APPENDIX D: EX-POST SIMULATION OF MFP GAINS FROM 2008-2013 REGULATORY CHANGES, AND ASSESSMENT OF THE LONG TERM AND DYNAMIC ADJUSTMENT CALIBRATION RELATIONSHIPS

EX-POST SIMULATION OF MFP GAINS FROM 2008-2013 REGULATORY CHANGES

THE OECD Harmonized Tariffs HT indicators are not available after 2008, so our simulation is only based on the evidence provided by the OECD Non-Manufacturing Regulation NMR indicators and the OECD Employment protection Legislation EPL indicators for the different countries in our sample (with the exception of the USA for which the information is also lacking in 2008). The Bar chart in Figure D1 documents what have been the changes in these indicators over the period 2008-2013. It shows that Italy, then France and Austria are the three countries that have implemented the most significant non-manufacturing pro-competitive regulatory reforms, while such reforms have been very modest in the other countries. Italy in particular has adopted several reforms in transport and communication industries and in professional services.in the period. It also appears that the *EPL* type regulatory reforms have been very limited in countries.

The Bar chart in Figure D2 shows the long-term *MFP* gains that can be expected from these regulatory changes. It is similar to Figure 2 in the text for the expected long term MFP gains under the extreme hypothesis of an immediate implementation in all countries of the 2013 lightest regulatory practices. The evaluation method is the same in the two cases as explained in section 4 of the text. We have simply aggregated the country*industry estimated MPP gains at the country level by weighting them by the value added industry shares in national GDP. The differences in long term MFP gains across countries are thus directly related to the differences in the changes in NMR and EPL regulatory reforms. The estimated MFP gains are highest for Italy, then France and Austria. It is important to keep in mind, however, that these are long term expected gains, and that on the basis of our rough assessment of adjustment speed we can consider that only about 20% to 30% of these gains have possibly been achieved as of 2014.

ASSESSMENT OF THE LONG TERM CALIBRATION RELATIONSHIPS

The long term calibration relationships that allow us to perform the simulation of the (*MFP*) gains resulting from structural reforms of product and labour markets, as quantified by the OECD NMR, HT and EPL indicators are documented in Table D1. They are estimated as four distinct OLS projections of respectively: in column (1) the country*industry changes on production prices in non-manufacturing industries on the NMR indicators; in column (2) the country*industry changes on production prices in manufacturing industries on the HT indicators; in column (3) the country changes in low-skilled wages on the *EPL* indicators for low-skilled workers; and in column (4) the country changes in high-skilled wages on the *EPL* indicators for high-skilled workers. The two calibration relations thus include country*industry and country*year fixed effects for production prices and separate country and year fixed effects for wages. We see that the estimated coefficients are all positive as expected and that they are very precisely at a one 1% confidence interval for the first three relations, and weakly so at a 10% confidence interval for fourth one (i.e. for high-skilled workers).

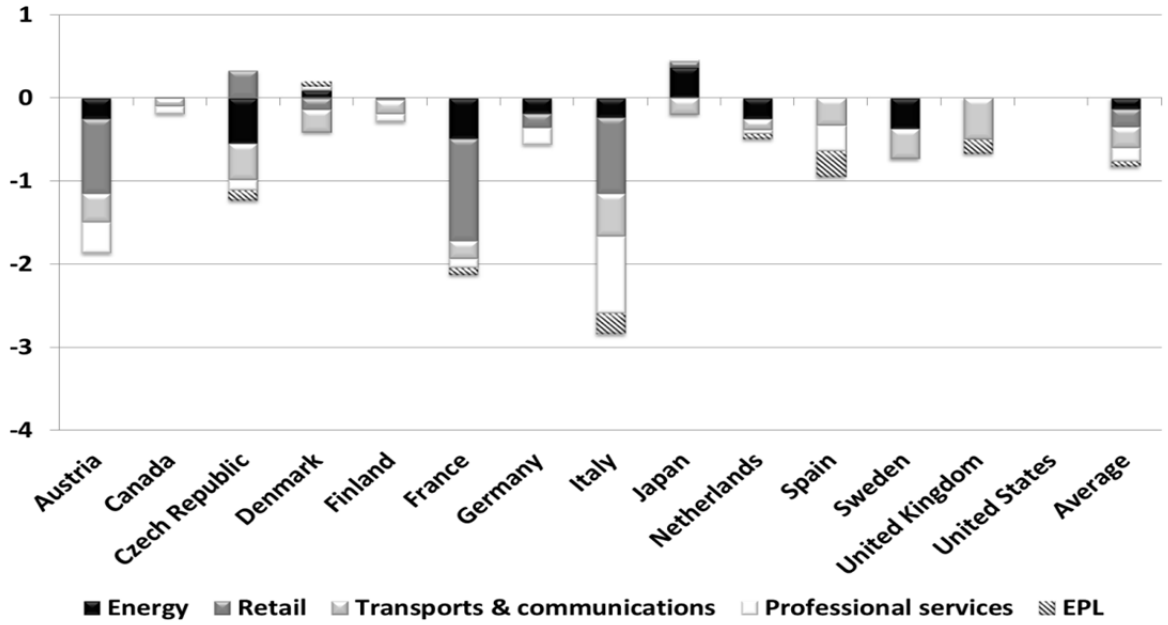
ASSESSMENT OF THE DYNAMIC ADJUSTMENT CALIBRATION RELATIONSHIPS

The DOLS estimator provides the long-term coefficients of the estimated relationships. To illustrate the dynamic of the impact of the reforms, we evaluate the speed of adjustment: (i) from OECD indicators to production price and wage changes; then (ii) from these changes to MFP evolutions. Then, we compute the dynamic from OECD indicator changes to MFP evolutions.

We use the same method to estimate each speed of adjustment. To estimate the speed of adjustment from production price and wage changes to MFP evolutions, for instance, we first compute the difference between the observed MFP and the MFP long-term prediction according to relation (1) estimates (Table 1 column 6). Then, we estimate the impact of this variable on MFP growth. We expect that an MFP observed value lower than its prediction, because of a recent pro-competitive product market reform for instance, would lead to an MFP increase in order to catch-up with the long-term prediction. Our estimates support this relation, there is a force toward the long-term prediction: a smaller value than the long-term

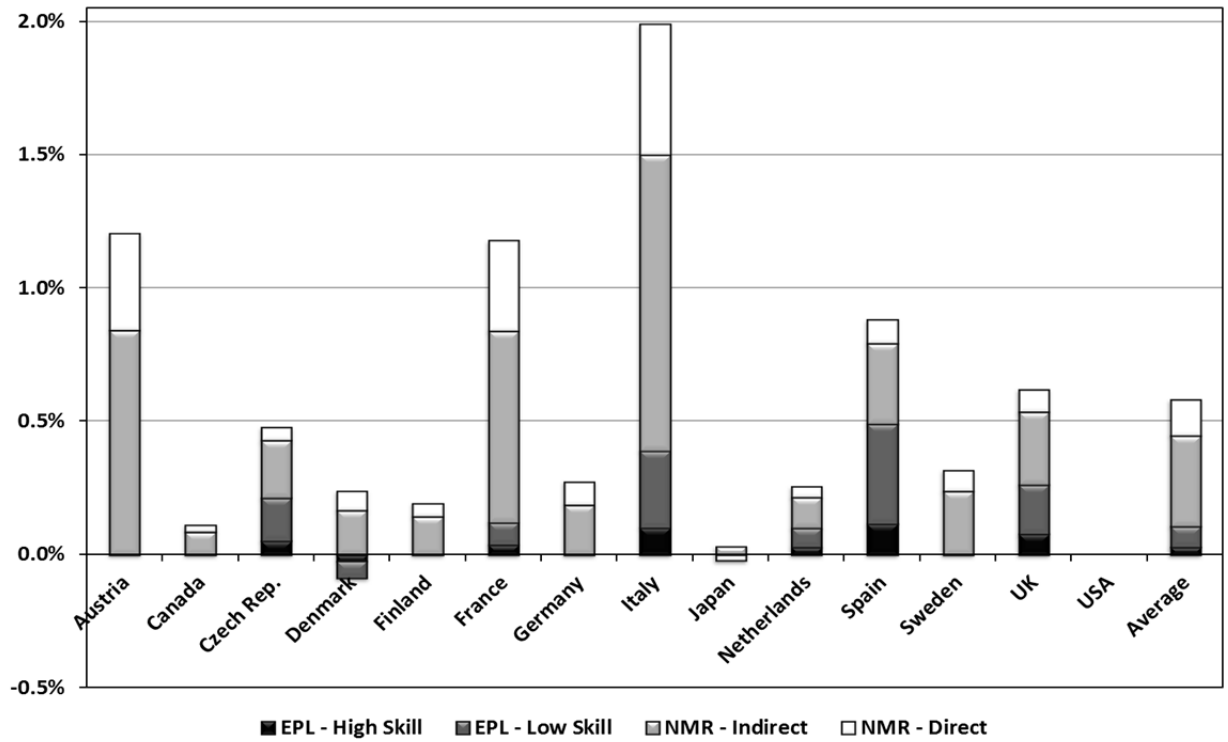
prediction has a positive and significant impact on growth for *MFP*, manufacturing and non-manufacturing relative production prices as well as on high skilled and low skilled real wages.

Figure D1: OECD EPL and NMR indicators changes over 2008-2013 period



Scale of the indicators in levels: 0-6, 0 for the most pro-competitive level.

Figure D2: Simulated long-term MFP gains from NMR and EPL regulatory changes over 2008-2013.



EPL – High-Skilled **and** ***EPL – Low-Skilled***: Long-run impacts through high and low-skilled wages, respectively.

NMR – Indirect **and** ***NMR – Direct*:**: Long-run indirect and direct impacts through production prices in non-manufacturing industries, respectively.

Table D1: Long term calibration relationships

Dep. variable	Relative production prices		Real wages	
	(1)	(2)	(3)	(4)
	Non-manuf. Industries	Manuf. industries	High-skilled	Low-skilled
NMR, HT and EPL regulatory indicators[1]	0.024***	0.031***	0.030*	0.087***
	[0.005]	[0.005]	[0.017]	[0.017]
Observations	753	2067	238	238
R-squared	0.457	0.201	0.808	0.828

*** significant at 1%; ** significant at 5%; *significant at 10%. Standard errors between brackets. Country*industry and country*year fixed effects are included.
(1): The regulation indicators are the NMR indicators in column 1, the HT indictors in column 2 and the EPL indicator in column 3 and 4.

Table D2: Dynamic adjustment calibration relationships

Dependent variable	MFP growth (Δmfp)	Relative production price growth (Δp)		Real wage growth (Δw)	
		Non-manuf.	Manuf.	High-skilled	Low-skilled
	(1)	(2)	(3)	(4)	(5)
Error Correction term (EC)	-0.215***	-0.235***	-0.025**	-0.119***	-0.066**
	[0.013]	[0.027]	[0.010]	[0.036]	[0.033]
Observations	2820	753	2067	225	225
R-squared	0.095	0.088	0.004	0.056	0.039

*** significant at 1%; ** significant at 5%; *significant at 10%. Standard errors between brackets.