three rating agencies in the respective year.

Short-term interest rate: National nominal short-term interest rate. Source: AMECO (European Commission) and World Economic Outlook (IMF)

Sovereign bond spreads: 10-year government bond yields vis-à-vis the 10-year German Bund for all EA and EU countries and vis-à-vis the US 10-year bond for the other countries. Source: AMECO (European Commission) and World Economic Outlook (IMF).

Old-age dependency ratio: Share of the population over 65 years old in proportion of the active population

Political variables: All are coming from the 2015 Database of Political Institutions (Inter-American Development Bank)

- **Majority in all houses:** Dummy variable set to 1, if the party of the executive have an absolute majority in the houses that have law-making powers.
- **Timing of election:** We tried various variables. First, a dummy which is 1 in the year of the election. Second, a set-wise dummy which counts down the years left for the current government in office (where 0 is the year of the election).
- **Political orientation of the government:** A variable which is 1 for right, 2 for centre and 3 for left-wing governments.

OECD ETCR: The OECD indicators of regulation in energy, transport and communications (ETCR) summarise regulatory provisions in seven sectors: telecoms, electricity, gas, post, rail, air passenger transport, and road freight.

World Bank Doing Business Indicator (DB): Data available from World Bank. The Doing Business Indicator was break-adjusted to take in account the methodological changes. This adjustment has been done using the overlapping information of the pillars calculated with the new and the old methodology and rescaling the scores of the pillars in the years before the methodological change. The overall indicator is the average of all

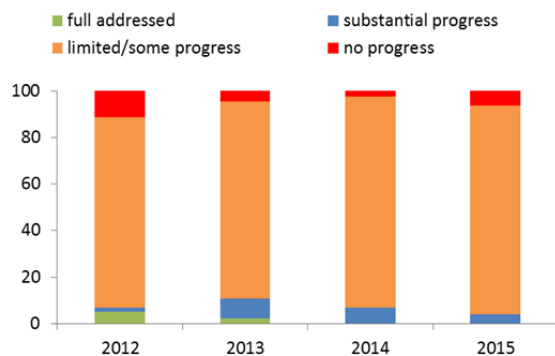
pillars (nine of them are available since 2003); “Getting Electricity” is available only from 2009. We extended the indicator backwards assuming Getting Electricity pillar constant before 2009. Quarterly figures are obtained through linear interpolation. The variable has also been standardized by the overall mean and standard deviation across the countries.

OECD Employment Protection Legislation Index (EPL): The OECD indicators of employment protection legislation measure the procedures and costs involved in dismissing individuals or groups of workers and the procedures involved in hiring workers on fixed-term or temporary work agency contracts. They are available for our sample except for 6 countries. For the need of this study we aggregated the two indexes: regular and fixed-term contracts (both versions 1).

OECD FDI restrictiveness index: The FDI Regulatory Restrictiveness Index (FDI Index) measures statutory restrictions on foreign direct investment in 58 countries, including all OECD and G20 countries, and covers 22 sectors. The FDI Index is currently available since 1997.

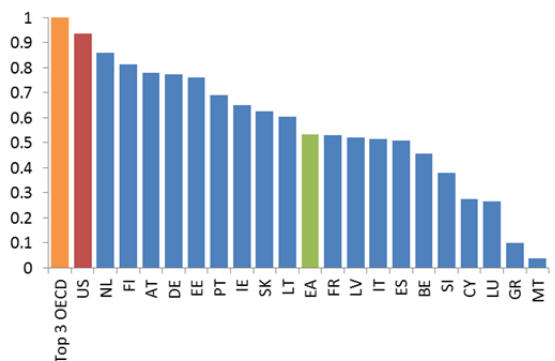
8.2 Background Tables and Charts

Chart 3: Implementation track record of EU's Country-Specific reform Recommendations (CSRs)



Source: ECB computation based on European Commission Country Reports

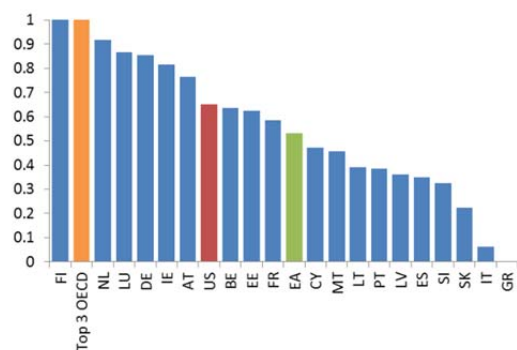
Chart 4: Composite indicator of product market efficiency



Sources: Latest OECD PMR, World Bank Doing Business indicator and ECB calculations.

Notes: Composite indicator covering the two standardised indices, averaged, and rescaled to rank between 0 and 1 (frontier). "Top 3 OECD" comprises New Zealand, the United Kingdom and Denmark.

Chart 5: Composite indicator of institutional quality



Sources: World Bank Worldwide Governance Indicators 2015 (WGI; government effectiveness, rule of law, regulatory quality, control of corruption) and ECB calculations.

Notes: Composite indicator covering the standardised indices above, averaged, and rescaled to rank between 0 and 1 (frontier). "Top 3 OECD" comprises Finland, New Zealand and Switzerland. EA stands for euro area.

Table 6: Drivers of structural reform implementation (episode definition) – subsample EA countries

	EPL		ETCR		DBI		FDI	
	FE	pOLS	FE	pOLS	FE	pOLS	FE	pOLS
Depth of recession	0.014 (0.009)	0.015* (0.009)	-0.003 (0.013)	-0.007 (0.013)	0.014* (0.008)	0.013 (0.008)	0.032*** (0.008)	0.030*** (0.008)
Unemployment rate	0.005 (0.006)	0.007** (0.003)	-0.002 (0.009)	0.008 (0.005)	0.010 (0.007)	0.009* (0.005)	0.006 (0.007)	0.001 (0.004)
Potential growth	-0.018* (0.010)	-0.011 (0.009)	-0.002 (0.014)	0.002 (0.013)	-0.014 (0.011)	-0.018* (0.009)	0.007 (0.011)	-0.000 (0.009)
Chg. structural balance	0.018** (0.008)	0.021*** (0.008)	-0.014 (0.011)	-0.014 (0.011)	-0.024** (0.012)	-0.022** (0.011)	-0.034*** (0.011)	-0.032*** (0.011)
Short-term interest rate	-0.015** (0.006)	-0.011** (0.005)	-0.013 (0.009)	-0.011 (0.007)	-0.031** (0.013)	-0.020 (0.012)	-0.010 (0.010)	-0.000 (0.009)
Programme dummy	0.277** (0.110)	0.163* (0.098)	-0.094 (0.153)	-0.129 (0.138)	0.171* (0.094)	0.219*** (0.081)	-0.097 (0.090)	-0.053 (0.079)
Majority in all houses	-0.006 (0.049)	-0.015 (0.041)	0.024 (0.069)	-0.011 (0.056)	-0.048 (0.073)	-0.015 (0.048)	-0.029 (0.059)	-0.065 (0.043)
Single market dummy			0.135* (0.072)	0.122* (0.066)				
EPL initial conditions	0.093*** (0.025)	0.015 (0.011)						
ETCR initial conditions			0.113*** (0.036)	0.032 (0.032)				
DBI initial conditions					-0.053*** (0.011)	-0.013*** (0.004)		
FDI initial conditions							2.463*** (0.850)	0.728* (0.436)
Intercept	3.359 (6.431)	6.345 (5.474)	-27.029 (18.076)	1.391 (10.233)	-13.636 (16.718)	22.255* (12.823)	1.759 (10.209)	9.716 (8.989)
r2	0.130	0.096	0.057	0.046	0.181	0.181	0.134	0.106
N	300	300	344	344	199	199	266	266

Source: authors' calculations. Note: *p<0.1; **p<0.05; ***p<0.001. Standard errors are reported in brackets.

Estimates in bold and with green background are significant for the sub-sample with EA countries, while they were not in the OECD wide sample. Conversely, estimates with orange background are not anymore significant in the EA sample while they were in the OECD-wide sample.

The table shows the result of linear probability panel models (fixed effect and pooled OLS). Dependent variable equal to 1 if a large reform is implemented and 0 otherwise. A time trend is included in all regressions and all variables are lagged by one period. The depth of recession contains a zero if GDP growth is positive and is equal to the absolute actual GDP growth rate if negative. The potential growth is 5 years ahead. The programme dummy equals one if in this year an IMF (or EU) programme existed for the country. The majority in all houses dummy is one if a one party government during the respective year had the majority in all necessary chambers of the parliament. The single market dummy is 1 for all countries part of the Single Market (i.e. 1993 or later such as for all EU accession countries). The sample covers all OECD countries, although depending on the availability of the respective indicators. The sample period spans from 1985-2013 for EPL, from 1975-2013 for ETCR, from 1997-2015 for trade barriers, and from 2003-2015 for Doing Business. The initial condition variables are the lagged underlying levels of the respective index.

Table 7: Drivers of structural reform implementation (change of indices) – subsample EA countries

	EPL		ETCR		DBI		FDI	
	FE	pOLS	FE	pOLS	FE	pOLS	FE	pOLS
Depth of recession	-0.029*** (0.011)	-0.025** (0.010)	0.005 (0.006)	0.007 (0.006)	0.004 (0.025)	-0.003 (0.026)	-0.073*** (0.023)	-0.070*** (0.023)
Unemployment rate	-0.013* (0.007)	-0.006 (0.004)	0.002 (0.004)	-0.004* (0.002)	0.054** (0.023)	0.044*** (0.015)	-0.014 (0.019)	-0.007 (0.012)
Potential growth	0.013 (0.012)	0.008 (0.010)	-0.000 (0.006)	-0.001 (0.006)	-0.074** (0.034)	-0.045 (0.029)	0.000 (0.029)	0.003 (0.026)
Chg. structural balance	-0.012 (0.010)	-0.016* (0.009)	0.007 (0.005)	0.006 (0.005)	-0.058 (0.037)	-0.042 (0.036)	0.063** (0.031)	0.064** (0.030)
Short-term interest rate	0.018** (0.007)	0.016** (0.006)	0.011*** (0.004)	0.010*** (0.003)	-0.086** (0.041)	-0.045 (0.040)	0.026 (0.029)	0.006 (0.026)
Programme dummy	-0.192 (0.132)	-0.197* (0.116)	-0.000 (0.065)	0.037 (0.057)	0.733** (0.294)	0.623** (0.263)	0.104 (0.248)	0.043 (0.220)
Majority in all houses	-0.026 (0.059)	-0.019 (0.048)	-0.001 (0.031)	0.021 (0.026)	-0.116 (0.230)	-0.247 (0.154)	-0.034 (0.162)	0.118 (0.120)
Single market dummy			-0.100*** (0.033)	-0.088*** (0.031)				
EPL initial conditions	-0.128*** (0.030)	-0.043*** (0.014)						
ETCR initial conditions			-0.128*** (0.025)	-0.065*** (0.015)				
DBI initial conditions					-0.169*** (0.036)	-0.049*** (0.012)		
FDI initial conditions							-0.119*** (0.023)	-0.058*** (0.012)
Intercept	-2.131 (7.716)	-11.175* (6.465)	17.848** (7.829)	2.008 (4.605)	-50.546 (52.400)	48.747 (41.462)	2.448 (28.030)	-23.576 (24.913)
r2	0.143	0.121	0.139	0.105	0.198	0.167	0.165	0.147
N	300	300	357	357	199	199	266	266

Source: authors' calculations. Note: *p<0.1; **p<0.05; ***p<0.001. Standard errors are reported in brackets.

Estimates in bold and with green background are significant for the sub-sample with EA countries, while they were not in the OECD wide sample. Conversely, estimates with orange background are not anymore significant in the EA sample while they were in the OECD-wide sample.

The table shows the result of fixed effect and pooled OLS models, having as dependent variable the year-on-year change in the respective policy indicator. For the EPL, ETCR and FDI a reform is a decrease in the indicator. Whereas for the DBI indicator, which is scaled conversely to the EPL, ETCR and FDI indices, an increase is interpreted as a reform. In the case of the ETCR, given its construction, very small changes of the indicator were considered no reform. For definition of the variables compare notes in Table 6.

Table 9: Reform probability five years after EU accession

	EPL			ETCR			DB			FDI																				
	episode definition		change definition	episode definition		change definition	episode definition		change definition	episode definition		change definition																		
	FE	pOLS	FE	pOLS	FE	pOLS	FE	pOLS	FE	pOLS	FE	pOLS																		
Depth of recession	0.012*	(0.007)	-0.022***	(0.008)	-0.008	(0.011)	-0.014	(0.011)	0.005	(0.005)	0.007	(0.005)	0.013*	(0.007)	0.008	(0.007)	0.036	(0.024)	0.007	(0.024)	0.046***	(0.006)	0.040***	(0.006)	-0.129***	(0.028)	-0.114***	(0.031)		
Unemployment rate	0.012***	(0.004)	-0.012**	(0.003)	-0.001	(0.007)	0.005	(0.004)	-0.003	(0.002)	-0.003	(0.002)	0.005	(0.006)	-0.004	(0.006)	-0.004	(0.020)	0.015	(0.012)	-0.006	(0.005)	0.002	(0.003)	0.020	(0.021)	-0.018	(0.014)		
Potential growth	-0.017**	(0.008)	0.017*	(0.009)	-0.001	(0.011)	0.006	(0.010)	-0.001	(0.004)	-0.008*	(0.004)	0.006	(0.011)	-0.017**	(0.008)	-0.017**	(0.035)	-0.051*	(0.026)	-0.001	(0.007)	-0.004	(0.036)	0.039	(0.032)	0.020	(0.020)		
Chg. structural balance	0.012**	(0.005)	-0.007	(0.006)	-0.002	(0.007)	-0.003	(0.007)	0.004	(0.004)	0.002	(0.004)	-0.003	(0.007)	-0.015*	(0.008)	-0.018**	(0.026)	-0.008	(0.026)	-0.012*	(0.006)	-0.013**	(0.006)	0.009	(0.023)	0.033	(0.031)		
Short-term interest rate	-0.002	(0.003)	0.004	(0.002)	-0.003	(0.004)	-0.002	(0.003)	0.002	(0.002)	0.002	(0.001)	-0.002	(0.007)	0.005	(0.005)	-0.033	(0.024)	0.011	(0.016)	-0.007	(0.007)	0.005	(0.002)	0.077***	(0.015)	-0.008	(0.012)		
Programme dummy	0.184***	(0.050)	-0.242***	(0.051)	-0.061	(0.078)	-0.058	(0.072)	0.016	(0.032)	0.021	(0.032)	-0.061	(0.078)	0.133***	(0.051)	0.369**	(0.146)	0.432***	(0.146)	0.110**	(0.051)	0.024	(0.045)	-0.020	(0.045)	-0.331	(0.196)		
Majority in all houses	0.013	(0.028)	-0.057*	(0.024)	0.101**	(0.044)	0.084**	(0.033)	-0.040**	(0.020)	-0.026*	(0.015)	0.101**	(0.044)	-0.064	(0.054)	-0.029	(0.180)	-0.131	(0.100)	-0.064	(0.054)	-0.034	(0.033)	-0.111	(0.146)	0.024	(0.117)		
Single market dummy					0.144***	(0.049)	0.077**	(0.032)	-0.130***	(0.023)	-0.042***	(0.015)	0.144***	(0.049)	-0.108*	(0.056)	-0.065	(0.186)	-0.309*	(0.152)	-0.108*	(0.056)	-0.065	(0.043)	0.637***	(0.192)	0.328**	(0.184)		
After of EU accession	-0.060	(0.038)	0.078*	(0.045)	0.005	(0.060)	0.067	(0.054)	0.021	(0.028)	-0.002	(0.026)	0.005	(0.060)	-0.108*	(0.056)	-0.065	(0.186)	-0.309*	(0.152)	-0.108*	(0.056)	-0.065	(0.043)	0.637***	(0.192)	0.328**	(0.184)		
EPL initial conditions	0.084***	(0.017)	-0.130***	(0.006)	0.113***	(0.036)	-0.006	(0.018)	-0.107***	(0.016)	-0.039***	(0.008)	0.113***	(0.036)	-0.006	(0.018)	-0.107***	(0.016)	-0.039***	(0.008)										
ETCR initial conditions																														
DBI initial conditions																														
FDI initial conditions																														
Intercept	-2.660	(3.611)	2.116	(2.720)	-7.677**	(4.199)	2.605	(4.199)	-7.677**	(4.199)	2.605	(4.199)	-7.677**	(4.199)	2.605	(4.199)	-7.677**	(4.199)	2.605	(4.199)	-7.677**	(4.199)	2.605	(4.199)	-7.677**	(4.199)	2.605	(4.199)	-7.677**	(4.199)
r2	0.101	0.068	0.126	0.095	0.034	0.031	0.123	0.075	0.034	0.031	0.123	0.075	0.034	0.031	0.123	0.075	0.034	0.031	0.123	0.075	0.034	0.031	0.123	0.075	0.034	0.031	0.123	0.075	0.034	0.031
N	634	634	634	634	723	723	753	753	723	723	753	753	723	723	753	753	723	723	753	753	455	455	455	455	586	586	586	586	586	

Source: authors' calculations. Note: * p<0.1, ** p<0.05, ***p<0.001. Standard errors are reported in brackets. The table shows the result of fixed effect and pooled OLS models, having as both using the episode definition (see Table 2) and the change definition (see Table 3). For definition of all variables compare notes in Table 1.

Table 10: Comparing linear probability model with logit model results

(marginal effects after pooled logit)

	EPL	ETCR	DBI	FDI
Depth of recession	0.0650 (0.109)	-0.142 (0.128)	0.0605 (0.0890)	0.315*** (0.0749)
Unemployment rate	0.0962* (0.0460)	0.0492 (0.0297)	0.0500 (0.0521)	0.0336 (0.0554)
Potential growth	-0.0746 (0.143)	0.0506 (0.0762)	-0.282* (0.135)	-0.0793 (0.151)
Chg. structural balance	0.265* (0.117)	-0.0220 (0.0682)	-0.269* (0.113)	-0.235* (0.103)
Short-term interest rate	-0.120 (0.0736)	-0.0313 (0.0355)	0.0365 (0.0551)	0.0380 (0.0331)
Programme dummy	1.608* (0.743)	-0.643 (0.811)	1.261* (0.528)	0.184 (0.720)
Majority in all houses	-0.285 (0.548)	0.620* (0.259)	-0.674 (0.486)	-0.401 (0.489)
Single market dummy		0.694* (0.279)		
EPL initial conditions	0.259 (0.140)			
ETCR initial conditions		-0.0484 (0.148)		
DBI initial conditions			-0.241*** (0.0489)	
FDI initial conditions				3.474 (2.576)
N	634	723	455	586

Source: authors' calculations. Note: *p<0.1; **p<0.05; ***p<0.001. Standard errors are reported in brackets.

Table 11: System GMM estimation of the drivers of reforms (change of indices)

	EPL	ETCR	DBI	FDI
Depth of recession	-0.039*** (0.010)	-0.002 (0.004)	-0.035 (0.030)	0.122 (0.096)
Unemployment rate	-0.002 (0.002)	-0.004** (0.002)	0.028* (0.015)	-0.030* (0.017)
Potential growth	0.008 (0.006)	-0.000 (0.004)	-0.043 (0.030)	0.044* (0.024)
Chg. structural balance	-0.004 (0.007)	0.004* (0.002)	0.006 (0.033)	-0.048 (0.077)
Short-term interest rate	0.008*** (0.002)	0.002* (0.001)	0.014 (0.022)	-0.016 (0.026)
Programme dummy	-0.153*** (0.052)	0.025 (0.028)	0.395* (0.208)	-0.996* (0.560)
Majority in all houses	-0.038* (0.019)	-0.020 (0.025)	-0.435*** (0.148)	0.089 (0.265)
Single market dummy		0.003 (0.019)		
EPL initial conditions	-0.026*** (0.005)			
ETCR initial conditions		-0.037*** (0.008)		
DBI initial conditions			-0.063*** (0.013)	
FDI initial conditions				-0.068** (0.033)
Year dummies	yes	yes	yes	yes
Country dummies	yes	yes	yes	yes
Arellano-Bond test for AR(1)	-3.21***	-4.32***	-3.42***	-2.44**
Arellano-Bond test for AR(2)	1.17	-2.36**	-0.44	-1.39
Hansen test	chi2(411) = 6.96	chi2(481) = 0.00	chi2(158) = 24.23	chi2(254) = 14.34
N	634	753	455	586

Source: authors' calculations. Note: *p<0.1; **p<0.05; ***p<0.001. Standard errors are reported in brackets. Instruments lagged 2 and 3 periods used. For definition of all variables compare notes in Table 1.

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