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# Structural reforms and their effects in the EU: Evidence from the Lisbon Strategy.

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**Abstract:** This paper estimates for the panel of EU27 countries, the effects of labour and product market reforms on a broad set of macroeconomic variables, including growth, (un)employment, fiscal balances, inflation and risk premia. We find evidence that our proxys for labour and goods market reform efforts have small effects on most indicators during the Lisbon Strategy sample period 2000-2010. An import policy implication is that policymakers need to be aware that structural reforms agenda's like the Europe 2020 require a careful structure and timing of their implementation.

**Keywords:** structural reforms, EU 27, employment, growth

**JEL Codes:** C23,H55,J18,J88

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## 1 Introduction

The financial and economic crisis that has plagued the global economy since 2009 has evoked unprecedented policy challenges. In the European Union –and elsewhere-, probably the biggest challenge is designing strategies to boost job creation in the context of ongoing fiscal consolidation and structural economic and social transformation. To achieve this, the necessity of structural reforms is acknowledged by many. In recent years, economists and politicians have indeed spent considerable attention to the potential effects of structural reforms in the goods and labour markets. As a result, our understanding -both at the theoretical, empirical and policy levels- of the transmissions of structural reforms to the economy has improved considerably. Structural reforms are broadly speaking all measures that change institutional frameworks, their regulation and government policy (i.e. the “regulatory framework”) and thereby contribute to improving economic performance, productivity, labour utilisation, innovation, advancing (regional) economic integration and resilience to shocks.

Structural reforms may do so by fostering more open, well-functioning, transparent and competitive markets for goods and services, more efficient and flexible labour markets that generate opportunities and foster education, better functioning and effectively regulated financial markets, sustained small and medium-sized enterprises development, enhanced opportunities for vulnerable populations, while safeguarding effective social safety net programs. Structural reforms thus potentially are important factors in promoting economic growth and alleviating poverty, in promoting the openness of the economy, in improving transparency and efficiency in resource allocation, in improving scope for private sector development and in strengthening institutions and capacity for policy analysis, is essentially the theoretical reasoning (see e.g. IMF (2004), EU Commission (2005), OECD (2006) and Joskow (2010) on this growth-structural reforms nexus).

When analysing structural reforms, complexity arises both from the essentially qualitative character of structural reforms –making it very difficult to quantify e.g. reform intensity- and from the complexity of the transmission process of structural reforms. Simple questions like how much reform activity is undertaken and what are the effects of structural reforms, are therefore very hard to answer actually.

At the conceptual level, it seems useful to distinguish between the direct transmission of structural reforms in the form of their effects on (potential) output (growth) and on (structural) unemployment from indirect effects on the broader economy, e.g. the effects of structural reforms on inflation, public finances and financial markets. By reducing inefficiencies in the goods and labour markets –market inefficiencies and market failures in other words- and regulatory inefficiencies –bureaucracy and other forms of government failures-, structural reforms aim at bringing potential output and structural unemployment closer to their equilibrium values that would be attained in the absence of any distortion to perfect competition. It is important to realize that structural reforms in addition are likely to have a whole range of indirect transmissions that may occur from their impact on fiscal deficits, interest rates, inflation or the exchange rate, e.g.

Given the qualitative nature of structural reforms and the complexity of transmissions, it seems very difficult to attach concrete numbers to structural reform efforts and the likely effects of a structural reform (or reform proposal) on output, unemployment and other variables. However, this paper finds that if one is willing to consider some simplifications, it will be possible to obtain a more quantitative analysis of structural reforms and their effects (i.e. “transmissions”). This paper namely tries to gauge the effects of structural reforms on growth, (un)employment and fiscal balances using a panel dataset of the EU 27 countries during the period 2000-2010.

Relating to structural reforms and their implementation, another research question that is often receiving interest is: under which conditions structural reforms are more likely to be implemented? Political and economic constraints limit the implementation of structural reforms. Structural reforms are typically opposed by vested interests, resulting in a *status quo bias* where structural reforms are strongly opposed by key constituencies that would be strongly affected by structural reforms in labour or goods markets. Affected groups have strong incentives to mobilise lobbying and political pressure to oppose the structural reforms. The uneven distribution of benefits and costs reduce the political support for carrying out reforms even if they would be beneficial to society as a whole. A significant political-economy literature studies the determinants of structural reforms, i.e. the reform capacity, seeking to explain cross-country differences in the scope and speed of reforms. In a notable study Hoj et al. (2006) find for a set of 21 OECD countries that the most important determinants of reforms include economic crises, exposure to foreign competition, government's duration in office, budgetary conditions and spillovers across policy areas – in particular from the product to the labour market.

Section 2 analyses the most important facts on structural reforms in the European Union. Section 3 estimates the impacts of reforms on a few macro-economic and budgetary variables. In section 4 an attempt is made to estimate the most important determinants of reforms in the EU 27. Section 5 concludes the paper by summarising the main findings.

## **2 An overview on structural reforms in the EU27, 2000-2010.**

In June 2010, the European Union's Heads of State and Government adopted the Europe 2020 Strategy. With this new economic strategy -that builds on its predecessor, the Lisbon Strategy<sup>1</sup> for growth and jobs- the EU has launched an ambitious and comprehensive policy agenda for Europe to secure macro-economic stability, healthy public finances and sustainable and inclusive economic growth.

Such a comprehensive reform agenda is expected to generate significant gains in terms of additional growth and employment as well as help ensure longer-term sustainability of public finances. An essential part of this strategy is the introduction of an ambitious structural reform agenda with reforms with a medium- to long term horizon that focus on promoting the sustainability of public finances, enhancing potential growth and realising the 2020 objectives, i.e. ensuring that the EU becomes prosperous, green and fair. A number of

<sup>1</sup> For a detailed assessment of the Lisbon Strategy, see EU Commission (2006).

concrete targets to be achieved by 2020 is well-known by now: (i) the employment target of 75 percent, (ii) the R&D and innovation/GDP target of 3 percent, (iii) targets of reducing greenhouse gas emission by 20 percent, increasing energy from renewables and energy efficiency by 20 percent, (iv) reducing school drop-out rates below 10% and (v) reducing the amount of people in or at risk of poverty and social exclusion by 20 million. The Europe 2020 Strategy seeks to incorporate lessons from past experiences and economic analysis which indicate that a well-designed, comprehensive and convincing policy agenda aimed at strengthening the supply side of the economy should be an essential part of the policy response to lead the EU out of the crisis.

In brief, Europe 2020 provides an important framework for economic and structural policies in the EU and is a comprehensive attempt to coordinate national reform processes by setting common policy targets and establishing an enhanced macro-structural surveillance. An important question in the context of the Europe 2020 Strategy is what we actually know about the effects of structural reforms on envisaged target variables such as growth, employment and fiscal balances in the EU 27 countries. As already noted in the introduction such simple questions about the size of reform efforts and the impact of reforms are actually difficult to answer. In this section we will therefore first survey the structural reforms that have been carried in the period 2000-2010 –the Lisbon Strategy period in essence-. In the next section we will use this information on structural reforms and try to estimate the effects of these reforms on a set of macroeconomic variables for the set of 27 EU countries.

*i) Labour market reforms in the the EU*

To analyse the structural reforms in the labour market we rely on the LABREF database that is maintained by the EU Commission. The LABREF database covers 8 broad policy fields which are subdivided into 36 areas of policy intervention defining as many labour market institutions and possible labour market reforms in the sense of changes in these labour market institutions. These categories are: (i) labour taxation (TAX) (employers' social security contributions, employees' social security contributions, income tax), (ii) unemployment and welfare related benefits (UNB) (net replacement rate, duration of unemployment benefits, coverage, entitlement), (iii) active labour market programmes (ALM) (public employment services, training, direct job creation and employment subsidies, other schemes), (iv) job protection (JPR) (permanent contracts, temporary contracts, hiring and firing), (v) pension systems (PEN) (early retirement, disability schemes, pensions), (vi) wage bargaining (BAR) (statutory minima, contractual flexible arrangements, government intervention in wage bargaining), (viii) working time (TIM) (participation friendly schemes, working time organisation over the life time), (viii) immigration and mobility (MOB) (border controls, selective immigration policies, measure to facilitate labour market integration of immigrants, housing, social security portability, degree recognition).

Reform count will be used as a proxy for structural reforms in the labour market. Clearly the number of reforms is a very coarse measure of reform efforts. In fact it may often lump together measures of rather limited importance and major reforms. Another problem would be that an initial reform that is later undone, is actually counted as two separate reforms. This approach is, however, inherent to the fact that the changes in the institutional and regulatory structural reforms are of a qualitative nature. Notwithstanding these limitations, this measure is providing already some more insights into structural reform designs and dynamics: their scope, speed, timing and cross-country variation can be assessed.

From the LABREF database the follow picture arises concerning the intensity of structural labour markets reforms in the euro area and EU27.

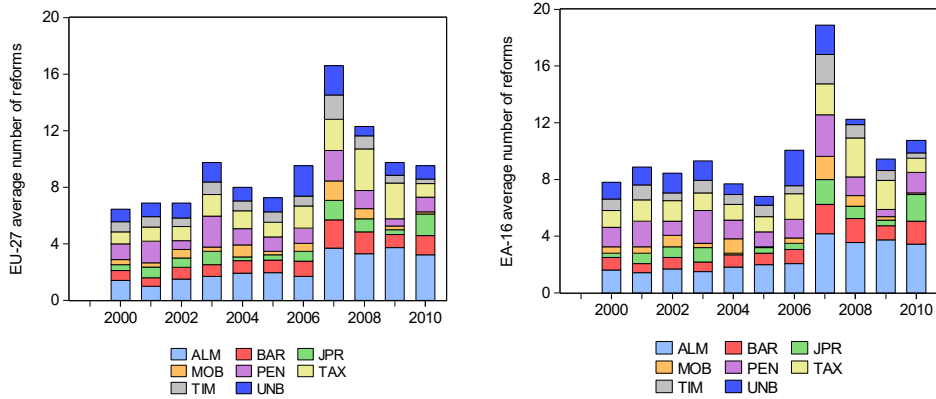


Figure 1  
 Number of labour market reforms in the European Union and Euro Area. 2000-2010.  
 Source: own calculations from the EU Commission LABREF database.

There is obviously considerable variation over time and between the different reform categories. All types of reform categories matter on average, reforms on active labour market policies and taxation appear somewhat more frequent than other categories. The average number of reforms in both euro area and EU 27 during this period is around 9.5 per year, the minimum of around 7 is reached in 2005 and the maximum of around 17 in 2007.

Also between countries there is considerable variation in the intensity of labour market reform. Figure 2 shows per country the total amount of labour market reforms during the period 2000-2010:

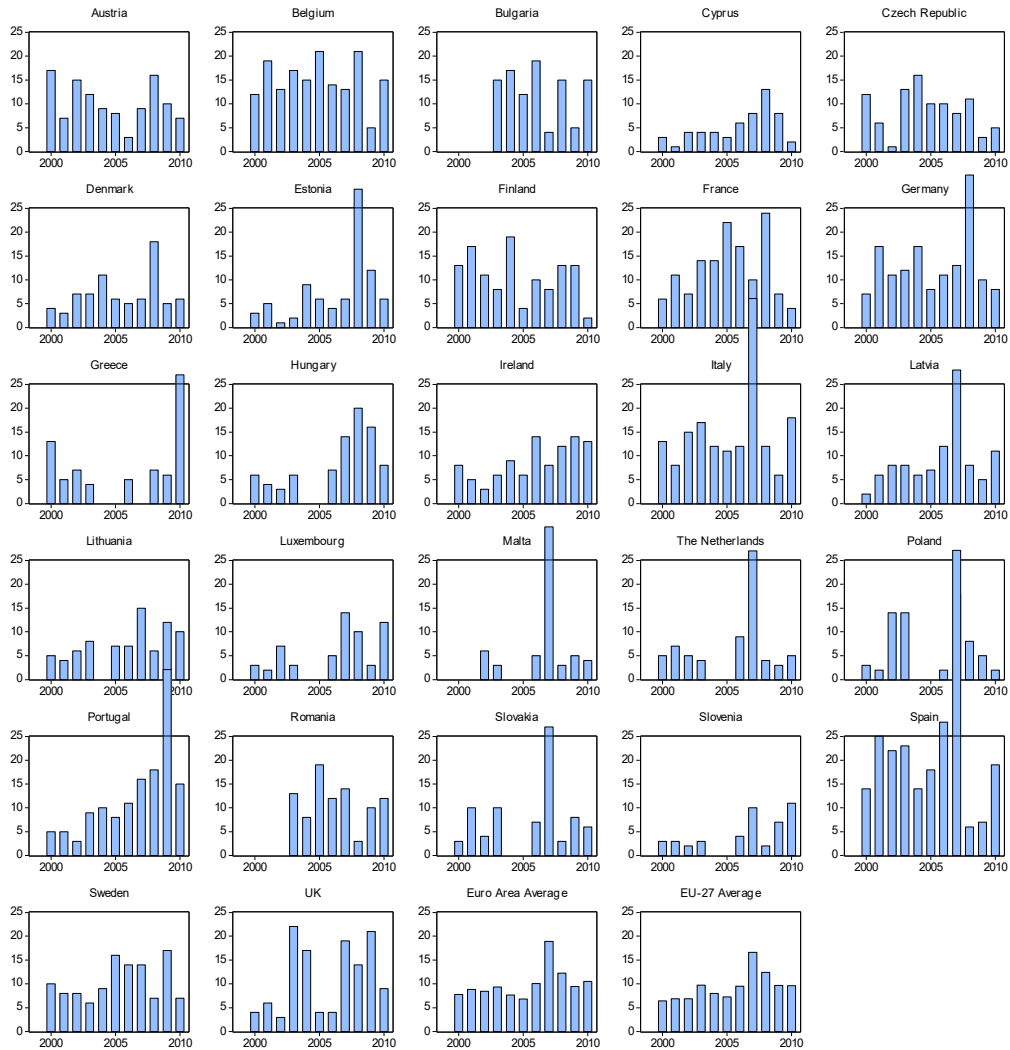


Figure 2

Number of Structural Reforms in the labour market, EU-27 countries, 2000-2010: Total sum of reforms in the eight reform sub-categories (TAX, UNB, ALM, JPR, PEN, BAR, TIM, MOB). Source: own calculations from the EU Commission LABREF database.

Slovenia displays the lowest number of labour market reforms during this period (4.1 per year on average during this period), Spain the highest (19.8 per year on average during this period).

*ii) Product market reforms in the the EU*

Broadly speaking, the aim of goods market reforms is to foster pro-competition forces in goods and services markets and to reduce economy-wide regulatory burdens in goods and services markets. Thus, by fostering efficiency of the allocation of production factors goods market reforms can have an effect on growth. Moreover, goods market reforms can thereby also have effects on other macroeconomic variables, e.g. employment, fiscal balances and inflation.<sup>2</sup>

Also in the area of product reforms it is possible to distinguish a number of categories of reforms: (i) streamlining registration and licensing procedures, (ii) facilitating start-ups, (iii) simplifying bankruptcy procedures, (iv) promoting competition for public contracts and cutting red tape, (v) strengthening competition in network industries (unbundling energy networks, improving third-party access and easing entry restrictions introducing or consolidating the power of the regulatory authority), (iv) reducing price

<sup>2</sup> Bassani and Duval (2006) e.g. find a positive effect of goods market reform and employment growth.

controls and reduce other barriers to competition in retail trade, streamlining competition laws and policies, (v) introducing incentive-based regulation, (vi) reducing the scale and scope of public ownership, (vii) reducing barriers to foreign trade (including non-tariff barriers) and foreign direct investment. Similar to the case of labour market reforms it is difficult to quantify these essentially qualitative variables into a quantitative measure that measures the structural reforms in goods markets.

Goods market reforms in our analysis will be proxied by the change in the Economic Freedom of the World (EFW) Index that is provided by the Heritage Foundation on a yearly base. It measures ten components of economic freedom, assigning a grade in each using a scale from 0 to 100, where 100 represents the maximum freedom. The ten component scores are then averaged to give an overall economic freedom score for each country. The ten components of economic freedom are: Business Freedom, Trade Freedom, Fiscal Freedom, Government Spending, Monetary Freedom, Investment Freedom, Financial Freedom, Property rights, Freedom from Corruption, Labour Freedom. In the Index of Economic Freedom, these ten components of economic freedom are weighted equally in determining country scores. For a country considering economic reforms, those components on which it scores the lowest are likely to be the most important in terms of providing significant opportunities for improving economic performance. To estimate the intensity of goods market reform in each EU country, we take the annual change in the Index of Economic Freedom (available from <http://www.heritage.org/index/download>).<sup>3</sup> A negative change would therefore amount to a reform reversal or lower amount of economic freedom.

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<sup>3</sup> A comparable indicator is the OECD's OECD Indicator of Product Market Regulation (Woelfl et al. (2009). This indicator is, however, not available for all EU-27 countries and for the years 1998, 2003 and 2008 only, for those reasons the EFW indicator was used. Also the Fraser Institute's Indicators of Economic Freedom (<http://www.freetheworld.com/>) provide a comparable set of indicators on product market regulation.

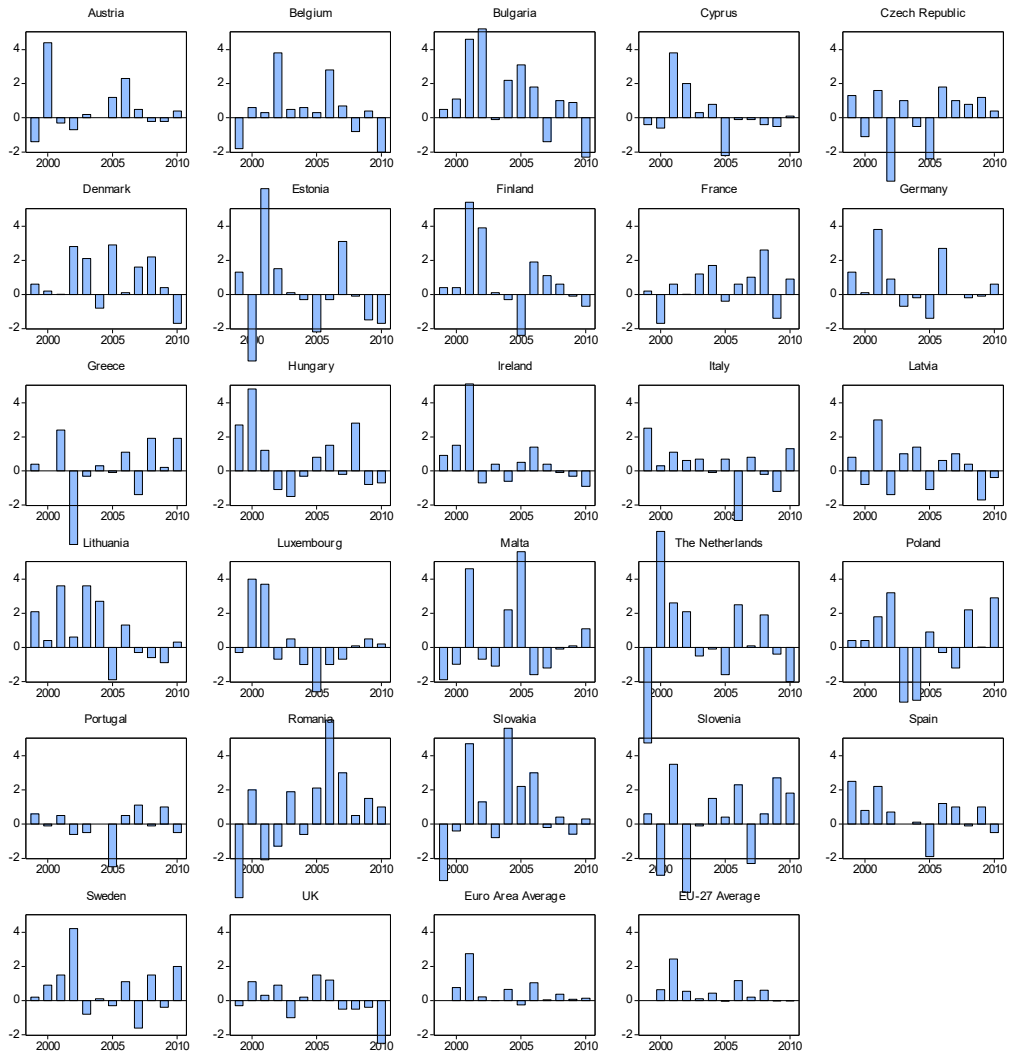


Figure 3

Goods market reforms in the EU27. Source: own calculations using the Economic Freedom of the World Index.

The average amount of goods market reform thus measured by the change in the EFW index in euro area and EU 27 during the period 2000-2010 is respectively 0.39 and 0.55 per year; least reform activity was seen in 2005 (-0.61 and -0.03, respectively), while 2001 witnesses the largest amount of goods market reform (1.95 and 2.43, respectively). As in the case of labour market reforms, considerable cross-country variation is seen: Portugal displays the lowest goods market reforms during this period (-0.05 per year on average during this period), Bulgaria the highest (1.38 per year on average during this period).

### 3 Effects of Structural Reforms in the EU: Evidence from Panel Data.

To provide more insights on the possible effects of structural reforms in the EU, panel regressions that link several macroeconomic performance measures to indicators of structural reform as well as various controls, are carried out in this section. More specifically, panel regressions are run for the panel of 27 EU countries for the period 1990-2010: essentially the period of the Lisbon Strategy. Estimated are the effects of the structural reforms measures presented in the previous section on the following variables: (1) output growth, (2) productivity growth, (3) unemployment rate, (4) long-term unemployment rate, (5) employment, (6) employment of older workers, (7) primary fiscal balance, (8) fiscal balance, (9) inflation and (10) risk premium.

## I. Estimation and Identification Strategy

We proceed our estimation in the following manner. We start by estimating the effects from structural reforms on the 10 macroeconomic variables using pooled OLS estimates of the EU-27 panel, provided in Table 1. As to be expected much variation in the macroeconomic variables can be explained by (i) the lagged dependent variable, reflecting persistence, and (ii) output growth -as a proxy for the business cycle- which is clearly as a driving adjustment in labour markets, public finance, inflation and the risk premium. Europe's financial and budgetary crisis is clearly reflected in the highly significant effects from the year dummies for 2009 and 2010.

It is seen that (with exception of the risk premium), labour market and goods market reform will have the same directional effect. These structural reforms indicators have positive effects on growth, productivity, fiscal balance and inflation and a negative effect on unemployment. It is seen that the goods and labour market reform indicators, however, have in all cases only small effects. This could lead to the conclusion at first sight that reforms hardly have an effect. However, when taking into account that 9.5 labour reforms per year take place in EU countries on average and that the goods market reform indicator increased by 0.55 per year on average in the EU (during the sample period), the effects do become more meaningful. It would imply that the average labour market reform effort (during the sample period at least) contributes almost 0.3 percent to growth and the average goods market reform almost 0.1 percent. In similar vein, labour market reforms and goods market reforms contribute to a reduction in the unemployment rate with 0.15 and 0.01 percent, respectively, an increase in the employment rate by 0.16 and 0.03 percent, and an increase in the fiscal balance by 0.2 and 0.01 percent.

While the pooled estimations of Table 1 enable to draw a broad picture on the effects of structural reforms on the broader economy, they suffer from one drawback: idiosyncratic heterogeneity remains unaccounted for. To account also for idiosyncratic cross-country heterogeneity in the estimations, we re-estimate in Table 2 the panel, including fixed or random country effects. The fixed or random effects will pick up the cross-country variation that is not explained by the cross-country variation in endogenous variables and could in this way contribute to improve the explanatory power of the panel regressions. The inclusion of fixed or random effects is based on the Hausman correlated random effects test. Comparing Table 2 with Table 1 we see that the results of the fixed/random effects estimation confirm our results and conclusions obtained with the pooled OLS estimation in Table 1.

In a final step, we replace the overall labour market reforms indicator by the eight underlying types of labour market reforms attempting to find evidence whether or not one or more categories of labour market reforms are more important than other categories. In Table 3 the fixed/random effects estimation results for this case with the overall labour reforms indicator decomposed in the 8 underlying reform categories, is presented. A wide variety of effects is seen which can not be described all in detail. Effects are again typically of small size and struggle to reach statistical significance. An important reason is of course that in many panel observations the number of say reforms in unemployment benefits in country x in year y is zero or small. The effects of the goods market reforms and the other explanatory variables are again similar to the picture that resulted from Table 1 and 2.



Table 1

Effects of structural reforms on macroeconomic variables, pooled OLS estimation, panel of EU-27 countries, 2000-2010.

Dependent variable	(1) Output growth <sup>a</sup>	(2) Productivity growth <sup>b</sup>	(3) Unemployment rate <sup>c</sup>	(4) Long term unemployment rate <sup>d</sup>	(5) Employment <sup>e</sup>	(6) Employment older workers <sup>f</sup>	(7) Primary fiscal balance <sup>g</sup>	(8) Fiscal balance <sup>h</sup>	(9) Inflation <sup>i</sup>	(10) Risk premium <sup>j</sup>
Constant	1.73*** (0.51)	0.39 (0.26)	1.07*** (0.21)	2.60** (1.02)	-0.55 (0.63)	0.73* (0.44)	-0.62** (0.29)	-0.93*** (0.32)	1.63** (0.65)	2.21*** (0.58)
Lagged dep. variable	0.72*** (0.04)	0.02 (0.05)	0.99*** (0.02)	0.96*** (0.02)	0.99*** (0.01)	0.98*** (0.01)	0.87*** (0.04)	0.88*** (0.04)	0.24*** (0.06)	0.21*** (0.06)
Output growth		0.63*** (0.04)	-0.28*** (0.03)	-0.13 (0.11)	0.22*** (0.02)	0.17*** (0.04)	0.13*** (0.04)	0.16*** (0.05)	0.34*** (0.09)	-0.13 (0.09)
Labour Market Reforms	0.03** (0.02)	0.01 (0.01)	-0.02** (0.01)	-0.08** (0.04)	0.02** (0.01)	0.01 (0.84)	0.02 (0.02)	0.02 (0.02)	0.01 (0.03)	-0.05* (0.03)
Goods Market Reforms	0.01 (0.09)	0.01 (0.05)	-0.01 (0.04)	-0.21 (0.15)	0.05* (0.03)	0.12** (0.05)	-0.01 (0.06)	0.01 (0.07)	0.16 (0.14)	0.14 (0.13)
Euro Area	0.03 (0.29)	-0.99*** (0.06)	-0.26* (0.14)	-0.31 (0.57)	0.45*** (0.12)	0.41** (0.20)	-0.16 (0.26)	-0.23 (0.25)	-0.59 (0.52)	-1.19** (0.49)
D2009	-6.88*** (0.52)	0.57 (0.46)	0.31 (0.31)	-5.40*** (1.34)	-0.29 (0.28)	0.55 (0.46)	-3.27*** (0.58)	-2.93*** (0.58)	-1.76 (1.16)	2.33*** (0.83)
D2010	5.47*** (0.62)	2.23*** (0.41)	0.96*** (0.23)	8.12*** (0.98)	-0.84*** (0.20)	-0.89*** (0.34)	0.01 (0.47)	0.04 (0.46)	1.01 (0.87)	2.61** (1.13)
Adjusted R2	0.54	0.72	0.92	0.89	0.98	0.98	0.73	0.74	0.22	0.11
S.E. regr	2.60	1.58	1.09	4.65	0.98	1.62	2.01	2.02	3.99	3.95
Log likelihood	-695.00	-500.33	-436.82	-864.74	-407.33	-555.29	-615.83	-625.02	-752.66	-822.74
Durbin Watson	1.98	1.31	1.25	1.48	1.41	1.60	1.70	1.66	2.00	1.98
Mean dep var	2.63	1.66	8.17	39.93	64.04	42.62	-0.08	-2.51	3.03	1.15
No. Obs.	294	269	293	294	294	294	293	296	270	296

Notes: \*\*\*: significant at a 1% level. \*\*: significant at a 5% level. \*: significant at the 10% level.

<sup>a</sup> Gross domestic product at market prices, volume, annual percentage change. Source Eurostat. <sup>b</sup> Labour productivity per hour worked - GDP in PPS per hour worked. Source Eurostat.

<sup>c</sup> Total unemployment rate, % of civilian working age population, annual average. Source Eurostat. <sup>d</sup> Long-term unemployment in % of total unemployment. Source Eurostat.

<sup>e</sup> Employment rate (15 to 64 years). Source: Eurostat. <sup>f</sup> Employment rate (55 to 64 years). Source Eurostat.

<sup>g</sup> General government, Net borrowing excluding interest. Percentage of GDP. Source: Eurostat. <sup>h</sup> General government, Net borrowing. Percentage of GDP. Source: Eurostat

<sup>i</sup> GDP deflator, Annual percentage change. Source: Eurostat. <sup>j</sup> Government bond yields 10 years' maturity, annual average, differential vis-à-vis Germany. Source: Eurostat.

Table 2

Effects of structural reforms on macroeconomic variables, panel of EU-27 countries, fixed/random effects OLS, 2000-2010.

Dependent Variable	(1) Output growth <sup>a</sup>	(2) Productivity growth <sup>b</sup>	(3) Unemployment rate <sup>c</sup>	(4) Long term unemployment rate <sup>d</sup>	(5) Employment <sup>e</sup>	(6) Employment older workers <sup>f</sup>	(7) Primary fiscal balance <sup>g</sup>	(8) Fiscal balance <sup>h</sup>	(9) Inflation <sup>i</sup>	(10) Risk premium <sup>j</sup>
Constant	1.56*** (0.48)	0.75* (0.33)	1.63*** (0.34)	15.14*** (2.24)	1.48 (1.95)	0.86 (0.53)	-0.77* (0.42)	-1.53*** (0.47)	1.88** (0.90)	2.24*** (0.80)
Lagged dep. Variable	0.36*** (0.06)	-0.14*** (0.05)	0.95*** (0.03)	0.66*** (0.05)	0.97*** (0.03)	0.98*** (0.01)	0.70*** (0.04)	0.72*** (0.06)	0.11* (0.06)	0.08 (0.06)
Output Growth		0.63*** (0.04)	-0.33*** (0.03)	0.10 (0.12)	0.25*** (0.02)	0.18*** (0.04)	0.21*** (0.05)	0.24*** (0.05)	0.24** (0.09)	-0.28*** (0.09)
Labour Market Reforms	0.03* (0.02)	0.02* (0.01)	-0.02** (0.01)	-0.09** (0.04)	0.02** (0.01)	0.01 (0.01)	0.03* (0.02)	0.03* (0.02)	0.01 (0.04)	-0.05* (0.03)
Goods Market Reforms	0.03 (0.08)	0.04 (0.05)	-0.003 (0.04)	-0.14 (0.15)	0.05* (0.03)	0.11** (0.05)	0.02 (0.07)	0.03 (0.07)	0.16 (0.14)	0.14 (0.13)
Euro Area	-0.05 (0.84)	-0.62 (0.54)	-0.16 (0.36)	-2.60* (1.55)	0.18 (0.33)	0.38 (0.25)	-0.24 (0.73)	-0.28 (0.70)	-0.72 (1.48)	0.49 (1.33)
D2009	-8.36*** (0.53)	0.11 (0.46)	-0.20 (0.32)	-4.71*** (1.38)	0.12 (0.33)	0.64 (0.46)	-2.64*** (0.60)	-2.28*** (0.60)	-2.79** (1.15)	4.31*** (1.19)
D2010	1.45* (0.78)	1.29*** (0.42)	0.91*** (0.23)	5.75*** (1.06)	-0.72*** (0.21)	-0.86** (0.33)	-0.73 (0.53)	-0.60 (0.52)	-0.03 (0.94)	1.55* (0.84)
Adjusted R2	0.60	0.76	0.93	0.90	0.98	0.97	0.74	0.76	0.22	0.14
S.E. regr	2.41	1.47	1.03	4.48	0.98	1.57	1.95	1.98	4.00	3.88
Log likelihood	-658.78	-467.01	-407.55	-839.84	-384.91		-594.16	-603.52	-739.26	-803.19
Durbin Watson	1.98	1.41	1.56	1.32	1.64	1.72	1.70	1.67	1.97	2.00
Mean dep var	2.63	1.66	8.17	39.93	64.04	42.62	-0.08	-2.51	3.03	1.15
Hausman test	Fixed	Fixed	Fixed	Fixed	Fixed	Random	Fixed	Fixed	Fixed	Fixed
No. Obs.	294	269	293	294	294	294	293	296	270	296

Notes: \*\*\*: significant at a 1% level. \*\*: significant at a 5% level. \*: significant at the 10% level.

<sup>a</sup> Gross domestic product at market prices, volume, annual percentage change. Source Eurostat. <sup>b</sup> Labour productivity per hour worked - GDP in PPS per hour worked. Source Eurostat.

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<sup>g</sup> General government, Net borrowing excluding interest. Percentage of GDP. Source: Eurostat. <sup>h</sup> General government, Net borrowing. Percentage of GDP. Source: Eurostat

<sup>i</sup> GDP deflator, Annual percentage change. Source: Eurostat. <sup>j</sup> Government bond yields 10 years' maturity, annual average, differential vis-à-vis Germany. Source: Eurostat.

Table 3

Effects of structural reforms on macroeconomic variables, panel of EU-27 countries, fixed/random effects OLS, 2000-2010.

Dependent variable	(1) Output growth <sup>a</sup>	(2) Productivity growth <sup>b</sup>	(3) Unemployment rate <sup>c</sup>	(4) Long term unemployment rate <sup>d</sup>	(5) Employment <sup>e</sup>	(6) Employment older workers <sup>f</sup>	(7) Primary fiscal balance <sup>g</sup>	(8) Fiscal balance <sup>h</sup>	(9) Inflation <sup>i</sup>	(10) Risk premium <sup>j</sup>
Constant	1.51*** (0.48)	0.76** (0.33)	1.07*** (0.21)	15.29*** (2.28)	1.65 (2.00)	0.85 (0.60)	-0.81* (0.42)	-1.00*** (0.33)	1.99** (0.88)	2.28*** (0.80)
Lagged variable dep.	0.35*** (0.06)	-0.15*** (0.05)	0.99*** (0.02)	0.66*** (0.05)	0.96*** (0.03)	0.98*** (0.01)	0.69*** (0.06)	0.88*** (0.04)	0.09 (0.06)	0.08 (0.06)
Output growth		0.63*** (0.04)	-0.29*** (0.02)	0.12 (0.12)	0.25*** (0.02)	0.19*** (0.04)	0.22*** (0.05)	0.17*** (0.05)	0.20** (0.10)	-0.30*** (0.10)
Active LM policy (ALM)	-0.02 (0.08)	0.08* (0.05)	-0.01 (0.03)	0.07 (0.14)	-0.02 (0.03)	-0.04 (0.05)	-0.08 (0.06)	-0.05 (0.06)	-0.07 (0.13)	-0.07 (0.12)
Bargaining (BAR)	0.11 (0.14)	0.06 (0.09)	-0.02 (0.06)	-0.37 (0.27)	-0.01 (0.06)	0.01 (0.09)	-0.03 (0.12)	-0.05 (0.11)	0.75*** (0.24)	0.15 (0.23)
Job Protection (JPR)	-0.27** (0.12)	-0.01 (0.07)	-0.02 (0.05)	-0.11 (0.22)	0.03 (0.05)	0.02 (0.08)	0.21** (0.10)	0.18* (0.09)	-0.13 (0.20)	0.01 (0.19)
Mobility (MOB)	0.05 (0.20)	-0.27** (0.12)	-0.09 (0.08)	-0.49 (0.36)	0.11 (0.08)	-0.02 (0.13)	0.12 (0.16)	0.14 (0.15)	0.36 (0.33)	0.37 (0.31)
Pension (PEN)	-0.10 (0.10)	-0.04 (0.06)	-0.04 (0.04)	-0.02 (0.18)	0.04 (0.04)	0.04 (0.06)	-0.02 (0.08)	-0.02 (0.07)	-0.20 (0.16)	-0.07 (0.15)
Taxation (TAX)	0.16* (0.09)	0.10* (0.06)	0.01 (0.04)	-0.14 (0.17)	0.02 (0.04)	0.04 (0.06)	0.11 (0.07)	0.03 (0.07)	-0.09 (0.16)	-0.26* (0.15)
Time (TIM)	0.28* (0.16)	-0.03 (0.10)	-0.06 (0.07)	0.16 (0.31)	0.03 (0.06)	-0.02 (0.11)	-0.01 (0.14)	0.06 (0.13)	-0.35 (0.28)	-0.20 (0.27)
Unemployment Benefit (UNB)	0.02 (0.10)	0.07 (0.06)	0.02 (0.04)	-0.22 (0.20)	0.03 (0.04)	0.08 (0.07)	0.06 (0.08)	0.06 (0.08)	0.18 (0.18)	0.01 (0.17)
Goods Market Reforms	0.02 (0.08)	-0.03 (0.05)	-0.01 (0.04)	-0.13 (0.15)	0.05* (0.03)	0.10* (0.05)	0.02 (0.08)	0.01 (0.07)	0.17 (0.14)	0.14 (0.13)
Euro Area	-0.05 (0.85)	-0.47 (0.55)	-0.25* (0.14)	-2.27 (1.58)	0.17 (0.33)	0.37 (0.28)	-0.18 (0.74)	-0.18 (0.27)	-0.34 (1.47)	0.34 (1.35)
D2009	-8.24***	-0.11***	0.18	-4.95***	0.24	0.77	-2.41***	-2.66***	-2.94**	3.99***

	(0.57)	(0.48)	(0.31)	(1.44)	(0.31)	(0.48)	(0.62)	(0.59)	(1.28)	(1.24)
D2010	1.69**	0.90**	0.91***	5.50***	-0.62***	-0.78**	-0.72	0.08	-0.24	1.48*
	(0.81)	(0.45)	(0.23)	(1.14)	(0.22)	(0.36)	(0.55)	(0.47)	(0.99)	(0.91)
Adjusted R2	0.61	0.76	0.91	0.90	0.98	0.96	0.74	0.73	0.24	0.14
S.E. regression	2.40	1.46	1.09	4.51	0.96	1.56	1.95	2.01	3.94	3.89
Log likelihood	-653.17	-461.08	-418.31	-837.67	-383.21		-589.99	-	-731.21	-800.14
Durbin Watson	1.94	1.48	1.28	1.36	1.66	1.77	1.74	1.71	1.99	1.99
Mean dep. var.	2.63	1.66	8.17	39.93	64.04	42.62	-0.08	-2.51	3.03	1.15
Hausman test	Fixed	Fixed	Random	Fixed	Fixed	Random	Fixed	Random	Fixed	Fixed
No. Obs.	294	269	293	294	294	294	293	296	270	296

Notes: \*\*\*: significant at a 1% level. \*\*: significant at a 5% level. \*: significant at the 10% level.

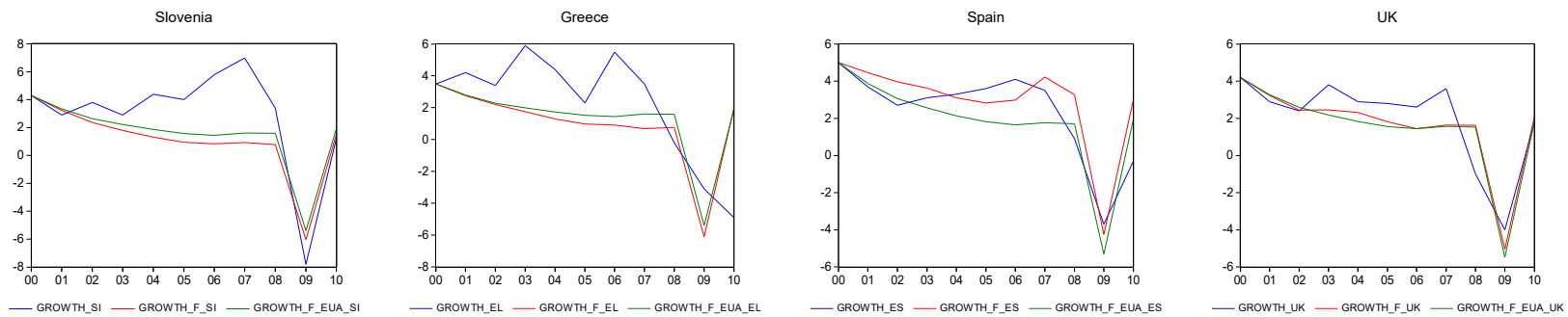
<sup>a</sup> Gross domestic product at market prices, volume, annual percentage change. Source Eurostat. <sup>b</sup> Labour productivity per hour worked - GDP in PPS per hour worked. Source Eurostat.

<sup>c</sup> Total unemployment rate, % of civilian working age population, annual average. Source Eurostat. <sup>d</sup> Long-term unemployment in % of total unemployment. Source Eurostat.

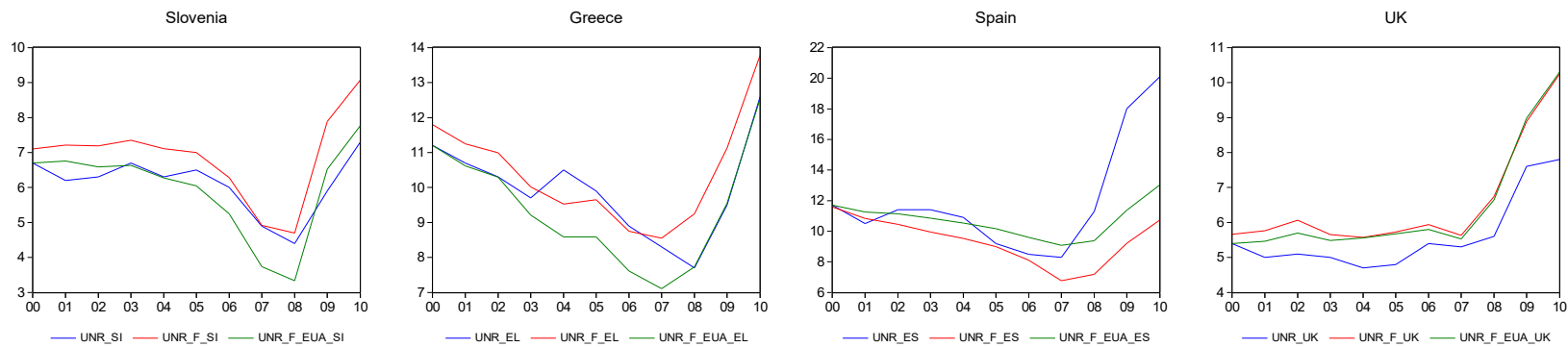
<sup>e</sup> Employment rate (15 to 64 years). Source: Eurostat. <sup>f</sup> Employment rate (55 to 64 years). Source Eurostat.

<sup>g</sup> General government, Net borrowing excluding interest. Percentage of GDP. Source: Eurostat. <sup>h</sup> General government, Net borrowing. Percentage of GDP. Source: Eurostat.

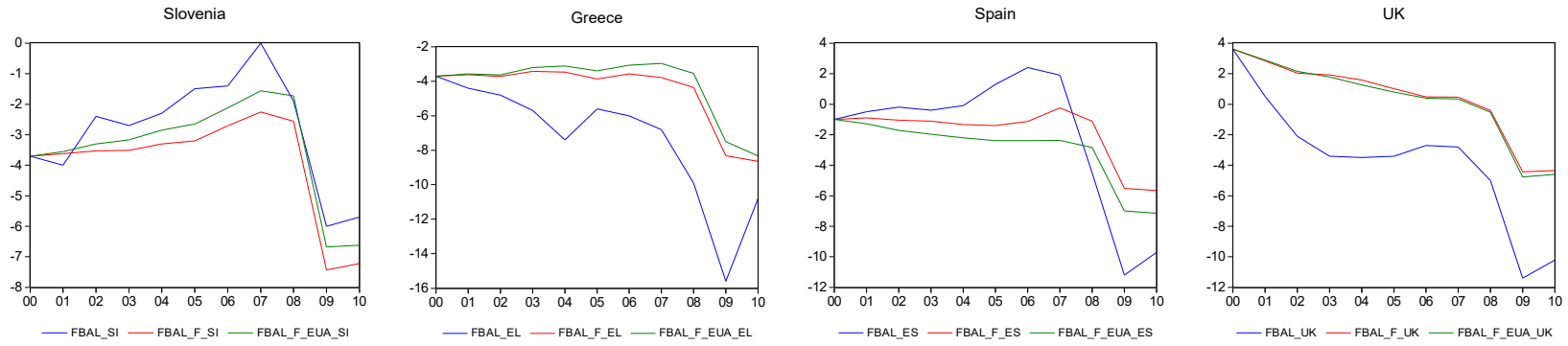
<sup>i</sup> GDP deflator, Annual percentage change. Source: Eurostat. <sup>j</sup> Government bond yields 10 years' maturity, annual average, differential vis-à-vis Germany. Source: Eurostat.



(α) Real GDP growth



(β) Unemployment rate



(χ) Fiscal balance (% GDP)

Figure 1

Comparison of predicted effects of actual reform strategy (red lines) with effects of a reform strategy that follows the EU27 average (green lines) and actual growth, unemployment rate and fiscal balance (blue lines).

The main insight from the estimation results appears to be that structural reforms –at least as to the extent proxied by our indicators- have mainly small effects on the macroeconomic indicators: the “reform multipliers” of each reform are likely to be small. The impact of different structural policies on various variables can be gauged using simulated “reform multipliers”. The multipliers report measure the effects of unit changes in different structural reforms items. The multipliers can be simulated over a ten-year period and at steady state to shed light on the time horizon required for different reforms to come to fruition. Given that typically various number and types of reforms are taking place at each datapoint, the overall impact of reform processes is certainly non-negligible.

From the estimation results alone however it is difficult to gauge how the various reform strategies that EU27 countries implemented in our sample period of the Lisbon Strategy really affected their economy. It seems interesting to conduct a thought experiment to obtain a more concrete idea about the reforms and their impact. In particular, we could ask ourselves the following question: what if country x would not have implemented its reform package as indicated by the reform measures we calculated but instead would have implemented the reform path of the EU27 on average, so speeding up the reform pace for countries with low reform effort and reducing the reform pace of fast reformers (and keeping the same reform intensity for countries basically for countries close to the average).

Figure 1 displays the effects of changing the reform path to the EU27 average in case of two slow reformers, Slovenia and Greece, and a country with fast reforms, Spain and a country close to the EU27 average, the UK. It is seen that that the Slovenian and Greek economy would have benefited in terms of higher growth, higher fiscal balances and in particular lower unemployment, if the reform efforts had been matching the European average over the same period. In a similar vein, the Spanish economy would have grown less, fiscal balances would have been lower and unemployment rate higher with a reform intensity at the European average. In the case of the UK that had a reform path that has been close to the European average, the effects are of course small compared to the other three countries.

### **Evaluation of the Lisbon Strategy**

It is also interesting to interpret our results in the context of an overall evaluation of the Lisbon Strategy. In the original formulation by the EU Commission the Lisbon Strategy’s aim was to make the EU “the most competitive and dynamic knowledge-based economy in the world capable of sustainable economic growth with more and better jobs and greater social cohesion”, by 2010. To do so a number of headline targets of the Lisbon Strategy were formulated with a 2010 deadline: 70% total employment and a 3% GDP spend on R&D. The principal objective of the Lisbon strategy was to improve the pace and quality of reforms at national and European level: if Member States’ reforms had the desired effect, average GDP growth across the EU should be around 3%. It has been acknowledged that the Lisbon Strategy has not delivered when looking at the key numbers only, even if one excludes the years 2009 and 2010 when Europe was hit by the severe effects from the financial and economic crisis.

## 4 Conclusions

This paper estimates for the panel of EU27 countries, the effects of labour and goods market reforms on a broad set of macroeconomic variables, including growth, (un)employment, fiscal balances, inflation and risk premia. We find evidence that labour and goods market reforms have small but significant effects on most indicators. An import policy implication is that policymakers need to be aware that structural reforms agenda's like the Europe 2020 require a careful structure and timing of their implementation.

But implementing growth-oriented labour market and goods market reforms may not be easy. This paper identifies the potential effects of reform strategies and allows policy makers to gauge the effects of reform strategies on different policy objectives. It stresses that with clear vision, strong leadership and solid policy analysis, output and employment growth-oriented reform can be realised.

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