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A general equilibrium analysis of the economic impact of the post-2006 EU regulation in the services sector

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Abstract. This study uses both econometric and modelling techniques to quantify the macroeconomic impact of regulatory reforms removing barriers in the European Single Market for services that have taken place in the European Union between 2006 and 2017. It also provides scenario analyses of the impact of a number of hypothetical additional reforms aimed at further reducing regulatory restrictions. The results of the modelling simulations indicate that the regulatory reforms implemented between 2006 and 2017 will result in discounted cumulative gains of 2.1% of GDP by the year 2027. Furthermore, ambitious additional reforms from 2017 onwards would generate an additional growth potential of 2.5% of GDP by 2027. Combining the realised and potential gains would result in a cumulative gain in GDP of 4.65% and a rise in employment of more than 300,000 full time equivalents by 2027. More conservative hypotheses on the additional reforms from 2017 onwards would lead to a GDP cumulative gain of 3.22% by 2027.

JEL Codes: C68, R13.

Keywords: Services regulation, general equilibrium modelling, Single Market, economic growth.

Executive summary

Services are of primary importance for the European Union (EU) economy, accounting for about 70% of GDP and a similar share of employment. Well-functioning and competitive services markets are therefore key to achieve economic growth and jobs creation in Europe. The Services Directive was adopted in 2006 with the aim to promote trade and investment in services in the EU by setting a framework for national services regulation removing unjustified regulatory and administrative barriers. The implementation of the Services Directive and the subsequent reforms encouraged by the European Semester led to the removal of a number of barriers. Nevertheless, the Single Market for services remains fragmented and service providers still face many obstacles when providing their services across borders within the EU.

The 2021 study by the European Commission on 'Mapping and assessment of legal and administrative barriers in the services sector' concluded that the removal of barriers in services sector over the recent years was slow and only led to a small decrease in the absolute level of barriers. The European Commission recently updated its reform recommendations on regulation of seven professional services and concluded that while certain reforms have taken place in some of the Member States (MS) for some of the professions, the restrictiveness indicator for all seven professions indicate that MS have made little progress in removing unjustified or disproportionate professional regulation since 2017.

Reducing regulatory restrictiveness in services would boost productivity and competitiveness of the EU services sector as well as manufacturing industries which source many services and increasingly offer their products in combination with services. It is important to quantify the impact of reducing the restrictions. Thus, this report builds on the quantification of the restrictiveness level of the EU services markets as established by the European Commission (2021b) study by quantifying the macroeconomic impact of reforms that have already taken place by 2017, and by providing estimates of the impact of hypothetical additional reforms aimed at further reducing regulatory restrictions on the Single Market for services.

According to the results of the modelling simulations, the regulatory reforms to remove barriers already implemented by the year 2017 will result in discounted cumulative gains of 2.13% of GDP by the year 2027. Furthermore, if MS were more ambitious in implementing reforms (to reach the average of the five least restrictive MS), the additional growth potential is estimated to be 2.5% of GDP by 2027. Combining the realised and potential gains would result in a cumulative gain in GDP of 4.65% by 2027. These GDP gains would be accompanied by substantial changes in employment. The ambitious reforms would bring an additional rise in employment of more than 207,000 full time equivalents (FTEs) by 2027, and, when combined with the impact of already implemented reforms, would result in a total gain of more than 300,000 FTEs in EU employment.

Thus, further regulatory reforms in the services sector could represent a significant boost for the resilience of the Single Market and a vital contribution to the EU GDP and employment.

1. Introduction

Services are of primary importance for the European Union (EU) economy, accounting for about 70% of GDP and a similar share of employment. Well-functioning and competitive services markets are therefore key to achieve economic growth and jobs creation in Europe. Historically, different approaches to services regulation have been taken in different Member States (MS).

The Services Directive was adopted (European Union, 2006) with the aim to promote trade and investment in services in the EU by setting a framework for national services regulation removing unjustified regulatory and administrative barriers. The implementation of the Services Directive and the subsequent reforms encouraged by the European Semester led to the removal of a number of barriers. Nevertheless, the Single market for services remains fragmented and service providers still face many obstacles when providing their services across borders within the EU.

A recent empirical study by Smith (2022) shows that the market integration for services in the EU has barely increased between 2008 and 2016. The European Commission (2021a) updated its reform recommendations on regulation of seven professional services and concluded that while certain reforms have taken place in some of the MS for some of the professions, the restrictiveness indicator for all seven professions indicate that MS have made little progress in removing unjustified or disproportionate professional regulation since 2017.

The study by the European Commission (2021b) on 'Mapping and assessment of legal and administrative barriers in the services sector' concluded that the removal of barriers in services sector over the recent years was slow and there was only a small decrease in the absolute level of barriers. The objective of that assessment was to take a broad view of the developments in the regulation of services markets and to obtain an overview of the remaining barriers, as well as to understand how these barriers have evolved over time. Moreover, it also aimed to quantify the presence of barriers and the level of restrictiveness with the aim to update the assessment of the economic impact of the implementation of the Services Directive.

Reducing regulatory restrictiveness in services would boost productivity and competitiveness of the EU services sector as well as manufacturing industries which source many services and increasingly offer their products in combination with services. It is important to quantify the impact of reducing the restrictions. Thus, this report builds on the quantification of the restrictiveness level of the EU services markets as established by the European Commission (2021b) study by quantifying the macroeconomic impact of reforms that have already taken place by 2017, and by providing estimates of the impact of hypothetical additional reforms aimed at further reducing regulatory restrictions on the Single Market for services.

The analysis consists of an econometric estimation of the relationship between the level of regulatory barriers and the technical inefficiency in the production process of the economy based on the observed changes over the period 2006-2017 in the EU MS. Then, the general equilibrium model RHOMOLO is used to simulate a number of scenarios producing the macroeconomic impact of various hypothetical reductions in regulatory barriers increasing productivity (the latter relationship is based on the one estimated econometrically between barriers and inefficiency in the first part of the analysis).

The results of this report are relevant for the ex-post assessment of the application of the Services Directive, as well as for supporting future policies aiming to further enhance the Single Market for services. Some of the findings are included in the Annual Single Market Report 2022 published by the European Commission (2022). Moreover, the analysis constitutes an example on how to study

the impact of reforms in a general equilibrium framework combining econometric and modelling techniques.

The remainder of this paper is structured as follows: Section 2 describes the Services Regulation and illustrates the results obtained by the European Commission (2021b). Section 3 illustrates the empirical strategy used to carry out the present assessment, distinguishing between the econometric model establishing the relationship between legal barriers and productivity, and the modelling framework used to gauge the potential macroeconomic impact of restrictions removal. Section 4 presents the results of both parts of the analysis, and Section 5 concludes.

2. The Services Regulation and the previous assessments on the existing barriers in the services sector

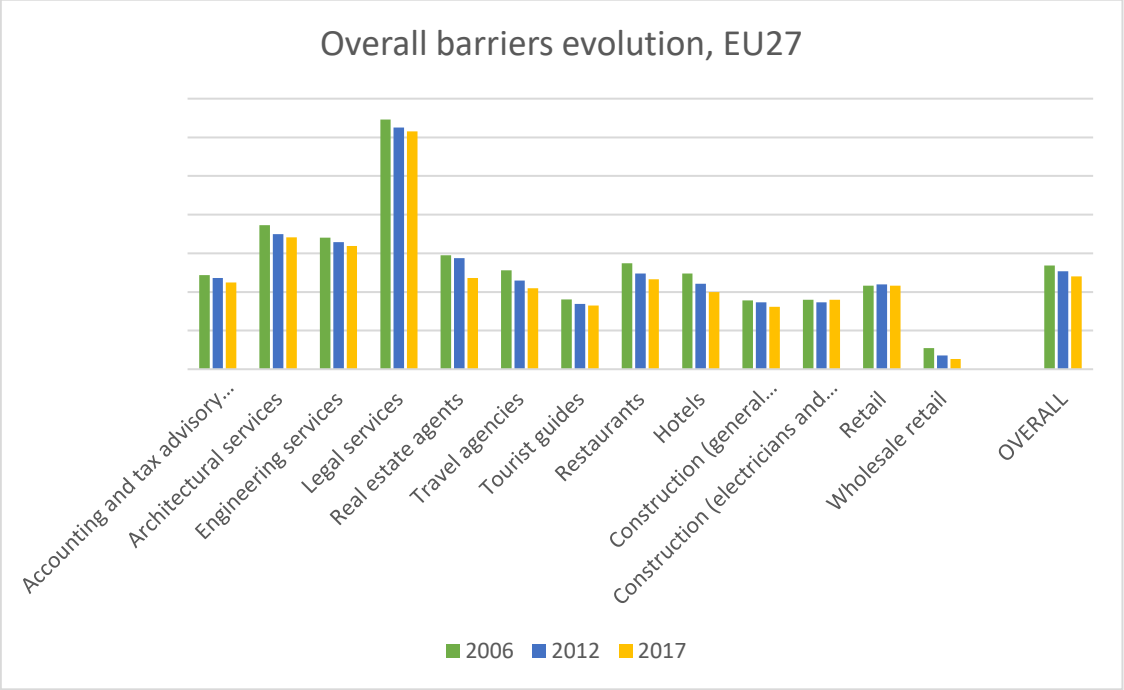
The Services Directive in its Article 41 mandates the Commission to regularly prepare a comprehensive report on the application of the Directive. The first of these reports (Monteagudo et al., 2012) included a mapping of reforms undertaken by MS during previous years and of remaining regulatory barriers. It also assessed the impact of those reforms, finding that that the estimated cumulative EU-level impact on GDP was 0.8%. The assessment also estimated that in case MS pursued a more ambitious implementation (where MS would reach the average of the five least restrictive MS), the additional cumulative growth potential would have been 1.8% of EU GDP. The analysis was updated in 2015 (European Commission, 2015) and in this updated assessment, estimating the impact of reform efforts during 2012-2014, it was found that only a fraction (0.1%) of the 1.8% GDP potential had been realized.

In terms of the scope, the European Commission's (2021b) assessment included both restrictions falling explicitly under the Services Directive in relation to the freedom of establishment and the free movement of services cross-border, as well as other related barriers. By looking at regulations in place at three different time points, in 2006, 2012 and 2017, in 13 different sectors, the assessment captured the evolution of key restrictions from the adoption of the Services Directive to after its transposition to 2017.

From 2006 to 2017, the services barriers decreased slightly in 11 out of the 13 sectors considered in the European Commission study, as shown in Figure 1. The absolute level of barriers varies greatly between sectors in the whole period of analysis.

The objective of the exercise was to document the presence or absence of restrictions. The exercise did not assess whether the relevant restriction was justified or proportionate. Consequently, for each type of restriction, it was documented whether a restriction of this type was present in the country and sector concerned. In case of the presence of the restriction, a numeric score between 0 and 1 was assigned, with 0 corresponding to an absence of all restrictions and 1 corresponding to a restriction being fully present. These scores were then used to calculate averages per sector and per country, as appropriate.

Figure 1. Overall services barriers evolution in the EU



Source: European Commission (2021b).

The European Commission (2021b) study resulted in a set of values quantifying services restrictions in the 13 key services sectors at three different time points. These values represent the main input for the econometric estimates of the economic impact of the changes in services regulation that were then used for the modelling of potential future reforms in this report, as explained in the following sections.

3. The empirical strategy

3.1 The econometric estimates on regulation and the efficiency frontier

A stochastic frontier econometric model is used to estimate the role played by sectoral regulatory barriers on the technical inefficiency in the production process. As opposed to standard econometric models, in which a single elasticity is estimated and used to predict changes in TFP for all countries, the stochastic frontier approach predicts changes in country/sector efficiency considering the characteristics of the country/sector and imposes an upper bound for improvement. The quantification of regulatory restrictiveness in services established by the European Commission (2021b) and its change over time is therefore put in relation with inefficiency in the sectors concerned.

We estimate a true fixed-effects panel data stochastic frontier model with output-oriented technical inefficiency (Greene, 2005). The model is expressed as follows:

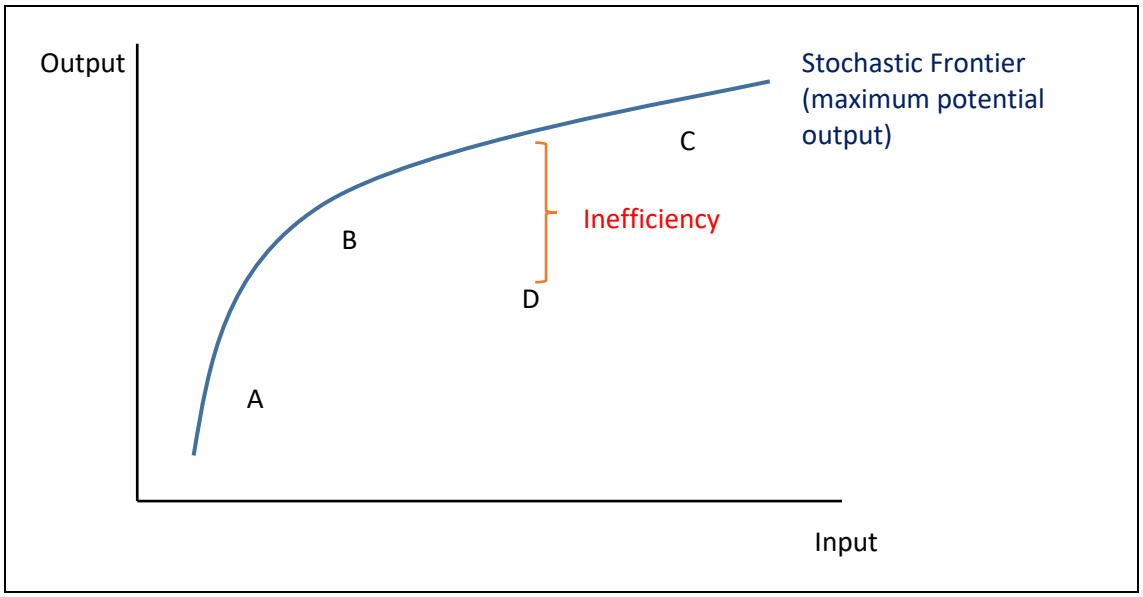
$$\ln y_{ist} = \beta_0 + \beta_1 \ln k_{ist} + \beta_2 \ln l_{ist} + \mu_i + \tau_t - u_{ist} + v_{ist} \qquad (1)$$
$$u_{ist} \sim N^{+}(0, \sigma_u^2)$$
$$v_{ist} \sim N(0, \sigma_v^2)$$

where y_{ist} is the gross value added for country i sector s at time t, k_{ist} is the capital stock and l_{ist} is the employment stock. μ_i, and τ_t are country, and time fixed effects, respectively. Finally, u_{ist} is the inefficiency term, and v_{ist} is a random noise component that affects the production process. The

noise component is normally distributed, while the inefficiency term follows a half-normal distribution.

The inefficiency term $u_{ist} \geq 0$ captures the difference between the maximum potential output that can be achieved given the country-sector's technological frontier, and the observed output (Figure 2 is a simple representation of the model). The stochastic frontier model estimates the parameters of the production function, β_1 and β_2, and separates the inefficiency term from the noise term, estimating the inefficiency of each observation.

Figure 2. Illustration of the Stochastic Frontier Approach



Note: The figure shows a series of points representing different countries' production processes and the stochastic frontier. Countries A, B, and C are close to the production frontier, showing a high level of efficiency in their production processes. However, point D represents a country where production is not as efficient as point A, B, or C, as the distance to the frontier is larger.

Countries and sectors operate under different conditions that might explain the differences in the inefficiencies of the production processes. Barriers in the services sectors is one of the factors that can explain those differences. We can express this as follows:

$$ln\ \sigma^2_{u,ist} = \gamma_0 + \gamma_1 ServRestric_{ist} \qquad (2)$$

where $\sigma^2_{u,ist}$ is the variance of the inefficiency term u_{ist}, $ServRestric_{ist}$ is the services restrictions indicator in the country, γ_0 and γ_1 are the parameters to be estimated. Both equations (1) and (2) are estimated in a single-step procedure to avoid bias in the estimation of the inefficiency (Battese and Coelli, 1995; Wang and Schmidt, 2002).

As stated above, the data on services restrictions come from the study by the European Commission (2021b). Data on sectoral gross value added, gross fixed capital formation, and employment in thousand persons is taken from Eurostat for the years 2006, 2012 and 2017. Capital stocks were constructed based on gross fixed capital formation, assuming a depreciation rate of 0.15. We collect data for the EU27, plus the United Kingdom, Iceland, and Norway. Sectoral gross fixed capital formation is missing for Croatia and, therefore, the country could not be included in the estimation of our econometric model. Descriptive statistics for the total economy are presented in Table 1.

Table 1. Descriptive statistics of the variables used in the econometric analysis

	Mean	Std. Dev.	Min	Max
Gross Value Added per capita (Million €)	18,672.48	41,735.25	52.60	310,932.00
Capital Stock (Million €)	40,383.74	146,327	1.33	1,404,353
Employment (Thousand persons)	271.35	490.43	0.53	3,034.37

Note: Unbalanced panel of 522 observations for 29 countries, 8 sectors and 3 years.

Data on legal and administrative barriers is available for 13 sectors, but Eurostat does not have data on value added, fixed capital formation, and employment at such a detailed level. Therefore, the econometric analysis is performed for eight sectors, using the average of the services restrictions indicator when needed to aggregate sectors. See Table A1 in the Appendix for the available sectors.

The technical efficiency level of countries and sectors can be estimated with the estimated parameters of the econometric model and the observed values of the variables. By changing the value of the services restrictions variable, the model can be used to predict how technical efficiency will change when relaxing the barriers in the services sectors. The empirical strategy further assumes that a reduction of sectoral regulatory barriers has positive effects on productivity. In the general equilibrium modelling part of the analysis, various alternative predicted changes in technical efficiency due to the removal of barriers are imposed on total factor productivity (TFP) in a series of scenarios to obtain their macroeconomic effects on the EU economies.

3.2 The general equilibrium modelling scenarios

RHOMOLO is a dynamic spatial computable general equilibrium model which provides analyses with sector-, region-, and time-specific results related to investment policies and structural reforms in the EU. The model is calibrated on a set of fully integrated EU regional Social Accounting Matrices (SAMs) for the year 2013, which is taken as the baseline state of the economy. The SAMs account for all the transactions in the economy: purchasing of intermediate goods, hiring of factors, and current account transactions of institutions including taxes and transfers, consumption and savings, as well as trade flows. A SAM includes more information than a simple Input-Output (IO) table (which contains information on the production and use of goods and services and the income generated in that production), as it includes data on the secondary distribution of income, detailing the roles of labour and households (Miller and Blair, 2009).

The main distinctive feature of the model lies in its regional dimension, as it is calibrated with data for 267 NUTS 2 regions of the EU27 + the UK, as well as for a residual region accounting for the rest of the World (Thissen et al., 2019). The full mathematical description of the RHOMOLO model is beyond the scope of the present report and can be found in Lecca et al. (2018).

Succinctly, the model economies are disaggregated into ten economic sectors (based on the NACE Rev. 2 industry classification), and firms are assumed to maximise profits and produce goods and services according to a constant elasticity of substitution production function. The remaining agents in the model include utility-maximising households and a government which collects taxes and spends money on public goods and transfers. Capital and labour are used as factors of production, and transport costs are based on the transport cost model by Persyn et al. (2020). The model is solved in a recursively dynamic mode, where a sequence of static equilibria is linked to each other through the law of motion of state variables. This implies that economic agents are not forward-looking and their decisions are solely based on current and past information. The RHOMOLO model is routinely used to study the macroeconomic impact of European policies (see, for example, Barbero et al., 2021), and it has been used by Christensen et al. (2019) to evaluate the regulatory restrictiveness of construction and other business sectors.

The analysis on the impact of the Services regulation is carried out by simulating a number of scenarios assuming that the policy reforms decrease the existing barriers in the heavily regulated sectors of the EU countries, leading to increases in TFP. The magnitude of these TFP changes come from the econometric analysis explained above. We further assume that TFP increases gradually over five years, after which the TFP change becomes permanent. This implies that the economy converges to a new steady state with higher GDP and employment than in the base year.

The introduction of the TFP changes works as a shock perturbing the initial steady state of the economies of the model, leading to endogenous responses of the main variables of interest. The differences between the initial values of the variables and the values assumed after the shock in the policy scenarios can be read as the effects of the removal of restrictions due to the Services regulation, and are presented as % differences from the base year values.

We consider the following scenarios:

- Scenario 1 ("Historical"): Historical change in services regulation from 2006-2017 (Implemented reforms)
- Scenario 2 ("Best five"): Removal of restrictions in all MS to at least the average best five MS (per sector)
- Scenario 3 ("Average EU"): Removal of restrictions in all MS to at least the average of all MS (per sector)
- Scenario 4 ("Ambitious"): Scenarios 1 and 2 combined
- Scenario 5 ("Conservative"): Scenarios 1 and 3 combined

Scenario 4 ("Ambitious") corresponds to the combined impact of the historical reforms already implemented in 2006-2017 (scenario 1) and of a more ambitious potential set of reforms to be undertaken as of 2017 (scenario 2). Scenario 5 ("Conservative") corresponds to the combined impact of historical reforms that already took place in 2006-2017 (scenario 1) and of a somewhat more conservative potential set of reforms to be undertaken as of 2017 (scenario 3). These scenarios allow to understand the overall impact of different policy approaches encompassing what happened historically in the various MS as well as hypothetical further actions removing existing restrictions in the services sectors.

4. Results of the analysis

4.1 The econometric results

The estimation results of the panel stochastic frontier model are presented in Table 2. Columns (I) and (II) present results for the whole sample, including EU countries plus the UK, Iceland, and Norway; the estimates of column (III) are based on data for the EU and the UK; and those of column (IV) are solely based on EU data.

Table 2. Econometric estimation results

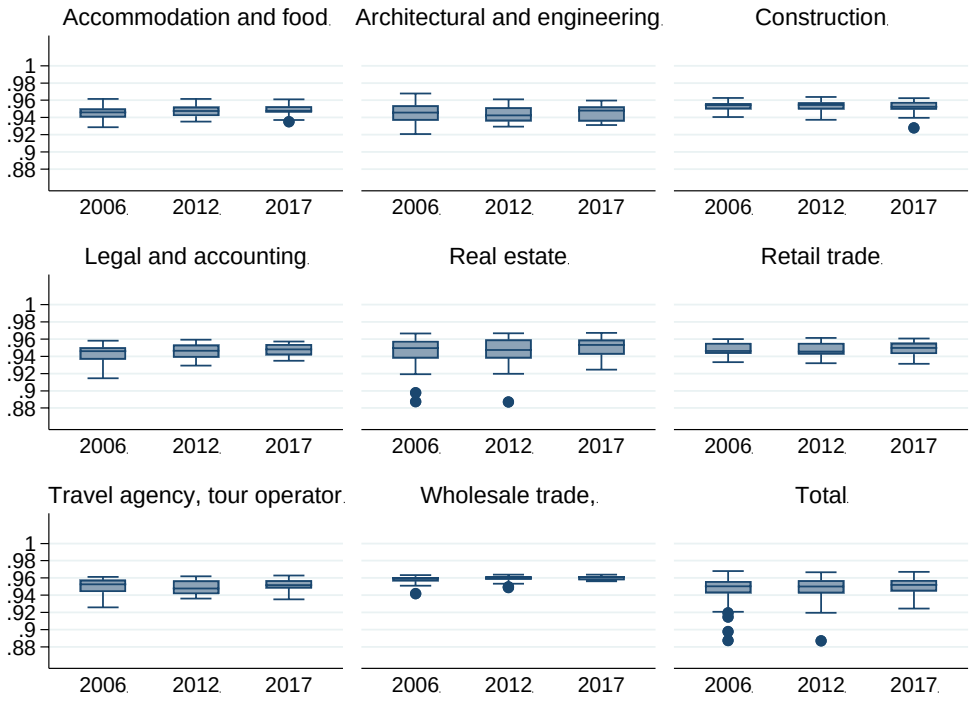
	(I)	(II)	(III)	(IV)
Countries	EU UK Iceland Norway	EU UK Iceland Norway	EU UK	EU
Frontier equation				
Log of Capital	0.548***	0.549***	0.552***	0.551***
	(0.0170)	(0.0174)	(0.0188)	(0.0196)
Log of Employment	0.340***	0.338***	0.337***	0.340***
	(0.0154)	(0.0157)	(0.0164)	(0.0170)
Constant	3.409***	3.481***	3.464***	3.446***
	(0.144)	(0.137)	(0.148)	(0.154)
Country FE	Yes	Yes	Yes	Yes
Year FE	Yes	Yes	Yes	Yes
Inefficiency:				
Services Restrictions		4.221**	4.078**	3.948**
		(1.720)	(1.711)	(1.750)
Constant		-5.687***	-5.825***	-5.880***
		(0.652)	(0.648)	(0.666)
Error: $\ln \sigma_u^2$				
Constant	-2.096***	-2.114***	-2.088***	-2.054***
	(0.130)	(0.137)	(0.143)	(0.146)
Observations	522	522	483	459
Log-likelihood	-193.71	-193.19	-184.34	-182.77

Note: Robust standard errors in parentheses. ** and *** denotes significance at the 0.05 and 0.01 levels.

The results are consistent across the four specifications of the model, with the estimated coefficients showing little variations when modifying the countries included in the sample. The estimated coefficients for capital and employment are positive and significant, with the sum of the two being close to 1, suggesting the prevalence of constant returns to scale. Columns (II) to (IV) include the services restrictions indicator as an explanatory variable of the inefficiency term. The estimated coefficient is positive and significant, indicating that tighter restrictions in the services sectors are associated with larger inefficiencies in the economy. Thus, a reduction in legal and administrative barriers in the services sectors is associated with higher efficiency.

Figure 3 presents the predicted technical efficiency for the eight sectors included in the econometric analysis in 2006, 2012, and 2017, based on the coefficients of column (IV) of Table 2. The graph shows that the average technical efficiency has increased over time in all sectors, while dispersion has decreased almost everywhere. This signals that the EU economies have improved their performance over time according to this indicator.

Figure 3. Predicted technical efficiencies



Source: own calculations.

The results reported above can be used to predict how technical efficiency changes when legal and administrative barriers in the services sector change. The predicted change in technical efficiency can be introduced as a TFP shock into the general equilibrium model. Before doing so, there are two important caveats to consider: (i) the sectors in the general equilibrium model are more aggregated than the sectors used in the econometric analysis; and (ii) data for Croatia, and for some sectors in other countries, are not available in the econometric analysis. Therefore, a proxy is needed to predict the technical efficiency change for the missing sectors.

The difference in the sectoral aggregation is solved by calculating a weighted average of the predicted efficiency change, using the sectoral value added shares as weights. See table A1 in the appendix for the sectors aggregation from the services indicator to the econometric analysis and the RHOMOLO model.

We estimate the following auxiliary econometric model to fill the missing values for the predicted technical efficiency change for Croatia and the missing sectors in some countries:

$$\Delta TE_{is} = \beta_0 + \beta_1 \Delta ServRestric_{is} \qquad (3)$$

where ΔTE_{is} is the predicted technical change estimated using model (IV) of Table 2 for country i and sector s, using the full sample, and $\Delta ServRestric_{is}$ is the change in the services restriction indicator in the scenario under analysis.

The econometric model is estimated for the technical efficiency change for scenarios 1 to 3.[1] Equation (3) is used to predict the technical efficiency change for the missing values generated in the estimation of the stochastic frontier model. The estimation results are available in Table A2 in the Appendix.

4.2 The modelling simulations

This section of the paper presents the estimated economic gains from the removal of restrictions based on the five scenarios explained above. The results are expressed as cumulative discounted gains in GDP expressed as a proportion of base year GDP, as explained in Section 3.2. The compound EU27 EMU convergence rate[2] for the period 2001-2020 is used as the nominal discount rate, with a yearly value of 3.2%. As we consider GDP gains in fixed prices, we use the annual real interest rate of 1.5% for discounting. This is calculated using the compound nominal interest rate and the compound inflation rate of the GDP deflator of 1.6%. The RHOMOLO model is calibrated to a steady state corrected for the trend real growth rate. Hence, the trend GDP growth is added to the GDP gains from the model (the EU27 annual trend growth for the period 2001-2020 is 1.0%).[3]

Figures 4 and 5 show the cumulative discounted GDP gains expressed as percent of the base year GDP generated by the removal of barriers for the various scenarios introduced above. Note that the cumulative discounted GDP gains rise over time, due to the assumption that the regulatory changes result in a permanent rise in GDP (in other words, the effects on productivity are assumed to be permanent).

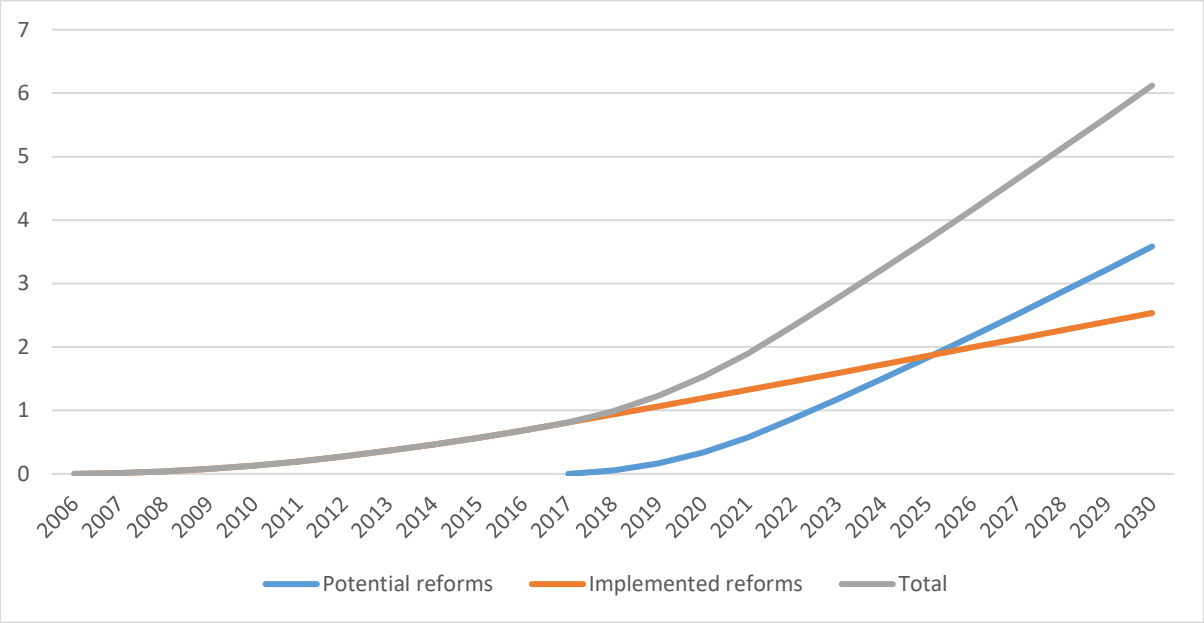
In Figure 4, the orange line (overlapping with the grey line until 2017) shows the GDP changes associated with scenario 1 (Historical), accounting for the implemented reforms up to 2017. By 2027, those reforms lead to a GDP level which is 2.13% above the base year one, in the absence of further actions. The blue line shows the GDP changes associated with scenario 2, with reforms started in 2017 leading to a removal of restrictions to the provision of services and simplification of administrative procedures such that all MS reach at the least the average of the five best performing ones. This would yield a cumulative discounted GDP gain of 2.52% of base year GDP by 2027. Combining the realised and potential gains (this would correspond to scenario 4) would result in a cumulative discounted gain in GDP of 4.65% of base year GDP by 2027, as shown by the grey line in Figure 4.

[1] As scenarios 4 and 5 are combinations of the previous scenarios, there is no need to estimate the auxiliary econometric model.

[2] The EMU convergence rate covers bond yields for government bonds closest to 10-year maturity.

[3] Adding trend growth to the model output is equivalent to deflating the raw model output with a growth corrected real interest rate of 0.4% yearly.

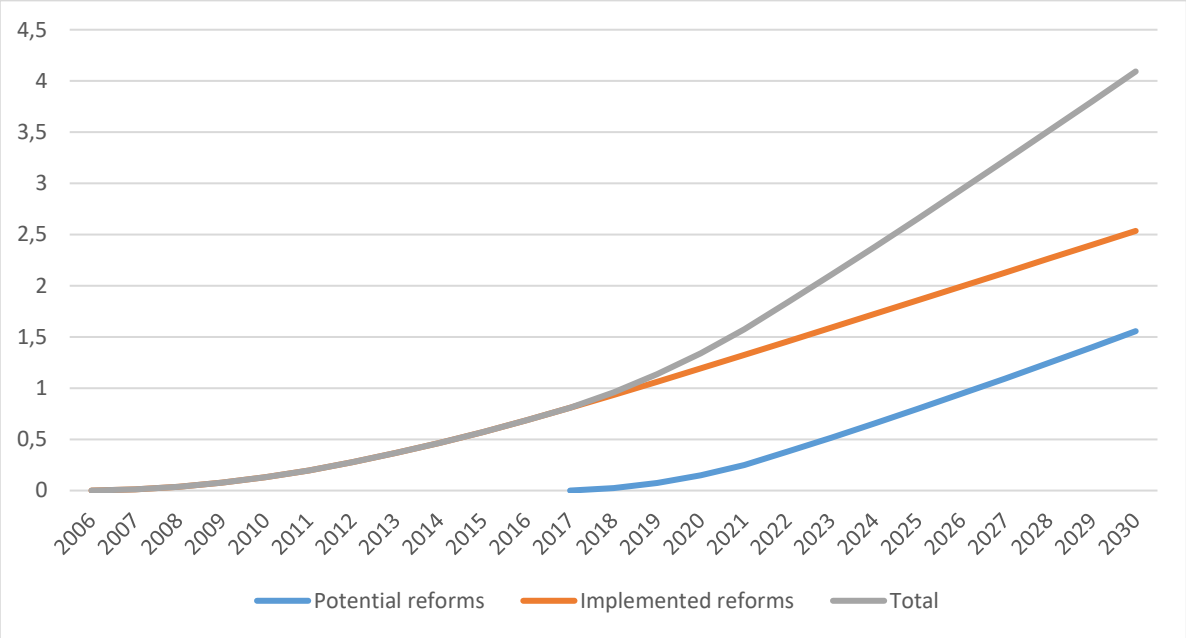
Figure 4. Cumulative discounted GDP gains from the removal of barriers in the services sector- Scenarios 1 ("Historical" - orange line), 2 ("Best five" - blue line), and 4 ("Ambitious" - grey line)



Source: RHOMOLO simulations.

Figure 5 shows once again the GDP changes associated with the Historical scenario (orange line), but in combination with those of scenarios 3 ("Average EU" - blue line) and 5 ("Conservative" - grey line). In scenario 3, the further potential reforms started in 2017 would only lead all MS to at least the EU average level, with important but smaller discounted gains than those of scenario 2. By 2027, these less ambitious additional regulatory reforms would yield cumulative discounted gains of 1.09% of GDP, resulting in a total (when added to the gains of the already implemented reforms) cumulative discounted GDP gain of 3.22% by 2027 (scenario 5).

Figure 5. Cumulative discounted GDP gains from the removal of barriers in the services sector- Scenarios 1 ("Historical" - orange line), 3 (EU average - blue line), and 5 ("Conservative" - grey line)



Source: RHOMOLO simulations.

The results illustrated in Figures 4 and 5 are summarised in Table 3 below, presenting the values of cumulative discounted GDP gains for various time horizons.

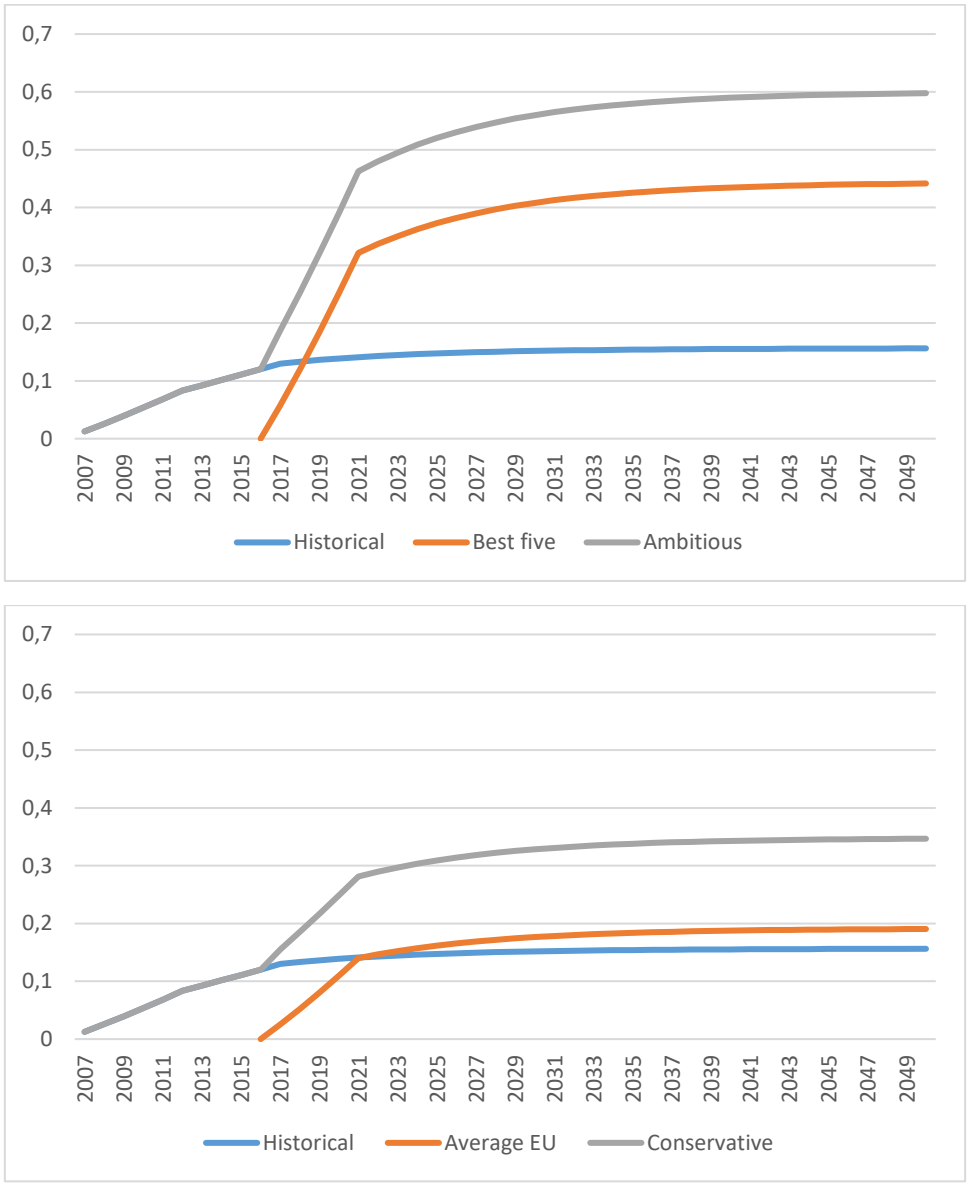
Table 3. Cumulated discounted GDP gains as % of base year GDP - all scenarios

	2007-2022	2007-2025	**2007-2027**	2007-2030
"Historical" (scenario 1)	1.46	1.86	**2.13**	2.54
"Best five" (scenario 2)	0.87	1.83	**2.52**	3.58
Total (scenario 4 "Ambitious")	2.33	3.69	**4.65**	6.12
"Historical" (scenario 1)	1.46	1.86	**2.13**	2.54
"Average EU" (scenario 3)	0.38	0.80	**1.09**	1.56
Total (Scenario 5 "Conservative")	1.84	2.66	**3.22**	4.09

Source: RHOMOLO calculations. Note: the results in bold refer to the time period of ten years after the start of the hypothetical reforms, used as a reference point in the main text of this report and in the Annual Single Market Report 2022 (European Commission, 2022).

An alternative way to present the results would be to consider the annual GDP deviation from the no-policy baseline. This is illustrated in Figure 6 below. The top panel shows the changes in GDP for the realised regulatory changes (scenario 1: blue line) and the potential improvement of the regulatory environment of scenario 2 (orange line), as well as the two combined together (scenario 4, "Ambitious": grey line). The bottom panel shows similar results for scenarios 1 (blue line), 3 (orange line), and 5 ("Conservative", grey line). Obviously, in the latter case the numbers are lower than in the "Ambitious" scenario whose results are reported in the top panel of Figure 6.

Figure 6. EU27 GDP impacts, % deviation from baseline - all scenarios



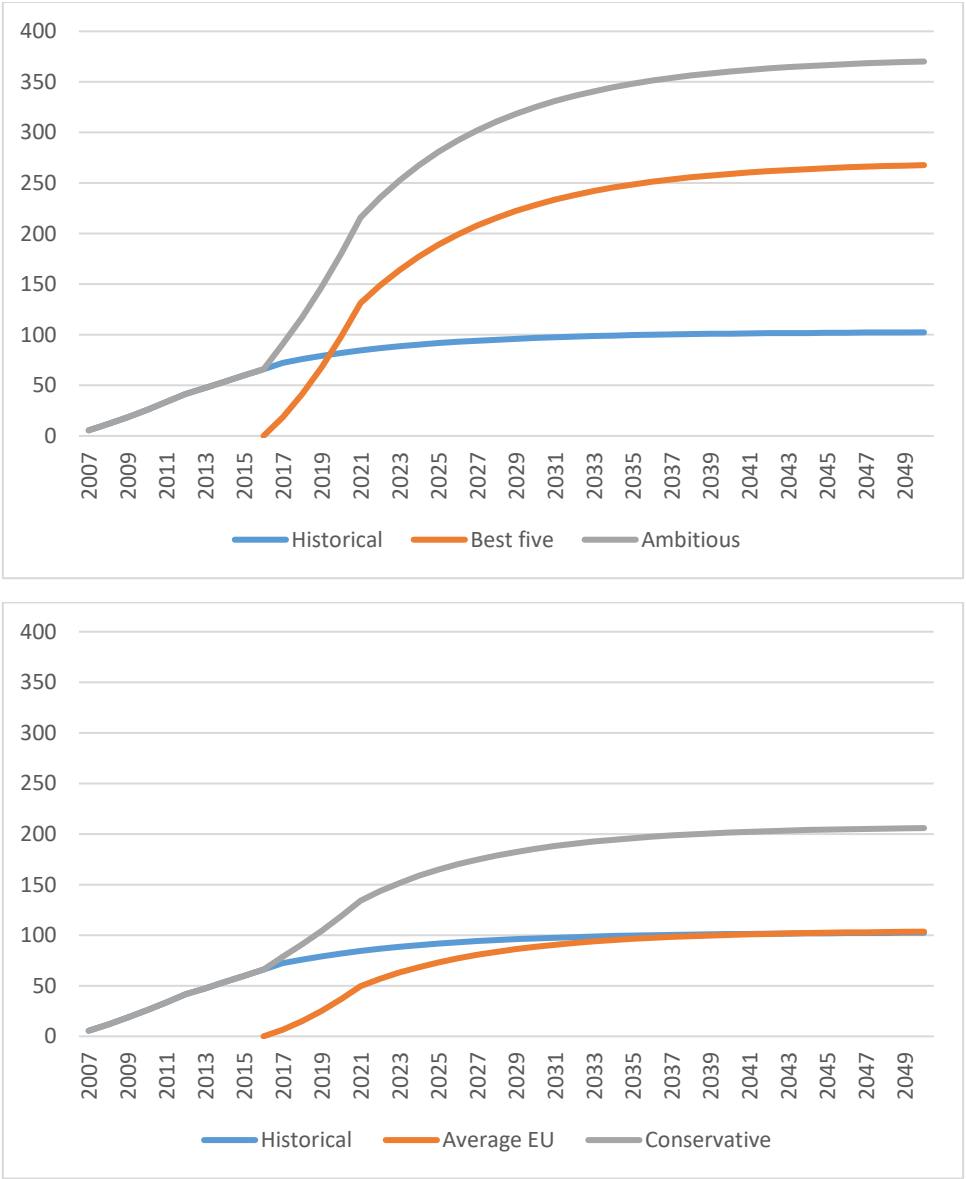
Source: RHOMOLO simulations.

Figure 6 demonstrates that the effects of the removal of barriers increase over time, eventually leading to a new steady state with a higher GDP level with respect to the base year one. According to the simulations presented so far, the realised regulatory changes between 2006 and 2017 lead to a long-term rise in GDP of 0.16% relative to the baseline (scenario 1, blue line). Removing restrictions so that all MS reach at least the best five performers would further increase the long term GDP gain by 0.44% (top panel, scenario 2, orange line), resulting in a total long-term GDP gain of 0.60% with respect to the base year GDP (top panel, scenario 4, grey line). Removing restrictions so that all MS reach at least the sectoral EU average would increase the long term gain in GDP by 0.19% (bottom panel, scenario 3, orange line) resulting in a total long term rise in GDP of 0.35% relative to the no policy baseline (bottom panel, scenario 5, grey line). A substantial part of these gains is already realised by 2027: in particular, the 2027 GDP of scenario 4 ("Ambitious") is more than 0.50% above the base year GDP (compared to the long run gain of 0.60%). In scenario 5 ("Conservative"), the 2027 GDP difference from the base year value is above 0.30%, which becomes 0.35% in the long run.

Figure 7 (organised like Figure 6) shows the annual deviation in employment measured in thousands of full time equivalents (FTEs). The realised regulatory changes considered by scenario 1 ("Historical" - blue line) lead to a long-term rise in employment of more than 100,000 FTEs. The ambitious regulatory reforms of scenario 2 (orange line) would bring a long term rise in employment of more than 260,000 FTEs, which combined with those of the implemented reforms would bring the total employment change to more than 360,000 FTEs (scenario 4, "Ambitious" - grey line). Most of the change would already be attained by 2027 (about 300,000 FTEs).

According to Figure 7's bottom panel, the reforms considered in the "Conservative" scenario (number 5, combining scenarios 1 and 3) would bring a long-term gain in employment of slightly above 200,000 FTEs (175,000 FTEs by 2027 already).

Figure 7. EU27 employment impacts, 1000 FTE - All scenarios



Source: RHOMOLO simulations.

The results presented so far consider the removal of barriers in all the sectors included in the analysis at the same time. It is interesting to quantify the contribution of the eight sectors included in the analysis, which in the modelling part of it are reduced to four as per Table A1 in the Appendix: F (construction), G_I (wholesale and retail trade, transportation and storage…), K-L (finance,

insurance, and real estate activities), and M-N (professional scientific and technical activities…). Table 4 reports this information for scenarios 1 ("Historical") and 2 ("Best five"), showing a substantial difference between the two in terms of sectoral contribution to the long term GDP impact of the removal of barriers. The numbers depend both on the magnitude of the simulated sectoral shock, and on the importance of the specific sectors for the overall GDP of the economy. In particular, the hypothetical reforms assumed to take place from 2017 onwards would lead to a more balanced decomposition of the economic effect with respect to the historical reforms.[4]

Table 4. Long term GDP impact decomposition by sector

	RHOMOLO sectors:			
Scenarios:	F	G_I	K-L	M-N
"Historical" (scenario 1)	5.6%	9.2%	76.0%	9.2%
"Best five" (scenario 2)	14.8%	25.5%	35.9%	23.8%

Source: RHOMOLO calculations.

5. Conclusions

This report quantifies the macroeconomic impact of regulatory reforms aimed at removing barriers in services sectors in the EU. The analysis makes use of both econometric and modelling techniques in order first to quantify the impact of the reforms that were already implemented between 2006 and 2017, and then to assess the potential impact of additional reforms further reducing regulatory restrictions on the Single Market for services according to two scenarios, one more ambitious than the other.

According to the results of the modelling simulations, the regulatory reforms to remove barriers already implemented by the year 2017 will result in discounted cumulative gains of 2.13% of GDP by the year 2027 (in terms of the 2017 EU27 GDP, this would result in almost €280 billlion). Furthermore, if MS were more ambitious in implementing reforms (to reach the average of the five least restrictive MS), the additional growth potential is estimated to be 2.52% of GDP by 2027 (that is, almost €330 billion). Combining the realised and potential gains would result in a cumulative gain in GDP of 4.65% by 2027 (equivalent to more than €608 billion in terms of the EU27 GDP in 2017). These ambitious reforms would increase the long term gain in GDP by 0.44%, resulting in a total long-term gain of 0.60% when combined with the change generated by the already implemented reforms. These GDP gains would be accompanied by substantial changes in employment. These ambitious reforms would bring an additional rise in employment of 260,000 FTEs and when combined with already implemented reforms would result in the total gain of 360,000 FTEs in EU employment in the long term (equivalent to, respectively, 0.14% and 0.19% of the 2017 EU27 employment).

Thus, further regulatory reforms in the services sector could represent a significant boost for the resilience of the Single Market and a vital contribution to EU GDP and employment.

[4] Additional sector-specific results are available in the Appendix. Figures A1 to A5 show the percentage deviations from baseline of the EU sectoral value added for the four services sectors for which the removal of barriers is simulated in the five scenarios of the analysis. The impact depends both on the direct effect of the TFP increase due to the removal of barriers, and on the inter-sectoral interactions endogenous to the model.

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Appendix

Table A1. Sector aggregation

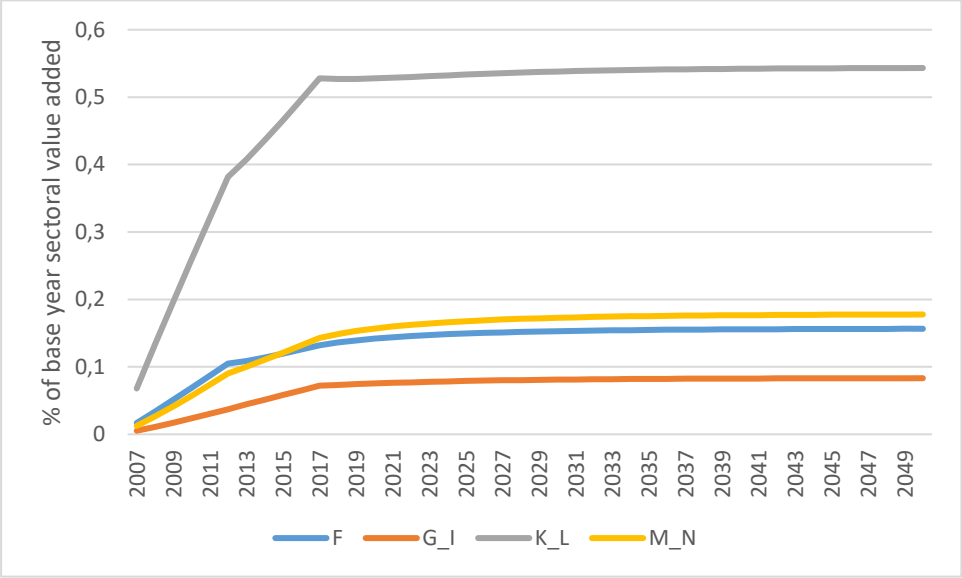
Services Sectors	**Eurostat Sectors**	**RHOMOLO Sectors**
Construction general contractor Construction one spec. craft	F. Construction	F. Construction
Wholesale retail trade services	G46. Wholesale trade, except of motor vehicles and motorcycles	G-I. Wholesale and Retail Trade; Repair of Motor Vehicles and Motorcycles + Transportation and Storage + Accommodation and Food Service Activities
Retail sector	G47. Retail trade, except of motor vehicles and motorcycles	
Restaurants Hotels	I. Accommodation and food service activities	
Real estate agents services	L68B. Real estate activities excluding imputed rents	K-L. Financial and Insurance Activities/ Real Estate Activities
Accounting services Legal services	M69_70. Legal and accounting activities; activities of head offices; management consultancy activities	M-N. Professional, Scientific and Technical Activities + Administrative and Support Service Activities
Architectural services Engineering services	M71. Architectural and engineering activities; technical testing and analysis	
Tourist guide services Travel agencies	N79. Travel agency, tour operator reservation service and related activities	

Table A2. Auxiliary econometric model results

	Scenario 1		Scenario 2	Scenario 3
	2006	2017		
$\Delta ServRestric_{is}$	-0.123***	-0.128***	-0.103***	-0.113***
	(0.011)	(0.012)	(0.003)	(0.000)
Constant	-0.000	-0.000	-0.000	-0.000
	(0.000)	(0.000)	(0.000)	(0.000)
Observations	173	173	173	173
R-squared	0.954	0.964	0.958	0.967

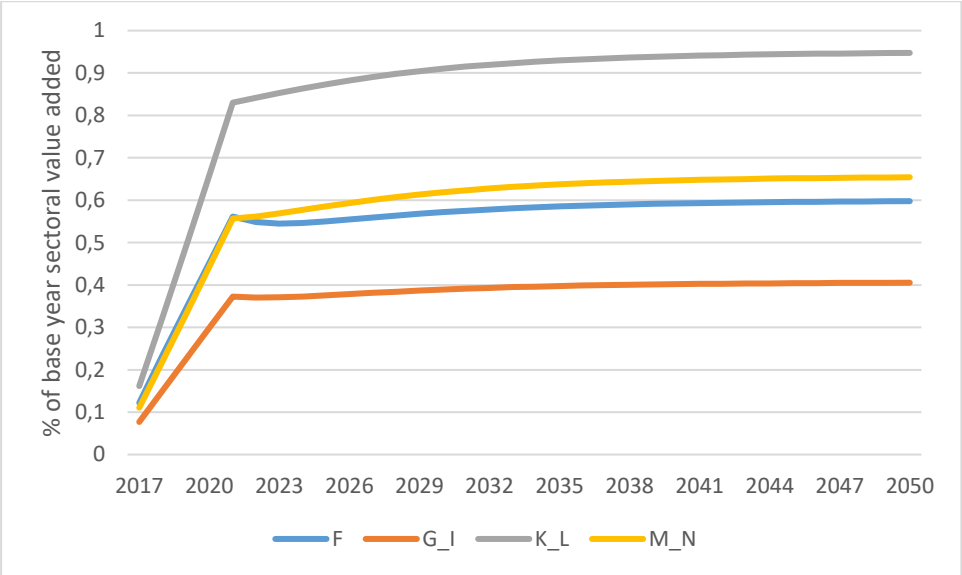
Note: Robust standard errors in parenthesis. *** denotes significance at the 0.01 level. The dependent variable is the change in technical efficiency.

Figure A1. EU27 sectoral value added impacts on the four services sectors impacted by the removal of barriers, % deviation from baseline - Scenario 1 ("Historical")



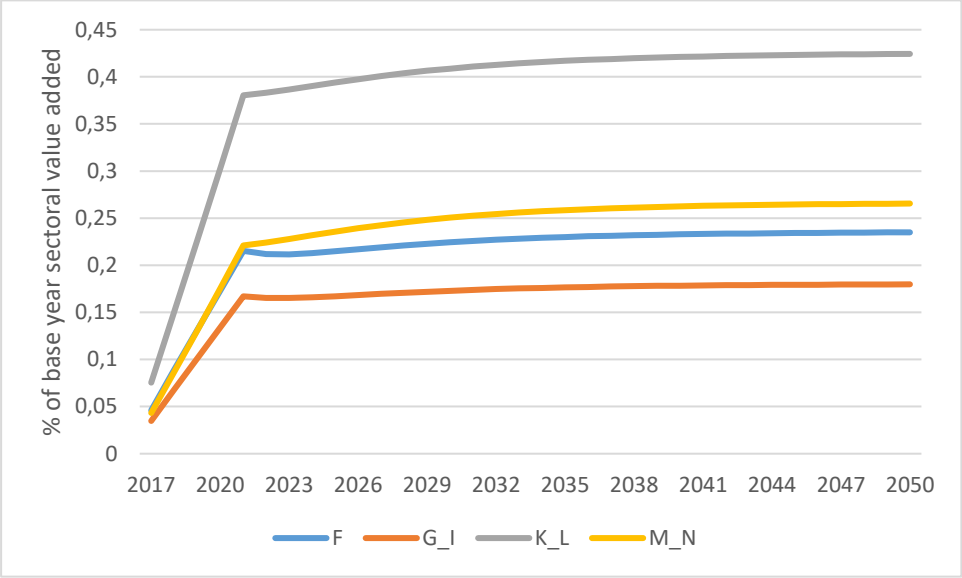
Source: RHOMOLO simulations.

Figure A2. EU27 sectoral value added impacts on the four services sectors impacted by the removal of barriers, % deviation from baseline - Scenario 2 ("Best five")



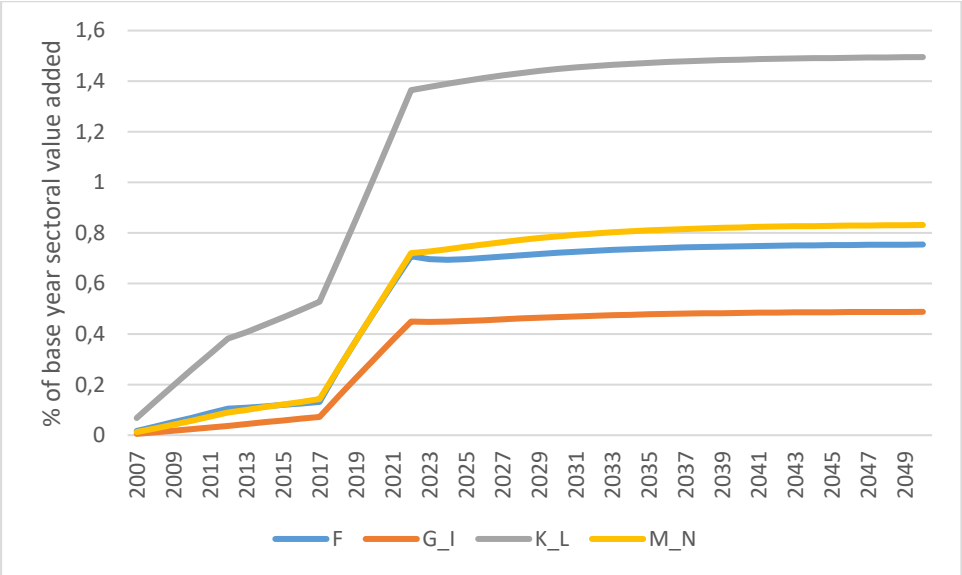
Source: RHOMOLO simulations.

Figure A3. EU27 sectoral value added impacts on the four services sectors impacted by the removal of barriers, % deviation from baseline - Scenario 3 ("Average EU")



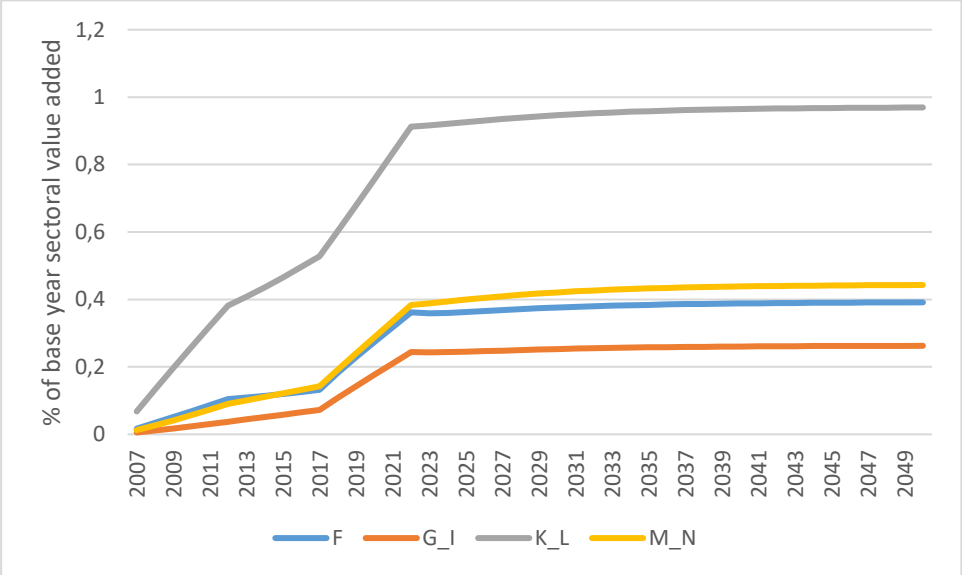
Source: RHOMOLO simulations.

Figure A4. EU27 sectoral value added impacts on the four services sectors impacted by the removal of barriers, % deviation from baseline - Scenario 4 ("Ambitious")



Source: RHOMOLO simulations.

Figure A5. EU27 sectoral value added impacts on the four services sectors impacted by the removal of barriers, % deviation from baseline - Scenario 5 ("Conservative")



Source: RHOMOLO simulations.

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