**Federal Planning Bureau**
*Economic analyses and forecasts*

# Economic impact of professional services reform in Belgium

## A DSGE simulation

Mathias Ingelbrecht, Mathias.Ingelbrecht@economie.fgov.be
Chantal Kegels, ck@plan.be
Dirk Verwerft, dv@plan.be

# Federal Planning Bureau

**Federal Planning Bureau**
Avenue des Arts - Kunstlaan 47-49, 1000 Brussels
phone: +32-2-5077311
fax: +32-2-5077373
e-mail: contact@plan.be
http://www.plan.be

# Economic impact of professional services reform in Belgium

## A DSGE simulation

### June 2018

Mathias Ingelbrecht, Mathias.Ingelbrecht@economie.fgov.be
Chantal Kegels, ck@plan.be
Dirk Verwerft, dv@plan.be

**Abstract** – This working paper analyses the economic impact of a regulated professional services reform in Belgium through simulations based on the European Commission's DSGE model, QUEST III R&D.

# Table of contents

# List of tables

# List of graphs

# Executive summary

This working paper reports the results of a macroeconomic impact assessment of the reforms in three regulated professional services in Belgium, namely legal, accounting and architectural services. Beyond their direct contribution to the economy, these services are economically relevant because they are closely linked to the other industries not only as user of inputs but mainly as providers of inputs for the rest of the economy. The reforms correspond to a decrease in the Non-Manufacturing Regulation (NMR) index of the OECD based on experts' judgement for the accounting and architect 's services and on a corresponding change in the legal services index. Two scenarios of reform are simulated, a light scenario corresponding to a decrease of the Belgian NMR index from the current 2.63 to 2.16, and a strong scenario resulting in an index of 1.74.

The potential economic impacts of these two scenarios of reform are simulated using the European Commission's DSGE QUEST III R&D model. The structural parameters of the model impacted by the reforms are the mark-up in professional services and the TFP both in the professional services and in the downstream industries. The results show that the limited reform corresponding to the light scenario may already increase GDP by 0.15% after 3 year, culminating in a 0.21% rise after 20 years. The more ambitious reform scenario, reducing the degree of regulation in Belgium to a level below the EU average but still considerably higher than the EU's three least regulated countries (Denmark, Finland and Sweden), would increase GDP by 0.29% in the third year and 0.39% after 20 years. Moreover, as these reforms are fiscally neutral and boost GDP growth, they create some room for fiscal manoeuvre that could be used to decrease taxes or the public debt ratio.

# Synthèse

Ce working paper présente les résultats de l'évaluation de l'impact macro-économique de réformes dans trois services professionnels réglementés, à savoir les services légaux, comptables et d'architectes. Au-delà de leur contribution directe à l'économie, ces services sont économiquement pertinents parce qu'ils sont étroitement liés aux autres branches d'activités, non seulement en tant qu'utilisateurs d'intrants, mais surtout en tant que fournisseurs d'intrants pour le reste de l'économie. Les réformes se traduisent en une diminution de l'indice de réglementation du secteur non manufacturier (NMR) de l'OCDE sur base du jugement des experts pour les services comptables et d'architectes et d'un changement correspondant pour les services légaux. Deux scénarios de réforme sont simulés, un scénario léger correspondant à une diminution de l'indice NMR de la Belgique de 2,63 à 2,16 et un scénario ambitieux amenant l'indice à 1,74.

Les impacts économiques potentiels de ces deux scénarios de réforme sont simulés à l'aide du modèle DSGE de la Commission européenne, QUEST III R&D. Les paramètres structurels du modèle impactés par la réforme sont la marge bénéficiaire (mark-up) des services professionnels et la PTF tant dans les services professionnels que dans les branches d'activité en aval. Il s'avère que la réforme limitée correspondant au scénario léger peut déjà augmenter le PIB de 0,15 % après trois ans, pour atteindre une hausse de 0,21 % après 20 ans. Le scénario de réforme plus ambitieux, qui ramènerait le degré de réglementation en Belgique à un niveau inférieur à la moyenne de l'UE mais encore nettement plus élevé que celui des trois pays les moins régulés de l'UE (Danemark, Finlande et Suède), augmenterait le PIB de 0,29 % la troisième année et de 0,39 % après 20 ans. De plus, comme ces réformes sont budgétairement neutres et stimulent la croissance du PIB, elles créent une marge de manœuvre budgétaire qui pourrait être utilisée pour réduire les impôts ou le ratio de la dette publique.

Synthèse

# Synthese

Deze Working Paper presenteert de resultaten van de macro-economische impactevaluatie van de hervormingen in drie gereglementeerde professionele diensten: juridische diensten, boekhouders en architecten. Naast de rechtstreekse bijdrage van die diensten tot de economie zijn ze ook economisch relevant omdat ze nauw verbonden zijn met andere bedrijfstakken, niet alleen als gebruikers van inputs maar vooral als leveranciers van inputs voor de rest van de economie. De hervormingen vertalen zich in een daling van de Reguleringsindex van de niet-verwerkende nijverheid (NMR) van de OESO op basis van adviezen van experten voor de boekhoudkundige diensten en architecten en een overeenkomstige wijziging voor de juridische diensten. Er worden twee hervormingsscenario's gesimuleerd: een licht scenario dat overeenstemt met een daling van de NMR-index van België van 2,63 tot 2,16 en een sterk scenario dat overeenstemt met een index van 1,74.

De potentiële economische impact van die twee hervormingsscenario's wordt gesimuleerd aan de hand van het DSGE-model van de Europese Commissie, QUEST III R&D. De structurele parameters van het model die worden beïnvloed door de hervorming zijn de winstmarge (mark-up) van de professionele diensten en de TFP zowel in de professionele diensten als in de stroomafwaartse bedrijfstakken. Het blijkt dat de beperkte hervorming die overeenkomt met het lichte scenario al kan leiden tot een stijging van het bbp met 0,15 % na drie jaar en tot een toename met 0,21 % na 20 jaar. Het meer ambitieuze hervormingsscenario, dat de mate van regulering in België zou terugbrengen tot een niveau onder het EU-gemiddelde, maar nog steeds aanzienlijk boven het niveau in de drie minst gereguleerde EU-landen (Denemarken, Finland en Zweden), zou het bbp het derde jaar verhogen met 0,29 % en met 0,39 % na 20 jaar. Aangezien die hervormingen bovendien budgettair neutraal zijn en zich vertalen in een hogere bbp-groei creëren ze budgettaire manoeuvreerruimte die zou kunnen worden gebruikt om de belastingen of de schuldgraad te verlagen.

# Introduction

After the entry into force of the Single Market for Goods, the adoption of the Services Directive in 2006[1] and its implementation by all EU countries in 2009 launched the creation of the Single Market for Services. To further improve this market, the European Parliament and the Council of the European Union adopted in 2013 the Directive[2] modernising the Professional Qualifications Directive of 2005. In January 2017, the Services Package was adopted to make it easier for professionals to provide services to 500 million potential European customers. It includes a proportionality assessment of national rules on professional services and a guidance for national reforms in the regulation of professions.

A regulated profession is defined[3] as "a professional activity or group of professional activities, access to which, the pursuit of which, or one of the modes of pursuit of which is subject, directly or indirectly, by virtue of legislative, regulatory or administrative provisions to the possession of specific professional qualifications". This definition covers a wide range of activities which varies across the European countries. According to the database on regulated professions of the European Commission[4], 132 professions are regulated in Belgium, mostly in health and social services (39.4% of the total number of regulated professions), business services (13.6%) and public services and education (16.7%).

The European Commission is also paying increasing attention to the well-functioning of services markets and to the removal of regulations which excessively hamper competition[5]. In July 2017, the Council of the European Union recommended that Belgium take action to "increase competition in professional services markets and retail, and, enhance market mechanisms in network industries" as part of the third country specific recommendation. More recently, the Belgian Prices Observatory published in its 2017 annual report an analysis of four regulated professional services investigating the links between the level of regulation and the market performances (churn rate, allocative efficiency, and profitability). The tentative conclusion of this study seems to validate for some professional services the relationship between the higher level of regulation and the lower market performances.

This working paper focuses on these important regulated business services: legal, accounting, architectural and engineering activities. It investigates the potential economic impacts on the Belgian economy of reforms in these regulated professional services, using the European Commission's QUEST III R&D model. The engineering profession is not part of the simulation because these activities are not specifically regulated as shown by their OECD regulation index set at zero. The results show that a limited reform of the legal, accounting and architectural professions may already increase GDP by 0.15% after 3 year, culminating in a 0.21% rise after 20 years. A more ambitious reform, reducing the degree of regulation in Belgium to a level below the EU average but still considerably higher than that of the EU's three least regulated countries (Denmark, Finland and Sweden), would increase GDP by 0.29% in the third year and 0.39% after 20 years.

---

[1]    http://eur-lex.europa.eu/legal-content/EN/TXT/?uri=CELEX:32006L0123&locale=en.
[2]    Directive 2013/55/EU.
[3]    Professional Qualifications Directive 2005/36/EC, Art 3.1.
[4]    database on regulated professions.
[5]    See, a. o., European Commission (2017).

The paper is organised as follows. After a first section surveying the economic literature on the expected effects of the liberalisation of regulated professions, the second section briefly presents the relative importance of the selected regulated professional services for the Belgian economy[6]. The third section describes the impact assessment methodology and the fourth section presents the simulation results. Finally, the last section concludes and discusses the analysis' limitations as well as directions for future research.

---

[6]     This section is written by M. Ingelbrecht, FPS Economy.

# 1. Theory and empirical evidence

## 1.1. Market failures justify regulations

Market failures are frequently presented as justification of regulations. These failures prevent or make difficult the efficient allocation of resources by the freely-working market. Market failures can occur for a variety of reasons: a situation of monopoly or of a high concentration such as in the network industries (transport, energy or communications), the presence of externalities (both positive or negative) such as with private R&D investment or asymmetric information between sellers and buyers such as in professional services. In this case, the clients have not enough information or knowledge to be able to judge the quality of the service they buy. As underlined in Canton, Ciriaci and Solera (2014), even after the service delivery, the buyer is not able to judge its quality and makes his decision on the expected average quality. The service provider is therefore in a position of power to impose a higher price or to deliver a lower quality service[7]. The government's intervention is needed to guarantee that the price correctly reflects the product quality. The government can require professional qualifications for the provider, impose information disclosure obligations, regulate prices, introduce authorisation to deliver the service or put in place labels. According to the OECD Product Market Regulation index, two main areas of regulation can be distinguished: regulation defining the conditions of profession access and regulation affecting the conduct of profession.

## 1.2. Regulations can be excessive

If market failures justify public intervention, there is no guarantee that regulations are the best instrument for this intervention, that the level of regulations is the appropriate one or that regulations are not becoming obsolete over time.

If not well designed and implemented, regulation can create undue competition restrictions limiting consumer choice and/or increasing prices. Moreover, by limiting competition, regulation can hamper productivity growth. On the one hand, by limiting competition pressures on the incumbents, they have less incentives to invest and to innovate. On the other hand, the downstream businesses also have less incentives to innovate as their innovation rent can be captured by the upstream enterprises (Cette, Lopez and Mairesse (2014, 2017), Bourlès, Cette, Lopez, Mairesse and Nicoletti (2013)). Therefore, a lower level of service regulation is expected to increase value added, productivity and export growth in downstream service-intensive industries (Baronne and Cingano (2011)). Moreover, regulation can reduce allocative efficiency if resources are trapped into inefficient firms protected from exiting by regulation while potentially more efficient new entrants cannot access the market (Canton, Ciriaci and Solera (2014), ElFayoumi, Ndoye, Nadeem and Auclair (2018)).

---

[7]  In some cases, the market of high quality services even fails as underlined by Akerlof (1970).

## 1.3. Reforms are growth-enhancing

The empirical literature on the macroeconomic impact of structural reforms is flourishing and finds that structural reforms have in general a positive impact on output and employment. The European Commission as other international organisations has published several quantifications of the consequences of services sector liberalisation. In a first attempt to assess the economic impact of the Services Directive, Monteagudo, Rutkowski and Lorenzati (2012) estimated that the reforms implemented up to 2012 following the adoption of the Directive in 2006 would yield a 0.8% GDP increase in the EU over the next few years. In 2015, a European Commission Staff working document estimated the impact of the reforms implemented from 2012 to 2014 at only 0.1% GDP increase. This corresponds only to a small fraction of the expected 1.8% GDP additional growth potential estimated if all Member States reach the average of the five least restrictive Member States. In the same vein, the World Bank (2016) indicated that limiting service sector restrictions to the level of the three least regulated Member States (UK, Denmark and Sweden) would increase the productivity of services and manufacturing firms by up to 5.3% within two years of implementation. Bouis and Duval (2011) showed that the convergence of product market regulation in each upstream sector to the average of the three least regulated sector across OECD countries could raise total factor productivity (TFP) levels by 0.5 to 3.5% after 5 years and by 1.5 to 10% after 10 years depending on the countries considered. In this study, Belgium appears to be in the third position of countries benefiting the most from the reform after Japan and Poland. Egert and Gal (2017) simulated the effect of product market reform (through a change in the ETCR indicator[8]) on GDP per capita through the components of the production function (TFP, capital deepening and employment rate). They found that a decrease of 0.31 of the ETCR indicator allows an additional increase in GDP per capita by 0.72% after 5 years and by 2.09% on the long run.

The assessment of macroeconomic effects focused on specific measures such as the liberalisation of regulated professional services is less frequent. The European Commission (2016) estimated the impact of the reforms included in the National Reform Programmes of Italy, France, Spain and Portugal, using the QUEST III R&D model. Among the reforms taken into consideration, the liberalisation of regulated professional services was simulated for Italy, France and Portugal. Two channels of transmission were considered, the mark-up reduction and the labour productivity increase. The Italian reform of professional services was simulated through a decrease in final goods mark-ups by 0.13 pp. and a gradual increase in labour productivity of professional services by 2% over 5 years. The GDP additional increase was estimated at 0.12% after 5 years and at 0.23% on the long run. In France, the impact of professional services reform was presented together with the impact of energy sector reform resulting in a decrease in final goods mark-ups of 0.21 pp. and a gradual increase in labour productivity of 0.03% over 5 years. The impact on GDP growth was estimated to 0.10% after 5 years and to 0.15% on the long run. The Portuguese reform of professional services was translated by a final goods' mark-ups decrease of 0.12 pp. and a gradual increase in labour productivity of 0.3% over 5 years. The additional GDP growth was estimated at 0.25% after 5 years and 0.32% in the long run.

To sum up, the economic impact of a reform depends on the initial level of regulation in professional services, on the scale of the reform and on the relative importance, both direct and indirect, of professional services in the economy.

---

[8]    ETCR means Energy, Transport and Communications Regulation.

# 2. Professional services in Belgium

In the annual report of 2017, the Price Observatory analysed the functioning of the market for legal (NACE M 69.1), accounting (NACE M 69.2), architectural (NACE M 71.11) and engineering services (NACE M 71.12)[9].

This analysis was inspired by the European Commission's study 'The economic impact of professional services liberalisation'[10].

The four services studied here form an important part of the Belgian economy. Together, they generated 3.7% of the total value added of the Belgian economy in 2015. More precisely, the contribution of legal activities to the Belgian economy's total added value amounted to 1.5%, while accounting activities contributed 0.8%, architectural activities 0.4% and engineering activities 1.0%. In addition, in 2015, 4.2% of the total number of people employed in the Belgian economy were working in these four services.

Moreover, the input-output tables for 2010[11] show that these sectors are closely linked to other industries of the Belgian economy, not only as users of inputs from other industries (upstream links), but also as producers of inputs for other industries (downstream links). The graph below shows the intensities of the upstream and downstream links of each industry, normalised so that the averages equal 1. Clearly, the legal and accounting services (69 A[12], red square in the graph) as well as the architectural and engineering services (71 A, green square) lie in the upper right quadrant, meaning that they are linked more strongly than average with both upstream and downstream sectors. The impact of a change caused by a cost or demand shock is therefore much greater than in other industries. In the case of a demand shock, for example, an increase of 1,000 euros in the final demand to Belgian legal and accounting services results in a growth in production of 1,647 euros and in added value of 868 euros in the whole economy.

---

[9]    Institute for National Accounts (2018), 2017 annual report, available on  https://economie.fgov.be/nl/publicaties/prijzen-analyse-van-de-prijzen-22, from page 56 on.

[10]    European Commission, European Economy, September 2014, http://ec.europa.eu/economy_finance/publications/economic_paper/2014/pdf/ecp533_en.pdf.

[11]    2010 is the most recent data available, but the structural links are very stable over time.

[12]    According to the SUT classification from the input and output table.

**Graph 1     Flow chart of measurement deviations of upstream and downstream links for all the branches**



Sources:   Federal Planning Bureau, own calculation.
NB: in red, the sector of legal and accounting services (NACE 69 A). In green, the sector of architectural and engineering services (NACE 71 A)
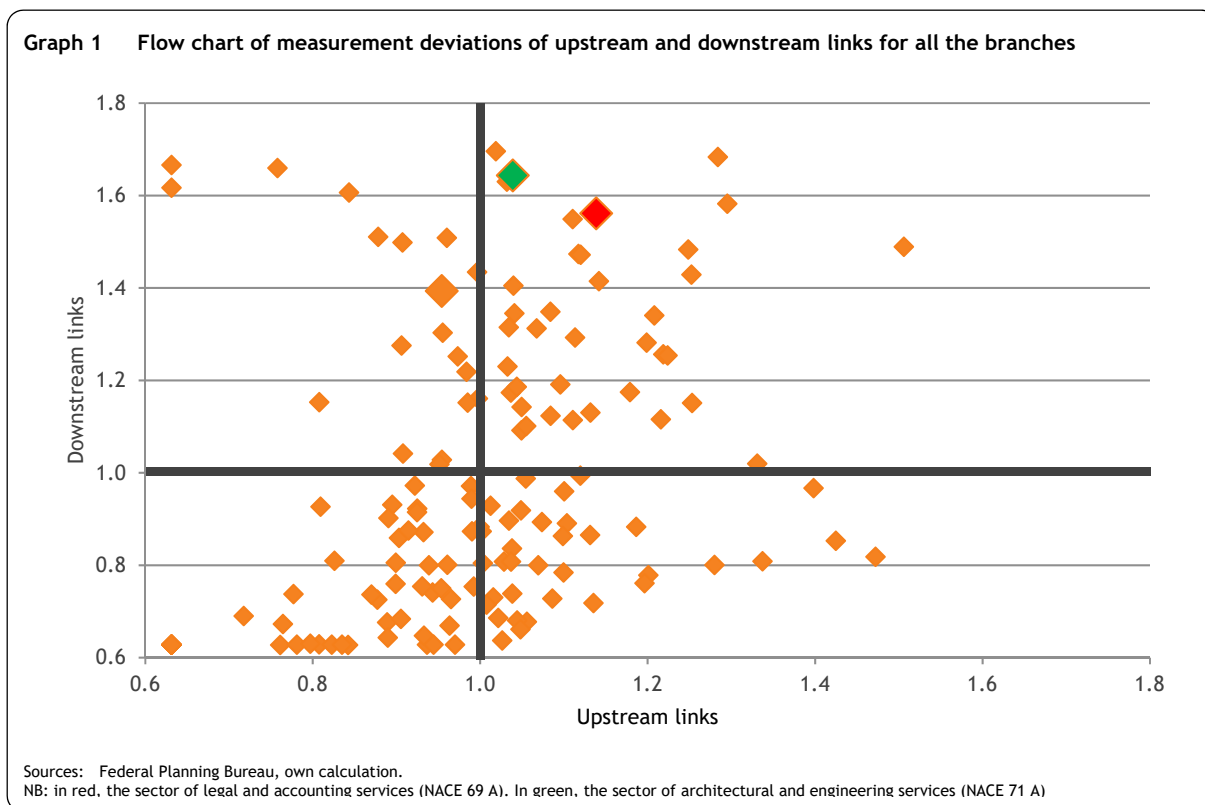
Concerning the functioning of the market in these services, the introductory analysis based on the horizontal screening of Belgian sector[13] carried out each year by the Price Observatory, revealed that the 12 sectors relating to legal, accounting, architectural and engineering services are very heterogeneous in terms of economic importance. The sectors are not very concentrated and, for most of them, the capital intensity is lower than average among service industries. As for operating profitability, the analysed sectors all have a higher than average gross operating margin among service sectors, except for engineers.

**Table 1     List of analysed sectors during the horizontal screening of sectors**

| Legal services (NACE 69.1) | Accounting services (NACE 69.2) | Architectural activities (NACE 71.11) | Engineering activities (NACE 71.12) |
|---|---|---|---|
| • Legal representation<br>• Notaries<br>• Bailiffs<br>• Other legal activities | • Accounting<br>• Bookkeeping<br>• Auditing activities | • Construction architects<br>• Interior architects<br>• Landscape and garden architects | • Engineering and technical consulting<br>• Surveyors |

Source: Federal Public Service Economy.

The degree of regulation for these four professional services can be measured by the Non-Manufacturing Regulation (NMR) indicator from the OECD[14]. This indicator assigns a score from 0 (no regulation)

---

13   Institute for National Accounts (2016), Market Functioning in Belgium: Horizontal Screening of the Sectors.
14   NMR is a sub-category of the Product Market Regulation index (PMR). The degree of regulation can also be measured by the restrictiveness indicator from the European Commission. More information on that matter can be found in the annual report of 2017 from the Price Observatory.

to 6 (most regulated) for several underlying variables concerning on the one hand entry regulation, such as education requirements, exclusive rights and chamber membership, and on the other hand conduct regulation, which includes form of business and interprofessional cooperation. The average of these different scores gives a total score for the professional service.

In 2013, the aggregate value of the NMR for the four professional services was higher in Belgium than in the EU and the neighbouring countries except for Germany that reached approximately the same level. For the legal and accounting services, Belgium reached a higher score than the EU and the neighbouring countries. Yet, it reached a lower score for architects compared to France. Engineering services do not have a specific regulation in Belgium.

**Graph 2    NMR indicator for professional services[1]**
*(from 0 to 6, from the less to the most regulated)*



Source:    OECD, Price Observatory 2017 annual report
NB: 1. The average indicator for the EU concerned 28 EU countries in 2013, 20 EU countries in 2008, 19 EU countries in 2003 and 15 EU countries in 1998.
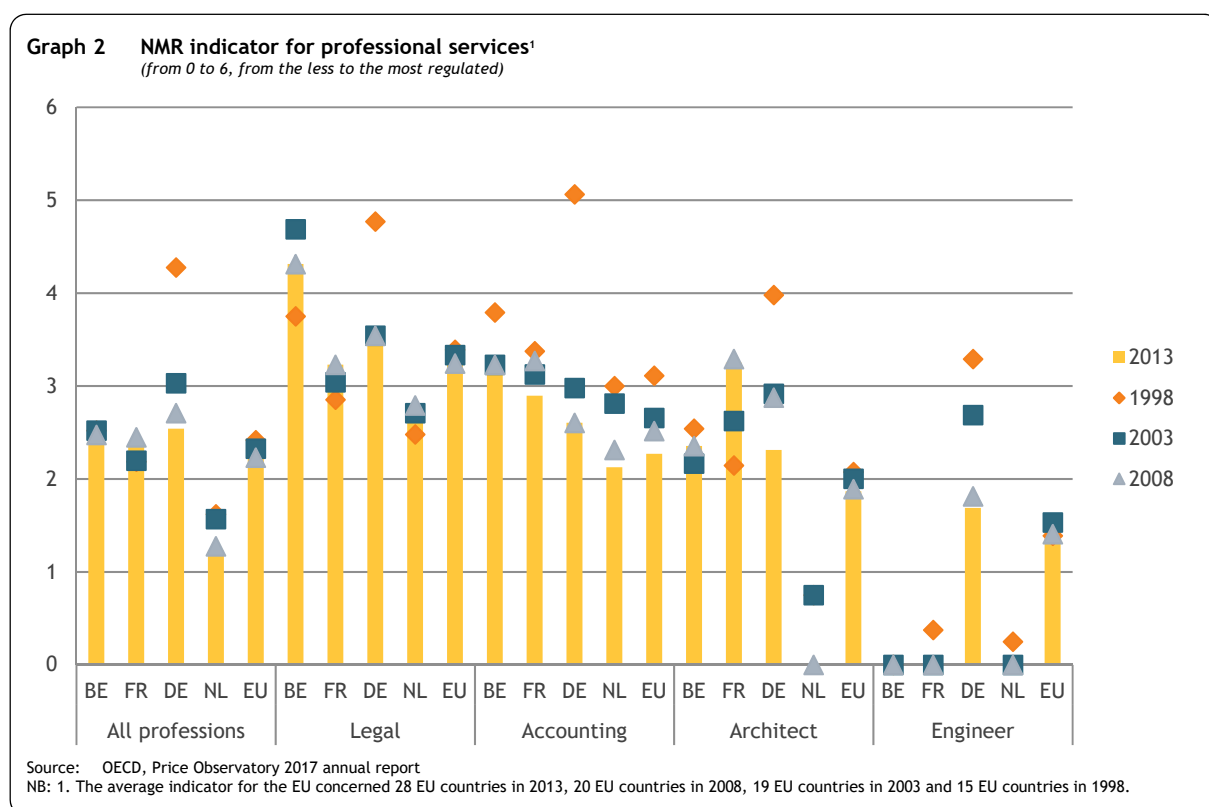
In order to better understand the functioning of these four services and to compare their economic situation in Belgium and in neighbouring countries, the Price Observatory carried out an analysis based on three indicators, namely sector dynamics (measured by the churn rate), allocative efficiency and profitability (measured by gross operating margin)[15] over the 2008-2015 period. This analysis revealed that for the legal and accounting activities in Belgium, the higher level of regulation (i.e. the Belgian NMR being higher than that of our neighbouring countries) coincides with weak dynamics (i.e. the Belgian churn rate being lower than that of neighbouring countries), and with a non-optimal use of resources. Only Germany performs worse in terms of allocative efficiency. The legal and accounting activities in the Netherlands are in the opposite situation compared to Belgium, in that they are characterized by a lower level of regulation, stronger dynamics and a better allocation of resources. It should

---

[15]    The churn rate is defined as the sum of new businesses and of firms that have ceased trading divided by the number of firms operating in a sector. The allocative efficiency (or AE) is defined as the extent to which the most productive factors are allocated in the most efficient way (for calculation, see Olley & Pakes 1996, and Product Market Review 2013 from DG ECFIN). Gross operating margin is defined as the ratio between the gross operating surplus and the turnover.

be noted that, besides their low level of competition, legal activities in Belgium are also characterized by a fairly high profitability (only in Germany there is a higher profitability), while the profitability of this sector in the Netherlands is lower. As for accounting activities, the differences are smaller in terms of profitability. Belgian and Dutch accounting activities indeed seem to generate the same level of profitability, whereas their level of regulation and their market dynamics seem to have opposite characteristics. In France and Germany, regulation in legal and accounting activities is lower than in Belgium while sector dynamics is higher. Concerning the other two characteristics, it seems that only in Germany allocative efficiency is lower than in Belgium and profitability is higher.

For architectural activities, the dynamics of the sector as measured by the churn rate is lower in Belgium than in our neighbouring countries), whereas the level of regulation as measured by the NMR is higher than that of the Netherlands, but less than or equal to that of the other two neighbouring countries. The profitability is rather high, although Germany has the highest profitability, and resource allocation does not seem optimal. The situation of the sector in the Netherlands is the opposite of the one in Belgium, i.e. a lower regulation level, stronger dynamics, lower profitability and better resource allocation. Architectural activities are more regulated in France than in Belgium, but they show stronger dynamics, better resource allocation and lower profitability. While Germany has almost the same level of regulation as in Belgium, the sector dynamics and allocative efficiency are better, and profitability is higher.

As for the engineering activities, there is no specific regulation in Belgium, in France or in the Netherlands.

The Price Observatory has also attempted to link the degree of regulation to the quality of service at a more aggregated level (though only accounting services and legal services could be analysed). This analysis seems to suggest that the link between the two variables is uncertain: a higher degree of regulation does not necessarily go hand in hand with a better quality of service.

# 3. Simulation of market reforms: methodology

## 3.1. Reform scenarios and transmission channels

In this paper, we study the effects of a light and a strong reform of the regulation of professional services. In the light scenario, the reform covers two aspects of the profession conduct regulation: the abolition of the ban on advertising and the removal of the restrictions on company legal form for both accounting and architectural services (see Table 2 for the precise changes in the NMR questionnaire). Indeed, publicity is already framed by rules that apply to all companies. The question therefore arises as to whether specific rules are still necessary only for the intellectual professions. Moreover, the difference between commercial companies and civil companies will eventually disappear as a result of the reform of the Company Code (this reform is currently under discussion in the parliamentary committee).

In the strong scenario, in addition to the measures taken in the light scenario, the reform also considers reducing restrictions on the exercise of other activities in combination with the regulated activity (see annex for the precise changes in NMR questionnaire). Abolishing the prohibition on combining certain other activities with the intellectual profession is a more radical change. It is often argued that combination with other activities poses a risk to the independence of the intellectual professions. However, it is clear that the European Commission wants as few restrictions as possible. The Commission is in favour of a case by case analysis with a posteriori control rather than a priori control. This is why one of the Commission's main concerns is to limit the ban on combining activities.

In the simulations, both scenarios will be augmented with a reform in the legal services of the same magnitude as the average reform of the architecture and accounting professions (see section 3.3.1. for details).

**Table 2  Detailed overview of reform scenarios**

| Item | Question | Answer | | |
|------|----------|--------|---|---|
| | | Pre-reform | Light reform | Strong reform |
| Q8.3.1a_iv | Are public limited companies permitted as the legal form of business in the accountancy profession? | No | Yes | Yes |
| Q8.3.4a_iv | Are public limited companies permitted as the legal form of business in the architecture profession? | No | Yes | Yes |
| Q8.3.9_ACC | Are there restrictions on advertising and marketing by professionals in the accountancy sector? | Restricted | No | No |
| Q8.3.9_ARC | Are there restrictions on advertising and marketing by professionals in the architecture sector? | Restricted | No | No |
| Q8.3.10_ACC | Are there restrictions on inter-professional co-operation (e.g. partnerships, associations, joint ventures) in the accountancy profession? | Cooperation allowed between comparable licensed professionals | Cooperation allowed between comparable licensed professionals | All forms allowed |
| Q8.3.10_ARC | Are there restrictions on inter-professional co-operation (e.g. partnerships, associations, joint ventures) in the architecture profession? | Cooperation allowed between comparable licensed professionals | Cooperation allowed between comparable licensed professionals | All forms allowed |

In the simulation, the effects of these deregulation measures will be calculated. Three transmission channels are taken into account as suggested by the literature. First, a reduction in market regulation is assumed to increase competition (e.g. by increasing the number of market entrants) and thus lower the price-cost mark-up ratio in the sector (cf. Thum-Thysen and Canton, 2015; EC, 2016). A second possible effect is a change in TFP of the sector that is deregulated, though the effect can be a priori both positive and negative. On the one hand, deregulation increases competition and thus makes the allocation of resources within the sector more efficient, thereby increasing productivity (cf. Canton, Ciriaci & Solera, 2014). Additionally, more competition increases the incentives to innovate (cf. Cette, Lopez & Mairesse, 2014). On the other hand, less rents may also lower the financial capacity to innovate (Cette, Lopez & Mairesse, 2014). In practice, most empirical estimates seem to point to positive effects of deregulation on within-sector TFP.

A third channel involves the 'downstream' linkages from professional services to other sectors which use these services as intermediary inputs. E.g. Cette et al. (2014) assume that more market power in an upstream sector may decrease incentives to innovate downstream because the upstream firms have the power to claim a share of the increased productivity as rents.

## 3.2. Model description

For the simulation of the market reforms, we use the model QUEST III R&D, which was developed at the Directorate-General for Economic and Financial Affairs of the European Commission and belongs to the class of dynamic, stochastic, general-equilibrium (DSGE) models. This section motivates the choice for this model by describing the relevant properties of the DSGE framework in general and of QUEST III R&D in particular.

General equilibrium models assume, characteristically, that the economy strives, at least in the long run, towards an equilibrium, in which all prices and wages have adjusted so as to make all markets (product, labour and financial markets) clear. This process of self-adjustment corresponds to what Adam Smith called 'the invisible hand': equilibrium, in an idealised view abstracting from market failures, is attained most efficiently by letting the decentralised information present in the economy (on consumer preferences, production technologies, available resources,…) percolate through unconstrained behaviour into market prices, which in their turn inform the different economic agents involved and may nudge them into altering their behaviour. In this way, a feedback process unfolds that ultimately converges to an equilibrium price vector that aligns the behaviour on all markets.

A second defining property is that DSGE models are based upon micro-foundations: they are derived from structural specifications for all types of economic actors, as well as the channels through which interactions can take place. Concretely, in QUEST III R&D, households are characterised by a preference function which takes private consumption and leisure as arguments. They dynamically optimise their behaviour given prices and wages, and under an income constraint that relates consumption and investment expenditure to labour and capital income, interest on and purchases of domestic and international government bonds, taxes and benefits. To allow for departures from completely anticipatory, intertemporally rational behaviour, a second type of household was included, which is liquidity constrained: it only receives labour income and social benefits and spends this entirely on consumption.

The production side consists of three sectors. The final goods sector operates according to a Cobb-Douglas production function in labour and capital with a fixed production cost. Firms create varieties of the final good that are imperfect substitutes, leading to monopolistic competition and a price over marginal cost mark-up that depends on the elasticity of substitution between products. Productivity growth can take place either in a Hicks neutral way through additional public investment or through an increase in an exogenous TFP variable[16], or in a capital-augmenting way by increasing R&D. The latter channel involves the two other sectors in the economy. The R&D sector transforms R&D labour into 'designs' or patents, which are used to create more varieties (or firms) in the intermediate sector. The latter sector can be thought of as creating the capital good. An increase of the number of varieties in this sector, while keeping effective capital in the final sector constant, will enhance the efficiency (or quality) of the capital used in production.

Government consists of a monetary authority that sets the nominal interest rate in a (lagged) response to the deviation from the inflation target and to the output gap. The fiscal government levies taxes on consumption and production factors, partly exempting some forms of investment, and spends on public consumption, productive public investment and benefits. A lump sum tax rule ensures that a change in policy does not alter the long term public debt rate. The sign of this tax indicates whether a reform is sustainable (-) or not (+). Comparing the lump sum tax adjustment between two reforms can also give an indication of the relative sustainability.

In this exercise, the Belgian version of QUEST III R&D is used, which consists of three regions: Belgium, the rest of the Euro area and the rest of the World. All regions are modelled in the same way, except that Belgium and the rest of the Euro area have a shared monetary authority.

A third important feature is the dynamic set-up of the model. This not only allows for intertemporal optimisation, like forward-looking behaviour and capital accumulation, but also for different types of rigidities through the adding of adjustment costs on e.g. labour, wages and prices.

There are five main reasons why this specific model set-up is adequate to simulate the effects of structural reforms in general as well as the specific market reforms studied in this paper. Firstly, structural reforms often pertain to several markets or have a profound impact that transcends the specific market(s) where they were brought into force. Indeed, price and wage changes result in shifting allocations, and hence even markets not directly targeted by the measures may eventually be affected. General equilibrium models, per definition, take this interwovenness of markets into account.

A second advantage of DSGE models, is that equilibrium is assumed. Models that are estimated in an unconstrained way rather than as a consistent system of equations, may not capture unsustainable incongruences that result from adopting a reform. In contrast, DSGE models need a "pressure valve" variable, the lump sum tax variable in the case of QUEST III R&D, which guarantees that a new equilibrium can be obtained. As described earlier, the evolution and equilibrium value of such a variable indicates whether a reform is fiscally sustainable and allows to compare the relative degree of sustainability of different reforms.

---

[16] In some model versions, this exogenous productivity variable is labour-augmenting. However, given that this study relies on estimated effects on TFP, we use the Hicks-neutral version, cf. infra.

Thirdly, a reform is called 'structural' because it changes fundamental properties of the economy, be it consumer preferences, production technologies, or market functioning. Because DSGE models are explicitly derived as first order equations from such fundamental objective functions and constraints, the model equations are expressed in terms of 'deep' parameters (or exogenous variables) that represent structural characteristics of the behaviour of economic agents and the institutional framework, like price-cost mark-ups, Frisch-labour elasticities, tax rates, etc. With these parameters, a DSGE model contains several channels through which structural reforms can be translated into the model. Of course, one must take care that the specific model used accounts for all the theoretically and empirically relevant transmission channels of the reform under consideration. The next section will elaborate how QUEST III R&D covers all the channels relevant in this exercise.

A fourth reason to use QUEST III R&D in particular, lies in the transition from concrete policy measures to a stylised model. Indeed, it is beyond any economic model to include unique parameters for the myriad of possible policies. Instead, a two-step approach is often followed, in which a translation of a measure into one or more model parameters precedes the actual simulation. In the current context, one could think of the effect that different liberalisation proposals can have on competition and the mark-up in a sector. In order to quantify such an effect, one has to rely on empirical estimates. The existence of empirical studies providing a link between policy measures and QUEST's parameters related to market functioning are an important consideration in the model choice. Finally, the existence of a Belgian version of the model allows the simulation to be tailored to the specific policy context, all the while respecting Belgium's status as a small open economy in the Euro area.

This said, a number of caveats are in order when interpreting the simulation results. Firstly, the fact that DSGE models are built on structural equations of agents' behaviour, as discussed earlier, means that they are sensitive to misspecifications with respect to objective functions and market functioning. There are legitimate concerns about these models not taking into account empirically observed deviations from full rationality and market frictions, while the existence of heterogeneity among economic agents may not only be not sufficiently accounted for, but even threaten the mathematical underpinning of the framework itself (e.g. the properties of aggregate demand and supply curves which are necessary to guarantee existence and uniqueness of equilibrium). While some steps have been taken in the last two decades to include real and nominal frictions into the model and to introduce elements of bounded rationality and heterogeneity, it remains vital to compare simulation results with results from other models and empirical research whenever possible.

Secondly, DSGE models are solved as systems of nonlinear difference equations, which involves great computational complexity when the model is large. Therefore, they offer a very stylised description of the economic system, with important 'details' sacrificed in order to be able to get a solution. This leads to e.g. a coarse breakdown of industry branches with corresponding input-output structure (more often than not limited to one final sector), the modelling of the tax system by a few implicit tax rates, or a stylised representation of the wage formation process. For this reason, we believe that the use of this type of models in simulating policy measures by the fiscal and legal authority is most appropriate for reforms of a structural nature. The transition path to the new equilibrium should, in this view, be interpreted as a 'trend' path rather than an actual prediction.

## 3.3. Translation of scenarios into model shocks

As described earlier, a liberalisation of the regulated professions is assumed to affect the economy through three channels: (1) the decrease in market power will lower the mark-up of price over marginal cost in the regulated professional services, (2) the increase in competition will likely have a positive impact on the total factor productivity of these services, and (3) the total factor productivity in downstream sectors will increase because the incentives to innovate are expected to rise when regulated professions have less power to claim part of the rents and because less regulation upstream may enhance access to downstream sectors. For the first channel, the final sector mark-up in QUEST III R&D is the logical parameter through which to introduce the policy shock, while for the two other channels the model's final sector TFP seems the appropriate choice. A first step common to all channels, however, is to aggregate concrete market reform measures in one policy indicator. Here, the OECD's Non-Manufacturing Regulation Indicator (NMR) is the obvious choice, since it integrates detailed information about market regulation, while at the same time empirical research exists linking the indicator to both the mark-up and TFP.

The section starts with a closer look at the NMR indicator, the update of this indicator that was carried out in the context of the study and the implementation of the reform scenarios.

### 3.3.1. Non-Manufacturing Regulation indicator (NMR)

There are actually separate NMR indicators for three different sectors, to wit network services (including energy, transport and communications), professional services and retail trade. The first two are split up into sub-indicators according to more narrowly defined sectors. The NMR for professional services, which is relevant for this study, has sub-indicators for legal services, accountants, architects and engineers. The composite indicator for professional services is, rather strangely, calculated as the simple average of the four sub-indicators, so it does not take the relative importance of the four sub-sectors into account.

In the current exercise, the pre-reform value and the different post-reforms values of the NMR refer to the aggregate over all professional services, because only the aggregate NMR is used as an explanatory variable in the regressions linking the NMR with prices / mark-ups and TFP. So even if a reform only affects the accounting sector, the estimated coefficient can only validly be applied to the aggregate NMR. The corresponding change in price / mark-up or TFP also applies to the entire sector of professional services, not only to the accounting sector.

The calculation of the pre-reform value of the NMR started with the last officially published NMR for Belgium in 2013. There has been no reform in the four professional services since 2013. However, some answers have been updated or corrected. They mainly cover the exclusive right to perform some specific activities and the legal form business restrictions. The updated answers are presented in Table 5 in annex. A new NMR was calculated changing the item scores corresponding to these reforms. The pre-reform value amounts to 2.63 compared to the 2013 value of 2.47.

As for the post-reform values, the 'light' reform of accounting and architectural services was calculated by assuming a lift of all regulations on advertising, marketing and legal business forms (i.e. allowing

public limited companies), as well as the average of these two decreases in NMR applied to the legal services, leading to a post-reform value of 2.16 (-0.47). The 'strong' reform moreover includes the lifting of all restrictions on inter-professional cooperation in the accounting and architectural professions, while again the NMR for judicial services is assumed to decrease by the average amount. Taken together, this lowers the aggregate NMR value to 1.74 (-0.89).

The magnitude of these reforms seems realistic in a European context. E.g. in EC (2016), the Italian liberalisation package of 2012 which included the abolition of minimum, maximum and recommended tariffs in regulated professions, as well as the removal of entrance barriers for young people, was calculated to have an effect of -0.49 on the NMR of professional services. The same document reports a combined effect of -0.31 for a 2014 reform of the accounting profession and the 2015 Macron Law which included a liberalisation of legal professions, but these reforms include only two professions. A 2013 reform of regulated professions in Portugal was estimated to lower the NMR by only -0.1, but this figure partly reflects an actual rise in regulations for engineers. Moreover, the value of the NMR index after the light reform scenario (2.16) brings back the Belgian index close to the 2013 average value for EU28[17] index (2.17), still above the average value of the index for the three main neighbouring countries (2.04) and far from the average value of the three best performers, Sweden, Finland and Denmark (0.66).

### 3.3.2. Final sector mark-up

The model's final sector mark-up (MUP) is based on the exogenous variable $\tau$, whose exact interpretation is $\tau = 1 - \frac{1}{MUP}$, corresponding to the regression coefficient $B$ in Roeger (1995). Note that we follow here the definition of the mark-up that is also used in Roeger (1995), i.e. $MUP = \frac{P}{MC}$ is the ratio of price over marginal cost. In the context of this study, the model's pre-reform value for $\tau$ was recalculated on the basis of the latest available sectoral data in EU-KLEMS (1996-2015) for Belgium. The estimation proceeded along the lines of Roeger's method, closely following the study by Christopoulou and Vermeulen (2008), e.g. by using the same user cost of capital concept to construct an ex ante measure of capital compensation. The overall mark-up was calculated as an average of the mark-ups of those sectors that belong to the final sector in Quest III R&D, weighted by their respective shares in gross output in 2015.

To calculate the shock in this variable resulting from the reform, we use the results by Thum-Thysen and Canton (2015), who estimate that an increase in the NMR for professional services raises the sector's 'mark-up' by 0.0511. Note that their definition of the mark-up equals Roeger's B coefficient, or the $\tau$ variable in QUEST, which is related to our mark-up concept MUP as: $B = \tau = 1 - \frac{1}{MUP} = (P - MC)/P$. The change in $\tau$ is then calculated as the change in NMR times the coefficient estimated by Thum-Thysen and Canton, weighed by the share of total output in the final sector produced by the professional services.

While the mark-up in the model's final sector is 1.2462 in the pre-reform equilibrium, it decreases to a value of 1.2454 under the light reform scenario and of 1.2446 under the strong reform scenario.

---

[17]    In fact, EU26 because no NMR index is available for Bulgaria and Romania.

### 3.3.3. TFP

The final sector's production function in the Belgian 2016 version of QUEST III R&D takes the form:

$$Y_t = \left( PAT_t^{\frac{1}{\theta_{RD}}-1} UCAP_t K_t \right)^{1-\alpha} \left( a_t \left( LCES_t - fcl_t \right) \right)^{\alpha} KG_t^{1-\alpha_G} - a_t fcy_t$$

where $Y_t$ represents output, $PAT_t^{\frac{1}{\theta_{RD}}-1}$ a capital-augmenting productivity based on R&D, $UCAP_t$ capital utilisation and $K_t$ the physical capital stock, $LCES_t$ and $fcl_t$ the final sector labour aggregate and the overhead labour cost respectively, $KG_t$ the public capital stock and $fcy_t$ a fixed production cost. As for the constants, $\alpha$ symbolises the labour share of income, $1 - \alpha_G$ the output elasticity of public capital and $\theta_{RD}$ the inverse mark-up in the (capital goods producing) intermediate sector. $a_t$ is an exogenous variable that is 1 in the initial steady state and represents a technological factor that is labour-augmenting or Harrod-neutral, as apparent in the formula. To remain consistent with the usual definition of TFP and the empirical results which are used in this exercise and are discussed below, $a_t$ is moved out of the brackets in the model (and deleted from the fixed cost term) and thus appears in the production function in a Hicks-neutral way:

$$Y_t = a_t \left( PAT_t^{\frac{1}{\theta_{RD}}-1} UCAP_t K_t \right)^{1-\alpha} \left( LCES_t - fcl_t \right)^{\alpha} KG_t^{1-\alpha_G} - fcy_t$$

As a consequence, $a_t$ can be interpreted as a Hicks-neutral TFP variable through which the productivity shocks can be introduced.

To translate the shock to the NMR into a shock to TFP, we make use of the results from Cette, Lopez and Mairesse (2014, 2016), who estimate the impact of a change in the (log) price in one sector on the TFP of both the sector itself (i.e. the direct effect) and other sectors (i.e. the indirect effect). In their specification that differentiates between manufacturing and non-manufacturing industries, they find that the effect on $tfp_i = \log(TFP_i)$ in a non-manufacturing sector $i$ caused by a change in sector $i$'s own log price $p_i = \log(P_i)$ is:

$$\frac{\partial tfp_i}{\partial p_i} = -0.827$$

At the same time, another sector $j$'s $tfp_j = \log(TFP_j)$ is affected by a composite price index $P_j^{INM}$ of all non-manufacturing industries that supply intermediate goods to sector $j$:

$$\frac{\partial tfp_j}{\partial P_j^{INM}} = -5.060$$

where the price index $P_j^{INM}$ is just the sum of log prices of all non-manufacturing industries, weighted by the intensity-of-use of intermediate inputs $use_j^k$, defined as the intermediate consumption by sector $j$ of non-manufacturing industry $k$'s products as a fraction of sector $j$'s gross output. Hence, the effect of a change of (non-manufacturing) sector $i$'s log price on sector $j$'s log TFP can be expressed as:

$$\frac{\partial tfp_j}{\partial p_i} = -5.060 \, use_j^i = -5.060 \frac{I_j^i}{Y_j}$$

where $I_j^i$ is intermediate consumption by sector $j$ of sector $i$'s products and $Y_j$ is sector $j$'s production.

In order to use these results, we have to make a connection between the change in NMR and the change in log price. Because of the results of Thum-Thysen and Canton (2015), the link between a change in sector $i$'s $NMR_i$ and the change in its $\tau_i$ has already been established:

$$\Delta \tau_i = 0.0511 \, \Delta NMR_i$$

The only thing left to do, is to find a connection between $\Delta \tau_i$ and $\Delta p_i$. For this, expressing pre-reform values with subscript 0 and post-reform values with subscript 1, it is easy to see that:

$$\Delta \tau_i = \tau_{i1} - \tau_{i0} = \left(1 - \frac{MC_{i1}}{P_{i1}}\right) - \left(1 - \frac{MC_{i0}}{P_{i0}}\right) = \frac{MC_{i0}}{P_{i0}} \left(1 - \frac{P_{i0}}{P_{i1}}\right) = \frac{1}{MUP_{i0}} \left(1 - \frac{P_{i0}}{P_{i1}}\right)$$

where $MC_i$ denotes marginal cost as before, and it was used that sector $i$'s marginal cost is the same pre- and post-reform. The difference in log price is thus given by:

$$\Delta p_i = -\log(1 - \Delta \tau_i \, MUP_{i0})$$

Note that the initial MUP for professional services is available to us, as it was estimated to obtain the overall mark-up (cf. supra). However, since the disaggregation in EU-KLEMS is not that fine, we had to use the MUP for 'professional, scientific, technical, administrative and support service activities', which amounts to 1.27.

The effect on total log TFP can then be aggregated by summing over all sectors included in QUEST's final sector, weighted by their share in gross output. This yields:

$$\Delta \, tfp = \frac{Y_i}{Y} \frac{\partial tfp_i}{\partial p_i} \left(-\log(1 - 0.0511 \, \Delta NMR_i \, MUP_{i0})\right) + \sum_{j \neq i} \frac{Y_j}{Y} \frac{\partial tfp_j}{\partial P_j^{INM}} \left(-\log(1 - 0.0511 \, \Delta NMR_i \, MUP_{i0})\right)$$

And, plugging in the estimations for $\frac{\partial tfp_i}{\partial p_i}$ and $\frac{\partial tfp_j}{\partial P_j^{INM}}$:

$$\Delta \, tfp = \frac{Y_i}{Y} \, (-0.827) \left(-\log(1 - 0.0511 \, \Delta NMR_i \, MUP_{i0})\right)$$
$$+ \frac{\sum_{j \neq i} I_j^i}{Y} \, (-5.060)\left(-\log(1 - 0.0511 \, \Delta NMR_i \, MUP_{i0})\right)$$

The shock given to the model variable $A$ is the exponent of the last expression. This amounts to a post-reform TFP of 1.0010 under the light reform scenario and 1.0020 under the strong reform scenario (while the pre-reform TFP was normalized to be 1).

# 4. Results

The effects of the light reform are presented in Table 3. The economy gets a boost in the first year, increasing GDP by 0.10%, an effect which increases over the years until reaching 0.21% in the long run. As for the components of demand, private consumption and investment increase by more or less the same amount. Consumption reacts somewhat faster because of forward-looking behaviour from the part of the households and of investment adjustment costs. The export position of Belgium improves, mainly as a result of a decrease in the domestic deflator due to the lower mark-up of the professional services and an economy-wide rise in productivity, which is shown here by the evolution of labour productivity. Because of the latter, and the ensuing increase in the real wage, the employment rate also increases slightly.

**Table 3    Effects of light market reform of regulated professions**
*Evolution in % deviation from baseline, except when mentioned otherwise*

|  | 1 year | 3 years | 5 years | 10 years | 20 years |
|---|---|---|---|---|---|
| GDP | 0.10 | 0.15 | 0.16 | 0.18 | 0.21 |
| Private consumption | 0.06 | 0.13 | 0.15 | 0.17 | 0.18 |
| Private investment | 0.04 | 0.12 | 0.14 | 0.15 | 0.17 |
| Exports | 0.06 | 0.09 | 0.09 | 0.10 | 0.12 |
| Imports | -0.02 | 0.00 | 0.02 | 0.02 | 0.01 |
| Domestic deflator (indexed) | -0.06 | -0.08 | -0.08 | -0.09 | -0.11 |
| Real gross wage | 0.07 | 0.14 | 0.16 | 0.17 | 0.19 |
| Labour productivity | 0.11 | 0.12 | 0.13 | 0.15 | 0.17 |
| Employment rate (percentage point deviation) | -0.01 | 0.02 | 0.02 | 0.02 | 0.02 |

The effects of the strong market reform are shown in Table 4. They paint the same picture, with all values more or less doubled. Decomposition of these results with respect to the transmission channel, show that the decrease of the mark-up accounts for 20% of the GDP effect, the direct TFP effect for 25% and the indirect, downstream effect for the remaining 55%. In both scenarios, the effects materialise relatively quickly: for all variables, half of the long-term change takes place in the medium term.

**Table 4    Effects of strong market reform of regulated professions**
*Evolution in % deviation from baseline, except when mentioned otherwise*

|  | 1 year | 3 years | 5 years | 10 years | 20 years |
|---|---|---|---|---|---|
| GDP | 0.18 | 0.29 | 0.31 | 0.34 | 0.39 |
| Private consumption | 0.11 | 0.25 | 0.29 | 0.32 | 0.34 |
| Private investment | 0.08 | 0.23 | 0.27 | 0.29 | 0.32 |
| Exports | 0.12 | 0.17 | 0.17 | 0.19 | 0.23 |
| Imports | -0.03 | 0.00 | 0.03 | 0.04 | 0.02 |
| Domestic deflator (indexed) | -0.11 | -0.15 | -0.15 | -0.17 | -0.20 |
| Real gross wage | 0.13 | 0.26 | 0.29 | 0.33 | 0.36 |
| Labour productivity | 0.20 | 0.23 | 0.25 | 0.28 | 0.33 |
| Employment rate (percentage point deviation) | -0.01 | 0.04 | 0.04 | 0.04 | 0.05 |

There is another positive effect of the reforms. Because the public debt in percentage of GDP in the model is constrained to return to its initial value, the debt-correcting lump sum tax which serves as a 'pressure valve' in the model (cf. supra) becomes negative, meaning that households get a transfer from the government. Though this 'tax rule' in the model is of a rather technical nature (ensuring model convergence) and makes rather stringent assumptions on the debt-related behaviour of the fiscal government, it is possible to express the transfer in terms of a constant percentage of nominal GDP under

one rather mild assumption[18]. The light reform would result in a perpetual transfer to households of 0.046% of nominal GDP, while a strong reform would create a transfer of 0.087%. Another way of looking at this, is to switch off the debt-correcting tax for a period of time and look at what would happen to the public debt ratio. Graph 3 shows the drop in the debt in percentage of GDP for both reforms when switching off the tax rule for 25 years. Under the light reform scenario, the public debt would drop by 2pp of GDP, while under the strong reform scenario, it would drop by almost 4pp.

**Graph 3**     **Change in public debt rate under light and strong market reform scenarios**
*ppt of GDP*



---
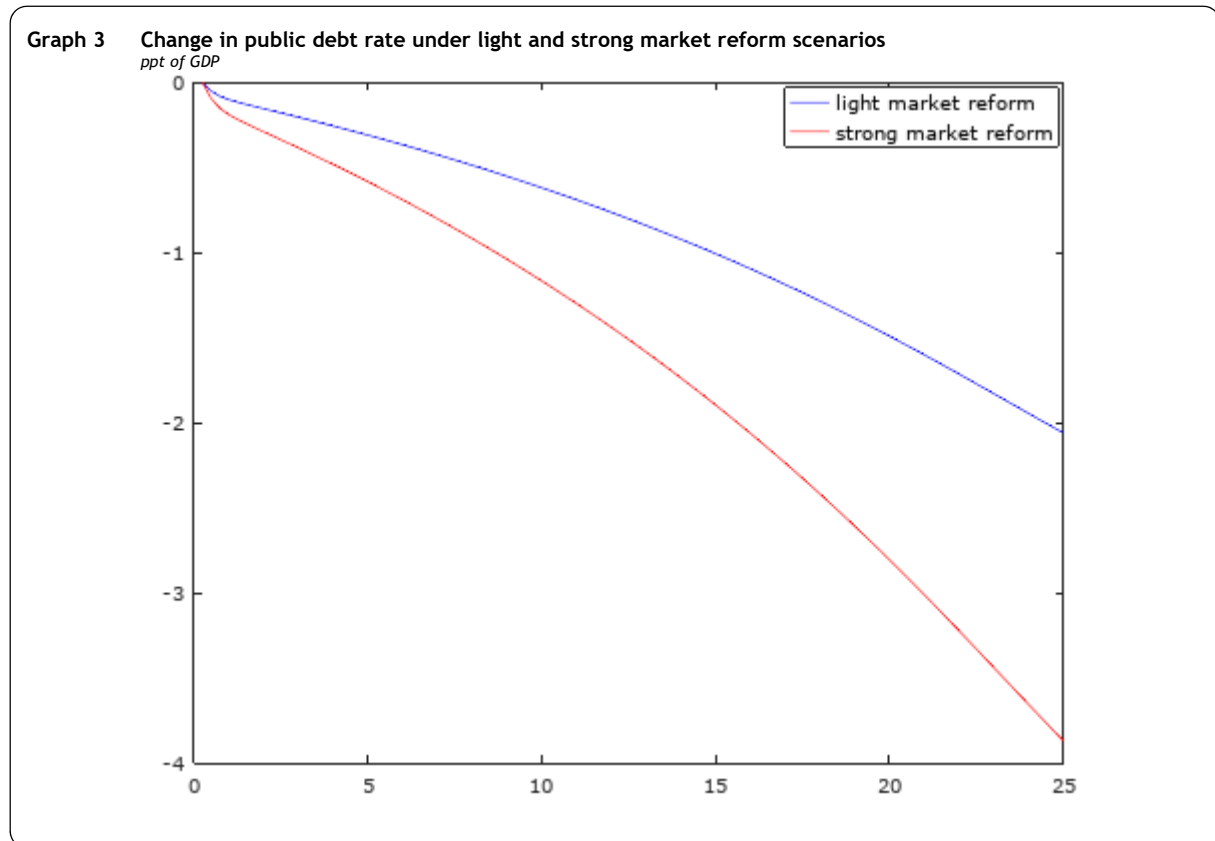
[18]    The assumption being that the change in the spread of the transfers to the households over time does not affect consumer behaviour. Since private consumption expenditure is in the order of 53% of nominal GDP while the transfer remains lower than 0.1%, this seems to be justifiable.

# 5. Conclusion

The legal, accounting, architectural and engineering services, which all belong to the regulated professional services, are economically important not only as providers of final demand but also as providers of intermediary consumption to the other industries. According to the OECD NMR index for professional services, the level of regulation in Belgium is particularly high for legal services, accounting activities and, to a lesser extent, for architectural activities. Moreover, in July 2017, the Council of the European Union recommended that Belgium take action to "increase competition in professional services markets and retail, and, enhance market mechanisms in network industries" as part of the third country specific recommendation.

This paper investigates the potential economic impact on the Belgian economy of reforms in these regulated professional services, using the European Commission's QUEST III R&D model. It is found that a limited reform of these activities may already increase GDP by 0.15% after 3 year, culminating in a 0.21% rise after 20 years. A more ambitious reform, reducing the degree of regulation in Belgium to a level below the EU average but still considerably higher than the EU's three least regulated countries (Denmark, Finland and Sweden), would increase GDP by 0.29% in the third year and 0.39% after 20 years. Moreover, as these reforms are fiscally neutral and boost GDP growth, they create room for fiscal manoeuvre, which could be used to decrease taxes or the public debt ratio.

These results are in line with those found by the Commission for other European countries which have implemented reforms of their professional services (Italy, France and Portugal). However, they should be considered as orders of magnitude rather than a precise quantification of the effects given the inherent limitations of any economic model. Moreover, the approach synthesizing policy measures into indicators has its shortcomings too. On the one hand, some promising policies may not be included in the indicator or may not receive enough weight. On the other hand, the economic effects estimated on these indicators may be based only on a subset of important policy measures, wrongly attributing the same size of effects to the other measures included in the indicator.

# References

Akerlof, G. (1970), "The Market for Lemons: Quality Uncertainty and the Market Mechanism", *Quarterly Journal of Economics* (84): 488 -500.

Barone, G. and F. Cingano (2011), "Service regulation and growth: evidence from OECD countries", The Economic Journal, 121(555), pp. 931-957.

Bourlès, R., Cette, G., Lopez, J., Mairesse, J. and Nicoletti, G. (2013), "Do Product Market Regulations in upstream Sectors curb Productivity Growth? Panel Data Evidence for OECD Countries", *The Review of Economics and Statistics*, 95(5), pp. 1750-1768.

Bouis, R. and R. Duval (2011), "Raising Potential Growth After the Crisis: A Quantitative Assessment of the Potential Gains from Various Structural Reforms in the OECD Area and Beyond", *OECD Economics Department Working Papers*, No. 835, OECD Publishing, Paris.

Canton, E., Ciriaci, D. and Solera, I. (2014), "The Economic Impact of Professional Services Liberalisation", *Economic Papers* 533, September, European Commission, Brussels.

Cette G., Lopez, J. and Mairesse, J. (2014), "Product and Labor Market Regulations, Production Prices, Wages and Productivity", *NBER Working Paper* 20563.

Cette G., Lopez, J. and Mairesse, J. (2016), "Market Regulations, Prices and Productivity", *American Economic Review: papers & proceedings*, 106(5), pp. 104-108.

Cette G., J. Lopez and J. Mairesse (2017), "Upstream product market regulations, ICT, R&D and Productivity", *The Review of Income and Wealth*, vol. 63(1), p. S68-S89.

Cette G., J. Lopez and J. Mairesse (2018), "Rent Creation and Sharing: New Measures and Impacts on TFP", *NBER Working Paper* 24426, March.

Christopoulou, R. and Vermeulen, P. (2008), "Markups in the Euro Area and the US over the period 1981-2004: a comparison of 50 sectors", *Working Paper Series* 856, European Central Bank, Frankfurt am Main.

Égert, B. and P. Gal (2017), "The quantification of structural reforms in OECD countries: A new framework", *OECD Economics Department Working Papers*, No. 1354, OECD Publishing, Paris.

ElFayoumi, K., A. Ndoye, S. Nadeem and G. Auclair (2018), "Structural Reforms and Labor Reallocation A Cross-Country Analysis", *IMF Working Paper* 18/64, March, Washington D.C.

European Commission (2013), "Product Market Review 2013: Financing the real economy", *European Economy* 8/2013, Brussels.

European Commission (2015), "A Single Market Strategy for Europe- Analysis and Evidence", *Staff Working Document* 202, Brussels.

European Commission (2016), "The Economic Impact of Selected Reform Measures in Italy, France, Spain and Portugal", *Institutional Paper* 023, April, Brussels.

European Commission (2017), "Services Markets", European Semester Thematic Factsheet, 22 November, Brussels.

European Parliament and the Council (2013), Directive 2013/55/EU amending Directive 2005/36/EC on the recognition of professional qualifications and Regulation (EU) No 1024/2012 on administrative cooperation through the Internal Market Information System ('the IMI Regulation'), 20 November 2013, Brussels.

European Parliament and the Council (2005), Directive 2005/36/EU on the recognition of professional qualifications, 7 September 2005, Brussels.

Hall, R.E. (1988), "The Relation between Price and Marginal Cost in U.S. Industry", *Journal of Political Economy* 96(5), pp. 921-947.

INR (2016), Marktwerking in België: horizontale screening van marktsectoren.

INR (2017), Analyse van de prijzen: jaarverslag 2017, pp. 56 – 103.

Monteagudo, J., A. Rutkowski and D. Lorenzati (2012), "The economic impact of the services Directive: a first assessment following implementation", *Economic papers* 456, June, European Commission, Brussels.

Roeger, W. (1995), "Can Imperfect Competition Explain the Difference between Primal and Dual Productivity Measures? Estimates for U.S. Manufacturing", *Journal of Political Economy* 103(2), pp. 316-330.

Thum-Thysen, A. and Canton, E. (2015), "Estimation of service sector mark-ups determined by structural reform indicators", *Economic Papers* 547, April, European Commission, Brussels.

Thum-Thysen, A. and Canton, E. (2017), "Estimating Mark-ups and the Effect of Product Market Regulations in Selected Professional Services Sectors: A Firm-level Analysis", *Discussion Paper* 046, May, European Commission, Brussels.

Vargas, J. and J. in't Veld, (2014), "The potential growth impact of structural reforms in the EU A benchmark exercise", *European Economy Economic Paper* 541, December, European Commission, Brussels.

World Bank (2016), "Growth, jobs and integration: Services to the rescue", World Bank EU Regular Economic Report, Washington D.C.

# Annex: Overview of updated NMR items

**Table 5    Detailed overview of updated NRM items (pre-reform)**

| Item | Question | NMR 2013 | Update |
|---|---|---|---|
| Q8.1.1_2 | Does the accountancy profession have a (shared) exclusive right to perform non-statutory audits? | Exclusive right | Shared exclusive rights |
| Q8.1.1_5 | Does the accountancy profession have a (shared) exclusive right on accounting (including public-sector accounting and book-keeping)? | Exclusive right | Shared exclusive rights |
| Q8.1.1_12 | Does the accountancy profession have a (shared) exclusive right to act as expert witness in accounting? | No special right | Shared exclusive rights |
| Q8.1.4_1 | Does the architecture profession have a (shared) exclusive right to perform feasibility studies? | No special right | Exclusive right |
| Q8.3.10_ARC | Are there restrictions on inter-professional co-operation (e.g. partnerships, associations, joint ventures) in the architecture profession? | Most forms of co-operation allowed | Cooperation allowed between comparable licensed professionals |
| Q8.3.4 | Is the legal form of business restricted in the architecture profession? | No | Yes |
| Q8.3.4a_i | Are sole proprietorships permitted? | Not applicable | Permitted |
| Q8.3.4a_ii | Are companies with limited liability permitted? | Not applicable | Permitted |
| Q8.3.4a_iii | Are private companies permitted? | Not applicable | Permitted |
| Q8.3.4a_iv | Are public limited companies permitted? | Not applicable | Not permitted |