# Modernising regulated professions

## Economic importance and impact

Client: Ministerie van Economische Zaken, Directie Europa

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Client: Ministerie van Economische Zaken, Directie Europa

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# Samenvatting (in Dutch)

## Doel van het rapport

Recent is op Europees niveau voorgesteld om een modernisering van de regelgeving van gereglementeerde beroepen[1] uit te voeren. Volgens de herziene richtlijn erkenning beroepskwalificaties[2] zijn alle Lidstaten verplicht om wettelijke bepalingen rondom de toegang tot gereglementeerde beroepen en de daarbij behorende beroepstitels te evalueren.

Nederland streeft naar een ambitieuze aanpak van deze evaluatie en wil hiermee een voorbeeld zijn voor andere EU-lidstaten. Met het oog op deze evaluatie heeft het Nederlandse ministerie van Economische Zaken (EZ) een project plan opgesteld voor de periode november 2013 tot maart 2016. De eerste stappen van dit plan omvatten: (i) het uitvoeren van een inventarisatie van de bestaande gereglementeerde beroepen en (ii) het uitvoeren van een economisch onderzoek naar de mogelijkheden en het economisch potentieel van een modernisering van de regelgeving van gereglementeerde beroepen in Nederland.

Het doel van dit rapport is om inzicht te geven in het economisch potentieel van een modernisering van de regelgeving van gereglementeerde beroepen in Nederland.

De volgende hoofdvragen worden beantwoord:

1. Welk percentage van de Nederlandse economie wordt gedekt door gereglementeerde beroepen?
2. Bij welke gereglementeerde beroepen kunnen de grootste positieve economische effecten worden bereikt door modernisering?
3. Wat is het verwachte economisch effect van een modernisering van gereglementeerde beroepen voor de Nederlandse economie in de komende 10 jaar?

## Resultaten

Het ministerie van Economische Zaken heeft bij de start van dit onderzoekstraject **167 gereglementeerde beroepen** in Nederland geïdentificeerd. Deze lijst met gereglementeerde beroepen wordt nog geëvalueerd in het kader van de wederzijdse evaluatie. De Nederlandse economie heeft 27 sectoren waarin gereglementeerde beroepen vertegenwoordigd zijn. Het aantal gereglementeerde beroepen verschilt sterk per sector. De sector **gezondheidszorg en sociale dienstverlening** (denk aan kinderopvang) staat bovenaan met 73 gereglementeerde beroepen uit een totaal van 167. Ook de sectoren **zakelijke dienstverlening,** en **landbouw, bosbouw en mijnbouw** kennen een relatief groot aantal gereglementeerde beroepen.

Voorzover ons bekend heeft voor de Nederlandse economie nog niet eerder een analyse plaatsgevonden van het aantal personen werkzaam in gereglementeerde beroepen en de impact van deze beroepen op de Nederlandse economie. Wij hebben daarom een methodologie ontwikkeld om een inschatting te kunnen maken van het economisch belang van gereglementeerde beroepen in Nederland. Rekening houdend met het verkennende karakter van dit onderzoek concluderen wij dat de gereglementeerde beroepen tussen de **9,5% en 15,6%** uitmaken van de

[1] Richtlijn 2006/123/EG van het Europees Parlement en de Raad van 12 december 2006 betreffende diensten op de interne markt.

[2] Richtlijn 2005/36/EG van het Europees Parlement en de Raad van 7 september 2005 betreffende de erkenning van beroepskwalificaties als gewijzigd door richtlijn 2013/55/EU.

totale werkgelegenheid. De onderkant van deze bandbreedte is naar onze mening het meest realistisch; de bovenkant van de bandbreedte is waarschijnlijk een overschatting. De gereglementeerde beroepen beslaan zo'n **8,8% tot 15,4%** van de totale toegevoegde waarde in de economie, met inbegrip van de indirecte effecten op gebruikers van deze diensten. Bij deze indirecte effecten gaat om de impact die deze sectoren als toeleverancier hebben op de rest van de economie. Wanneer we naar de omvang van de indirecte effecten in Nederland kijken, zien we dat deze het grootst zijn voor de gereglementeerde beroepen in de sectoren gezondheidszorg en sociale dienstverlening, zakelijke dienstverlening, landbouw, bosbouw, mijnbouw en de bouw[3].

Wanneer we kijken naar het economisch belang van de gereglementeerde beroepen dan concluderen wij dat de gereglementeerde beroepen het grootste aandeel in de toegevoegde waarde hebben in de sectoren gezondheidszorg en sociale dienstverlening en de onderwijssector. Ook in de zakelijke dienstverlening leveren de gregelementeerde beroepen een relatief grote bijdrage. Gegeven het economisch belang van gereglementeerde beroepen in deze sectoren is het interessant om – als een volgende stap - na te gaan waar hervormingen kunnen of moeten plaatsvinden. We merken hierbij op dat verschillende criteria gebruikt kunnen worden om sectoren te selecteren waar hervormingen de meeste kansen voor de Nederlandse economie bieden. De omvang en het huidige economisch belang van gereglementeerde beroepen in een sector is slechts één mogelijk criterium. Nader onderzoek naar de wijze van reglementering en de mogelijkheden voor hervorming per sector is nodig om tot sectorspecifieke beleidsaanbevelingen te kunnen komen.

Een onderzoek naar beschikbare literatuur op dit gebied wijst uit dat er geen literatuur is die de economische effecten bestudeert van een hervorming van de regelgeving voor gereglementeerde beroepen. Hierdoor is het niet mogelijk om de verwachte effecten van de hervorming van Nederlandse gereglementeerde beroepen te schatten op basis van eerdere literatuur. Daarentegen is er wel veel literatuur over de economische effecten van hervormingen in de dienstensector. Gezien het feit dat gereglementeerde beroepen ook diensten zijn, zien wij de onderzoeksresultaten uit deze literatuur als de meest relevante indicaties.

De beschikbare literatuur over hervormingen van de dienstensector laat zien dat er een positieve relatie is tussen hervormingen van de regelgeving en de groei van het Bruto Binnenlands Product (BBP). De meeste literatuur over hervorming van de regelgeving in de Nederlandse dienstensector verwacht een toename van het Nederlandse BBP van **0,2-1,4%** als gevolg van deze beleidsaanpassingen. Literatuur die de effecten voor de EU als geheel analyseert vindt een effect van tussen de **0,5%** en **1,5%** van het EU BBP. Gezien het feit dat de in deze literatuur geanalyseerde hervormingen van de dienstensector een breder spectrum beslaan dan alleen gereglementeerde beroepen, is het niet mogelijk om deze resultaten als graadmeter te zien van de effecten van een modernisering van gereglementeerde beroepen. De gerapporteerde effecten vormen wel een indicatie dat de verwachte effecten positief en significant kunnen zijn.

Om toch een illustratief beeld te geven van de mogelijke omvang van de economische effecten in Nederland, nemen wij aan dat de ondergrens van de bovenstaande inschattingen (die betrekking hebben op de dienstensector als geheel) een relevant vertrekpunt zijn. Tevens rekening houdend met het aandeel van de gereglementeerde beroepen in de Nederlandse economie komen wij uit op een jaarlijkse opbrengst van **0,06-0,1%** BBP als gevolg van hervormingen van de regelgeving voor gereglementeerde beroepen. Wanneer alle hervormingen volledig zijn doorgewerkt, kan deze opbrengst gezien worden als een structurele opbrengst. Om de totale opbrengst voor de economie

[3] De publieke sector is de ruime zin van het woord ook een grote speler in het bijdragen aan de andere sectoren.

te berekenen in de komende 10 jaar, gaan we ervan uit dat de volledige impact van de hervormingen 3 jaar na doorvoering van de hervormingen zichtbaar is. Over een periode van 10 jaar resulteert dit in een bate voor de Nederlandse economie van **2,3 tot 2,8 miljard euro**.

Hierbij tekenen we aan dat de verwachte baten mede worden bepaald door de hervormingen die andere EU landen doorvoeren. Als alle EU landen hun gereglementeerde beroepen hervormen, zoals is voorzien, dan hebben de effecten van hervormingen een impact op een grotere markt en kunnen extra baten worden verwacht.

### Beperkingen van de studie

Deze studie kent een aantal beperkingen. Ten eerste was het in het kader van deze studie niet mogelijk om een diepgaand onderzoek te doen naar alle gereglementeerde beroepen in Nederland. Hierdoor bestaat er onzekerheid over het exacte aantal personen werkzaam in gereglementeerde beroepen, vooral in de beroepen met een beperkt aantal professionals in Nederland. Ten tweede was het niet mogelijk om een diepgaand onderzoek te doen naar de mogelijkheden voor hervormingen in gereglementeerde beroepen. Hiervoor is een zorgvuldige analyse vereist gebaseerd op marktinformatie. Ten derde zorgt het ontbreken van literatuur over de effecten van de reglementering van beroepen in Nederland ervoor dat we slechts een illustratieve indicatie hebben kunnen geven van de potentiële baten die niet is gebaseerd op een robuust ijkpunt. Ten slotte is een onzekerheid dat de verwachte baten mede afhangen van de hervormingsmaatregelen die andere EU landen nemen.

We merken verder op dat hervormingen niet alleen kunnen leiden tot een hoger BBP, maar ook tot allerlei andere effecten die niet uitgebreid in dit rapport aan de orde komen. Zo kan modernisering van regelgeving door het verminderen van administratieve lasten leiden tot een hogere productiviteit door een efficiëntere werkwijze. Modernisering van gereglementeerde beroepen zou ook kunnen leiden tot meer grensoverschrijdende migratie. Een hogere Europese arbeidsmobiliteit kan een bijdrage leveren aan een efficiëntere en innovatievere dienstensector en een betere aansluiting tussen vraag en aanbod op zowel de arbeidsmarkt als de dienstverleningsmarkt. Dit zijn belangrijke baten die slechts ten dele tot uitdrukking komen in een hoger BBP. Daarnaast moeten mogelijke hervormingsmaatregelen zorgvuldig geanalyseerd worden om mogelijke negatieve of onbedoelde gevolgen te vermijden. Dergelijke analyses vielen niet binnen het kader van deze opdracht.

Tot slot merken wij op dat de mogelijke baten van een modernisering van gereglementeerde beroepen mede zal afhangen van eventuele aanvullende maatregelen gericht op bedrijven of dienstensectoren (en niet op beroepsbeoefenaren). Te denken valt bijvoorbeeld aan maatregelen gericht op het verbeteren van het vestigingsklimaat van bedrijven, zoals het verminderen van administratieve lasten en het wegnemen van toetredingsbelemmeringen. Derhalve adviseren wij om oog te hebben voor de bredere regulatorische context bij het analyseren van mogelijke moderniseringsmaatregelen voor gereglementeerde beroepen om de volledige vruchten van dit beleid te kunnen plukken.

# Summary

## Goal of the report

Recently, the modernization of the regulation of the regulated professions[4] has been proposed at the European level. According to the revised Professional Qualifications Directive[5] every Member State is obliged to evaluate statutory provisions on access to regulated professions.

The Netherlands has committed itself to an ambitious approach of the evaluation and would like to be an example for other Member States. For the purpose of this evaluation, the Netherlands Ministry of Economic Affairs (EZ) prepared a project plan (Nov 2013 - March 2016). The first steps of this plan include: (i) an inventory of existing regulated professions and (ii) a study on the economic opportunities and economic potential of the modernisation of the regulated professions in the Netherlands.

This report aims to provide a first insight into the economic potential of modernising regulated professions in the Netherlands.

The following **research questions** are addressed in this study:

1. What percentage of the Dutch economy is covered by the regulated professions?
2. Which regulated professions are the most promising in terms of economic benefits to be expected following modernization?
3. What are the expected economic benefits of modernisation of regulated professions over the next 10 years for the Dutch economy?

## Findings

At the start of this study the Ministry of Economic Affairs identified **167 regulated professions** in the Netherlands. This list with regulated professions is still under evaluation within the framework of a mutual evaluation exercise. Regulated professions are present in 27 sectors of the Dutch economy. The number of regulated professions differs a lot among the different sectors. The sector of **health and social services** has the most regulated professions in the Netherlands, with 73 regulated professions out of a total of 167. **Business services**, **agriculture, forestry and mining** follow as sectors where regulated professions have a relatively high share.

As the number of people occupied in regulated professions and their economic footprint has so far not been analysed for the Dutch economy, we developed a methodology to estimate the size and economic impact of the regulated professions in the Netherlands. Keeping in mind the exploratory nature of our work we conclude that the regulated professions cover somewhere between **9.5 and 15.6%** of the total employment in the Dutch economy. The lower-bound estimate in our opinion is more realistic, whereas the upper bound estimate is likely to be too high. Regulated professionals account for **8.8-15.4%** of value added in the whole economy, including indirect effects on users of these services in other sectors. When looking at the size of indirect effects in the Netherlands we see that they are the largest for the regulated professions within health and social services, business services, agriculture, forestry and mining and construction sectors[6].

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4 Directive 2006/123/EC of 12 December 2006 on services in the internal market.

5 Directive 2005/36/EC on the recognition of professional qualifications, as amended by directive 2013/55/EU.

6 One more large contributor to other sectors is the public sector in broad sense.

When looking at the economic importance of regulated professions, we conclude that regulated professions represent the largest shares of value added within the health and social services sectors, and the education sector. The contribution of regulated professions in business services is also relatively high. Given the economic importance of regulated professions in these sectors, it could – as a next step – be interesting to investigate where reforms can or should take place. We note that different criteria can potentially be used to select "promising" sectors for reform. The size and economic importance of regulated professions within a sector is just one of them. A closer study of the regulations and the potential for reform in each sector is required to reach more detailed conclusions and sector-specific policy recommendations.

Our study of available literature found that there is no literature which has studied the economic impact of reforming regulated professions in the Netherlands. Therefore, it is not possible to assess the expected impact of modernising Dutch regulated professions based on previous studies. However, there is a large body of literature on the economic impact of service sector reform. As regulated professions are also services activities, we see this as the best available proxy.

The available literature on service sector reform shows that there is a positive relationship between regulatory reform in services sectors and GDP. The majority of the literature on the Netherlands finds an expected impact of between **0.2** and **1.4%** of Dutch GDP of services sector modernisation, while studies focusing on an EU-wide implementation of the Services Directive find an expected impact of **0.5-1.5%** of EU GDP. Given that the reforms analysed are generally wider in scope than a modernisation of regulated professions, they cannot generally be seen as the expected benefit of modernising regulated professions. The results of these studies do provide an indication that the expected benefit can be positive and significant.

To still provide an illustration of the size of the potential economic impact in the Netherlands, we assume that a lower bound of the estimates discussed above is a relevant starting point. Also taking into account the share of regulated professions in the Dutch economy, we show that modernisation of regulated professions in the Dutch economy could lead to an annual benefit of **0.06-0.1% of GDP** for the Dutch economy. This can be seen as a structural impact after all modernisation measures have taken full effect. In order to calculate the economic benefit of modernisation in regulated professions *in the next ten years*, we assume that the full effect is reached three years after the implementation of modernisation measures. Over a period of 10 years, a rough indication of the net present value of the economic benefits is **2.3 – 3.8 bln. euros**.

The expected benefits also depend on measures taken in EU-countries outside the Netherlands. If all EU-countries modernise their regulated professions, as is foreseen, additional benefits can be expected because the reforms have impact on a larger market.

### Limitations to the study

There are important caveats to the above high level analysis. First, we have not been able to perform an in-depth analysis for all regulated professions in the Netherlands. Therefore, there is uncertainty regarding the exact number of persons occupied in a regulated professions, especially in relatively "small" professions with a limited number of professionals. Second, we have also not been able to perform an in-depth analysis of the potential for reform in each profession, as this requires extensive market research. Third, the lack of studies on regulated professions in the Netherlands allowed us to only provide an illustrative indication of potential benefits of reform, which is not based on a solid benchmark. Finally, we note that the expected benefits also depend on measures taken in EU-countries outside the Netherlands, which is still uncertain.

A more general observation is that the benefits of reforms are only partially measured by GDP. For example, modernisation measures such as a lowering of the administrative burden can also lead to a higher productivity by working more efficient. Another effect is that modernisation will lead to more cross-border migration in regulated professions resulting in more competition, a more efficient and innovative services market and a better fit between supply and demand on the labour market (quality) and service market (costs). These are important benefits which are only partly measured by GDP. Moreover, any potential modernisation of regulated professions should be carefully assessed to avoid negative or unintended potential side-effects, which have not been taken into account in the above calculations and discussions.

Finally, we note that any benefits of modernising regulated professions may at least in part depend on the implementation of accompanying measures. Such accompanying measures may relate to regulations at company level (e.g. administrative obligations or national standards that need to be met before activities in a certain sector may be undertaken). Therefore, we advise to assess the whole “regulatory” environment for services activities, to ensure that a modernisation of professions’ regulations will bear full fruit.

# 1 Introduction

## 1.1 Background

Lawyers and notaries, doctors and teachers are among the oldest professions in the world but are also among the most regulated ones in Europe. In a large number of Member States, the regulations of lawyers, doctors and others exist which cover required qualifications, and sometimes also cover restrictions on pricing (e.g. fixed fee scales), advertising (e.g. restrictions or bans on comparative or price advertising), inter-professional co-operation and business structure. These types of professions often also enjoy a wide range of exclusive rights. However, little is known about the presence of these types of professions in the Netherlands and their economic contribution, which is the topic of this report.

### Regulation of the professions could possibly hamper economic growth

Regulated professions are services, like legal services, accountancy services, pharmacy services or medical services, which require specific qualifications to allow a person to practice this profession.

> **Professional Qualifications Directive 2005/36/EC (c.f. Article 3-1 a):**
> *'A **regulated profession** is professional activity or group of professional activities, access to which, the pursuit of which, or one of the modes of pursuit[7] of which is subject, directly or indirectly, by virtue of legislative, regulatory or administrative provisions to the possession of specific professional qualifications[8];*

Regulated professions are therefore those to which access is conditional upon the possession of specific qualifications. Often the use of a specific title is protected. There are currently around 800 different regulated professions in the European Union[9][10]. Reasons to regulate professions include for example consumer protection, public goods, health and safety. However, when the conditions to obtain a specific qualification are too restrictive this may hamper the free movement of labour and the delivery of cross-border services in the EU. Improving access to these types of professions, for example, through a more flexible and transparent regulatory environment in Member States, would facilitate the mobility of qualified professionals in the EU and result in larger cross-border provision of professional services. A recent Communication of the European Commission reports, that a more modern regulatory environment should have a positive impact on the employment situation and enhance economic growth.[11]

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7 The mode of pursuit of a regulated profession also covers situations in which the use of a professional title is limited by legislative or regulatory provisions to holders of a specific professional qualification (as specified in Article 3(2) of the Directive).

8 Art 3 (1b) states that a professional qualification is "attested by evidence of formal qualifications, an attestation of competence referred to in Article 11, point (a) (i) and/or professional experience. Art 3(1c) states that (c) 'evidence of formal qualifications': diplomas, certificates and other evidence issued by an authority in a Member State designated pursuant to legislative, regulatory or administrative provisions of that Member State and certifying successful completion of professional training obtained mainly in the Community'.

9 Database of regulated professions in EU: http://ec.europa.eu/internal_market/qualifications/regprof/index.cfm?action=regprofs.

10 Some professions are not officially regulated, for example, a real estate agent. Since 2001 the Netherlands does not officially regulate it, thus the title of a real estate agent ('makelaar') is not a protected. Nevertheless, the main professional federations: NVM (Dutch Federation of Real Estate Agents), VBO (Association of Real Estate Agents) and VastgoedPro formulated their own voluntary admission requirements to promote high quality of the services. Thus, when a person wants to become a member of these professional associations, a real estate agents should undertake a certification procedure which is linked to specific educational and qualification requirements and also requires adherence to a code of conduct.

11 COM(2013) 676 final.

## 1.2 The goal of the report

Recently, the modernization of the regulation of the regulated professions has been agreed at the European level. According to the Professional Qualifications Directive[12] every Member State is obliged to evaluate statutory provisions on access to regulated professions.

The Netherlands has committed itself to an ambitious approach of the evaluation and would like to be an example for other Member States and to take a leading role. For the purpose of this evaluation, the Ministry of Economic Affairs (EZ) prepared a project plan (Nov 2013 - March 2016). The first steps of this plan include: (i) to make an inventory of existing regulated professions and (ii) to undertake a study on the economic opportunities and economic potential of the modernization of the regulated professions in the Netherlands.

This study contributes to the second step of this project plan as it aims to get a better understanding of the size and economic contribution of regulated professions in the Netherlands. Based on an analysis of available data and a review of the literature, this study provides an indication of the number of professionals which qualify as having a regulated profession. Moreover, we analyse the extent in which these professions are present in different sectors of the Dutch economy, and provide an estimate of their economic importance. Finally, we also provide an indication of the potential benefits that could be achieved if the regulation of Dutch professions is modernised. The scope of the project is limited; our findings should be interpreted as a rough first indication. An in-depth analysis of all regulated professions, including an investigation of various modernisation options, is beyond the scope of this report.

The following **research questions** are addressed in this study:

1. What percentage of the Dutch economy is covered by regulated professions?
2. Which regulated professions are the most promising in terms of economic benefits to be expected following modernization?
3. What are the expected economic benefits of modernisation of regulated professions over the next 10 years for the Dutch economy?

## 1.3 Reading guide

The remainder of the report is organized as follows**. Chapter 2** starts with an inventory of the regulated professions in the Netherlands. The methodology adopted to estimate the coverage of the regulated professions is discussed and the results are reported. Furthermore, this chapter sheds light on the economic contribution of regulated professions in the Netherlands. **Chapter 3** discusses the available literature on the economic impact of the modernisation of regulated professions. As there is limited literature available specifically for regulated professions, we also include literature on services sector liberalisation in this discussion as regulated professions are also service providers. We see the impact of service sector liberalisation as a potential proxy for the economic impact of liberalising regulated professions. Finally, Section 3.4 summarizes the results in terms of economic impact and provides some recommendations for further research.

[12] Directive 2005/36/EC on the recognition of professional qualifications.

# 2 Regulated professions in the Netherlands

As defined in Chapter 1, the regulated professions are those to which access is conditional upon the possession of specific qualifications. Often the use of a specific title is protected and/or there are reserved activities[13]. There are two types of regulations applicable to the term regulated professions: licencing based on qualifications (the professions are regulated as a whole) and protected titles.[14] For example before being able to work as a lawyer (advocaat) one needs to apply to the relevant competent authority (Orde van Advocaten) for admission to professional practice and one needs to have a diploma of post-secondary level (3-4 years).

To the knowledge of authors there is no research conducted on how much regulated professions contribute to the Dutch economy. Therefore, a methodology needed to be developed to estimate the share of regulated professions in the Netherlands. In this chapter we present our approach and conclusions regarding the contribution of the regulated professions to the Dutch economy.

## 2.1 Introduction of the methodology applied

Before we analyse the economic importance and impact of regulated professions, we present an overview of our methodology. The details of this methodology and the results are elaborated in the remainder of this chapter.

To the knowledge of authors, there is no central data on numbers of people working in regulated professions[15]. There are data available by broad occupational groups. We have matched this data with information on the regulated professions (*top-down approach*[16]). The data by broad occupational groups, however, may include non-regulated professions besides the regulated professions. The extent to which non-regulated professions are included in the data by broad occupational groups is however not known. Therefore, the top-down approach gives an upper-bound estimate of the number of regulated professionals.

Besides the matching with broad occupational groups we have also looked at how many people are registered in a certain profession (*bottom-up approach*) but this information is only available for some occupations. Moreover, in cases where it is likely that a regulated profession does *not* cover the whole occupational group, we made a rough estimate of their likely share (see Chapter 2.3 for details on the methodology used). The detailed results of both the top-down and bottom-up approaches can be found in the Annexes of this report.

By combining the information from these two sources, we are able to present a lower and an upper bound of employment of regulated professionals and from that we calculate the boundaries of the share of regulated professionals in the economy. This is also due to the fact that there is no data on the exact number of regulated professionals available. As the bottom-up numbers include more information, we see the bottom-up estimates the more realistic ones. However, the top-down estimates do have the advantage that they are directly linked to official statistics.

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13 We follow the definition of a regulated profession as it is specified in Directive 2005/36/EC as it quoted in Chapter 1.

14 The categorization of the regulated professions by the type of the regulation is outside the scope of this study.

15 This is also mentioned in another recent study: Koumenta et al. (2014).

16 More on the top-down approach is explained in Chapter 2.3 ( Step 2).

Below we describe the steps we took in order to calculate the economic importance of the regulated professions measured by the share in employment (based on top-down and bottom-up approaches), the share of GDP and the impact on other sectors. The main steps are:

1. Identifying regulated professions in the Netherlands;
2. Matching the regulated professions with ISCO-codes;
3. Analysing the share of the regulated professions by sector;
4. Calculating the economic contribution of the regulated professions.

Below we elaborate on each of these steps and also present the results of each step.

## 2.2 Step 1. Identifying regulated professions in the Netherlands

In order to identify the regulated professions in the Netherlands we have gathered information from the following sources[17]:

- Regulation determining the list from regulated professions by the Dutch Ministry of Education, Culture and Science[18];
- Current list of regulated professions compiled by the Dutch Ministry of Economic Affairs;
- The database of regulated professions maintained by the European Commission, DG MARKT[19] that falls under the Directive of the European Parliament and the Council concerning the recognition of professions qualifications[20];
- The website of Nuffic specifying the regulated professions and the competent authority[21].

In the Netherlands the number of regulated professions is around 167[22] in 2014. Compared to other countries, the Netherlands is somewhere in the middle in terms of the number of regulated professions. For example, there are more than 300 regulated occupation in Czech Republic, Slovenia and Poland but less than 100 in Finland and France[23]. However, it should be noted that the number of regulated professions is difficult to compare internationally, as this depends on the definitions and way of aggregation of the different professions. Moreover, the number of regulated professions in itself does not say anything about the way the are regulated. Regulation can for example consist of licensing based on qualifications, protected titles, or mandatory certification, with different economic effects. If professions are only relatively lightly regulated in one country, the economic impact of the regulation may be smaller than in another country even though the number of regulated professions in the former country is higher than in the latter.

## 2.3 Step 2. Matching the regulated professions with ISCO-codes

In order to estimate the number of workers with a regulated profession we match the regulated professions in the Netherlands with the occupations specified in the International Standard Classification of Occupations, ISCO-08 code (up to four digits). The full list is presented in Annex 2. This classification does not provide an exact match with the professions as some of the data are only available by broad occupational groups. This means that the occupations identified in the ISCO classification may include non-regulated professions besides the regulated professions. This

17 Due to the fact that during the implementation of this study the list of regulated professions has been revised, we use those professions that were already included in lists prior to the beginning of the study.

18 http://wetten.overheid.nl/BWBR0023396/geldigheidsdatum_15-02-2014.

19 http://ec.europa.eu/internal_market/qualifications/regprof/.

20 http://eur-lex.europa.eu/LexUriServ/LexUriServ.do?uri=OJ:L:2005:255:0022:0142:nl:PDF.

21 http://www.nuffic.nl/diplomawaardering/beroepserkenning/gereglementeerde-beroepen-en-bevoegde-autoriteiten.

22 However, the profession 'Gastouder in de kinderopvang' is regulated, we could not match it to the classification of sectors like NACE of second revision.

23 http://ec.europa.eu/internal_market/qualifications/docs/news/20120214-report_en.pdf.

could result in an overestimation of the number of regulated professionals. Therefore, in our bottom-up calculations we make corrections in cases where overestimation is evident (see below). The top-down estimates should therefore be seen as an upper-bound in the study.

For example, the ISCO classification identifies the profession of a field crop and vegetable grower while in the Netherlands there are at least two regulated professions that fall under this category (Beheerder landbouwspuitbedrijf; Uitvoerder gewasbescherming). In case of the mechanical engineering technicians, there is only one profession that is regulated in the Netherlands (Lpg-technicus) while ISCO code clearly includes more occupations. Therefore, the two types of classifications do not always match. In general, it is likely that using the ISCO classification leads to an overestimation of employment in regulated professions, as some categories may also include professions which are not regulated in the Netherlands.

After assigning the ISCO codes to the regulated professions in the Netherlands, the regulated professions were matched with the European Labour Force Survey[24]. As a result of this step we obtained the data on employment by occupation (*top-down approach*).

Since the data in the Survey is at the level of broad occupational groups, we (whenever possible) also collected data on employment gathered by associations where regulated professionals work[25] (*bottom-up approach* of data collection). For example, for the education sector we used the DUO database[26], while for the health sector we used the BIG register[27], for other sectors we used other registers for smaller sectors[28][29]. Here we assumed that people who have registered themselves as a regulated professional are actually active in this profession.

For other professions, where is was evident that the top-down numbers would result in an overestimation, we made a rough assessment of the share of employees in the regulated professions as part of the occupational group reported in the European Labour Force Survey. As we do not have detailed information on the composition of employment in each sector, we had to make a subjective estimate based on the description of the categories. For example, as the Dutch regulated profession “Installateur alarmapparatuur” is very specific, we assumed that only 5% of employment in the sector “Building and related electricians” can be attributed to people who install alarm installations. Where we thought it to be likely that no non-regulated professions are present in a certain sector, we assumed 100% of the employment in that sector to be regulated. In other cases, where a professions was not too specific but was deemed unlikey to cover 100% of employment in a certain sector, we allocated 50% of employment to the regulated profession. In this way, all the sectors were assessed, allocating either a 5%, 50% or 100% share of employment to regulated professions (see Annex 2 for the choices made)[30].

As a result a lower-bound of the bandwidth is calculated for share of the regulated professions in employment, which are reported as our bottom-up estimates. Although the classification is somewhat arbitrary, we think this is a more useful approach than simply assuming that 100% of employment in a sector is a regulated profession, as implicitly assumed in the top-down approach.

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24 It is a dataset, a large household sample survey providing data on labour participation of employees and self-employed aged 15 and over, living in private households. It is available in Eurostat.

25 Most of the corresponding registers are not accessible for public and the data in some registers is not always up-to-date.

26 http://www.duo.nl/organisatie/open_onderwijsdata/databestanden/default.asp.

27 https://www.bigregister.nl/.

28 The list of registers is available on the website https://www.cibg.nl/productenendiensten/.

29 From now on we use the term *bottom-up approach* when data collected from the associations on the number of regulated employees; and *top-down approach* when data was (also) collected on the sector level.

30 This is also part of a bottom-up approach.

## 2.4 Step 3. Analysing the share of the regulated professions by sector

As mentioned earlier, to the knowledge of the authors there is no research conducted on how much regulated professions contribute to the Dutch economy, therefore we first theoretically identify the channels through which the professionals might affect the economy and then we estimate the share of the regulated professions in the economy by sector.

### How can regulated professions affect the economy?

The regulated professions might have an impact on the economy in a number of ways. First of all, the presence of regulated professions might have an impact on the structure and the size of the market. Since an individual needs to obtain a certain educational degree this could be perceived as an entry barrier. In that case, the number of suppliers of services might be restricted, thus limiting the competition on the market. For some professions, there are also limits to the number of students that are allowed to enrol in educational programmes (e.g. surgeons). The regulated nature of these professions could also lead to reduced possibilities of firms to experience economies of scale due to the decreased range of services that could be offered compared to the situation when a market does not have any entry restriction.[31] Another potential effect that the regulated professions have is on the sectoral competitiveness. Since there are entry barriers, there is a risk that the regulations might have a negative impact on the growth and productivity of a sector if these regulations are more restrictive than necessary to achieve public objectives.[32]

Any economic effects arising from the regulated professions are not limited only to the sectors where those professions are active. There will also be spillover effects on other sectors which use the services of the regulated professionals. These spillovers effects are also called a “multiplier effect” on other sectors resulting from the use of these services in other sectors. In this way, the economic performance of regulated professions can have a much broader influence than just in the “own” sectors of regulated professions. The competitiveness of the whole economy can in principle be influenced.[33]

### How big is the share of the regulated professions in the Netherlands?

In order to empirically estimate the contribution of regulated professions to the Dutch economy, we first map the regulated professions with the sectors using the data gathered in the steps before and match this with the list of Dutch sectors in the economy that we took from Central Bureau of Statistics (CBS, Centraal Bureau voor de Statistiek). The full list of the regulated professions by sector is presented in Annex 2.

The employment figures for every regulated profession collected from European Union Labour Force Survey for the latest year available (annual data, 2012) and information from registers of regulated professions are also matched with the sectors. The n umbers also include the self-employed, such as dentists (tandarts) and general practitioners (huisarts).

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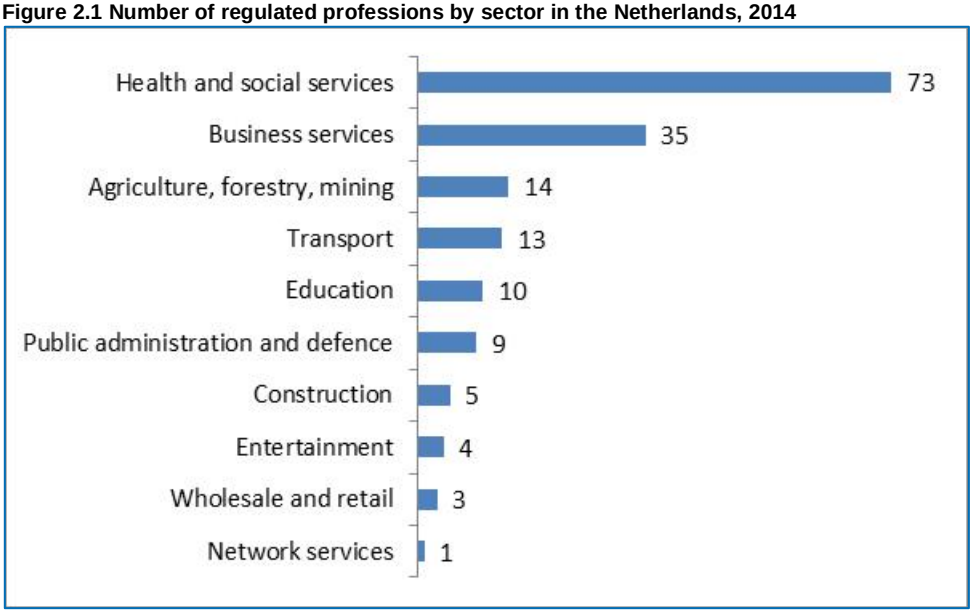
[31] Sebastian et al. (2007) stress that in the sphere of legal services, conveyancing in the UK was deregulated in 1990. This attracted new players on the market affecting the structure of the market. This has led to innovation in the design of services so that consumers have a wider choice between a full service commonly provided by solicitors, which may include legal advice, and a ‘no-frills’ service provided by low-cost conveyancers that focuses on the administrative process. For example, Sebastian et al. (2007) highlights that due to the deregulation on the regulated professions in the UK there was a reduction in the prices of services. After changes in the regulation of the notarial profession in the Netherlands in 1999 the customer service, innovation, the use of technology, efficiency and customer friendliness have improved. Moreover, the fees of the notaries have fallen substantially by 37.5% resulting in an annual welfare gain to consumers of 347.64 million euro. There has also been a positive increase in the number of notaries (+12%) since 1999 and their employees (+22%).

[32] See for example COM(2013) 676 final and OECD (2009). Paterson, Fink, Ogus (2003) did a survey where one of the questions to the respondents was ‘Why regulate professional services?’.

[33] See for example OECD (2009).

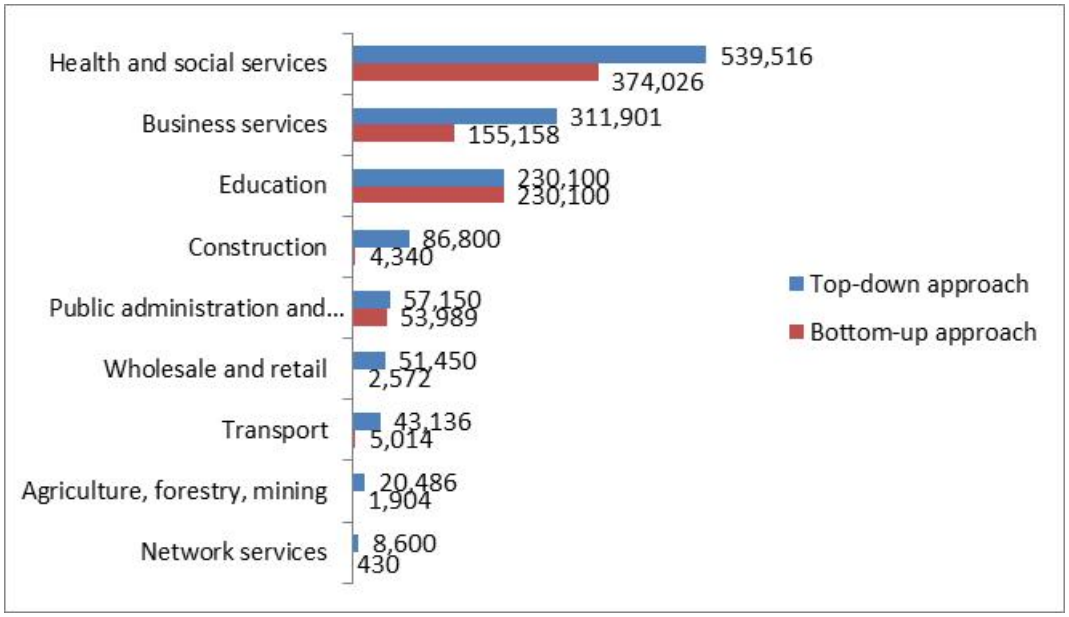
**Figure 2.1 Number of regulated professions by sector in the Netherlands, 2014**




Source: Database of regulated professions, DG MARKT, EC; Dutch Ministry of Economic Affairs.

When we analyse the number of regulated professions per sector it becomes clear that the sector of health and social services has the most regulated professions in the Netherlands, with 73 regulated professions out of a total of 167, or 44% of the regulated professions (see Figure 2.1). Business services (20%), agriculture, forestry and mining (8%) follow as they have less regulated professions in terms of employees. Wholesale and retail sector and entertainment sectors have few regulated occupations within the sector (4 and 3 respectively). There is only one regulated profession in the network services.

**Figure 2.2 Employment of regulated professionals by sector, 2012**

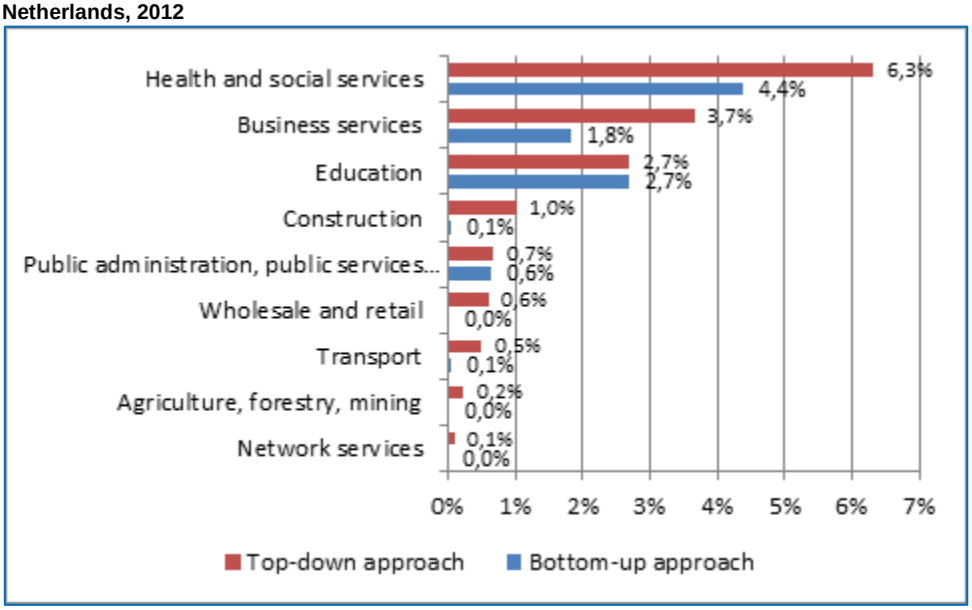



Source: European Union Labour Force Survey, Eurostat, Ecorys calculations.
Note: the data for the sector Entertainment are not reported due to the fact that the employment figures are below 2500 people.

The employment of regulated professionals by sector (Figure 2.2) differs by approach, where the top-down estimates provide an upper bound and the bottom-up numbers provide a more realistic lower-bound indication. According to the top-down approach, more than 500.000 people in the

health and social services sector have a regulated profession, with business services and education following with 311.000 and 230.00 regulated professionals respectively. Employment of regulated professionals is significantly lower in other sectors. Adding up all the regulated professionals leads to a top-down estimate of 1.4 mln persons, which represents 15.6% of the total employment within the Dutch economy. This is an overestimation of the total number of employees within the regulated occupations as we matched it in some cases to broader categories of occupations. Figure 2.2 also shows that the bottom-up estimates are significantly lower than the top-down estimates, but the "ranking" of sectors in terms of regulated professionals hardly changes. Health and social services again has the highest "regulated employment", followed by education and business services. Adding up all the employment numbers leads to a grand total of almost 828 thousand people (9.5% of total employment in the Netherlands) that work in a regulated profession according to the bottom-up approach. Figure 2.3. shows the results for both top-down and bottom-up in terms of the shares in total employment in the Netherlands.

**Figure 2.3 Share of the regulated professionals by sector as a percentage of the total employment in the Netherlands, 2012**




Source: European Union Labour Force Survey, Eurostat, Ecorys calculations.
Note: the data for the sector Entertainment are not reported due to the fact that the employment figures are below 2500 people.

## 2.5 Step 4. Calculating the economic contribution of the regulated professions

The contribution of the regulated professionals to the whole economy of the Netherlands can be measured in terms of the goods and services that are produced. In order to estimate the economic importance of the regulated professions we use an input-output model, which captures the interlinkages of the sectors in the economy. The purpose is to show how the output of a regulated profession in one sector may indirectly affect other sectors through their use of inputs. This is called a so-called input-output model.

*Input-Output model*

An Input-Output model can be used to determine the impact on the economy caused by a one euro change in final demand for any given sector. Goods and services produced in one sector are consumed by the sector itself and other sectors, thus they are the intermediate inputs for other sectors. Sectors, providing goods and services for consumption, also purchase goods and services from other producers. Thus the change in the demand from one sector can affect the production of

the sector itself (this is a so called direct effect) and can affect the production of other sectors (this is a so called indirect effect of the change in demand in the original industry).

To estimate the relative importance of the regulated professions in the Netherlands we use an input-output model of the Dutch economy. The model is based on CBS data on purchases and sales of goods and services in each sector of the economy. The data is obtained from CBS[34]. Input-Output table for 2012, the latest available data, is based on basic prices according to SBI (Standaard Bedrijfsindeling) 2008 classification. The SBI 2008 classification is based on the activity classification of the European Union NACE (Nomenclature statistique des activités économiques dans la Communauté Européenne, NACE) and on the classification of the United Nations (International Standard Industrial Classification of All Economic Activities, ISIC). We use the data of up to four digits which coincide with the first four digits of NACE Revision 2.

Before we start calculating the economic impacts of the regulated professions in the Dutch economy, we estimate how much the regulated professions contribute to the total production of a sector they are matched to.

The following steps were taken in order to do so:

1. Collection of the data on wages in the sector. The sector level data was obtained from CBS. This enables us to calculate the total wage income share in the sector;
2. Calculation of part-time factor in the sector based on the data on the number of persons employed in the sectors and the labour years. We assume that it is the same for the whole sector as for the regulated professions;
3. Collection of the data on the wages of the regulated professionals in the Netherlands. The average wages for every regulated professions were collected from Loonwijzer (www.loonwijzer.nl), which is a wage indicator survey with more than 17,000 professions listed. The average wage was calculated as a wage of a professional with fifteen years of experience, assuming that the data from Loonwijzer is representative. We consider this a reasonable approximation of the wage of a professional as we use the relatively higher wages of people with fifteen years of experience, corresponding to the notion that the regulated professions are relatively well paid. The wages of professions related to the maritime sector like ship's deck officer (stuurman) were collected from Ecorys (2009)[35]. Due to the fact that the data are of several years old we correct for inflation;
4. Calculation of the (wage) income share of the regulated professionals as a percentage of the total (wage) income earned in a sector (see step 1 above). We assume that the share of income earned in production by regulated professionals relative to the total income earned in a sector is the same as the share of the (wage) income of regulated professionals.

The steps above result in the next overview in table 2.1.

[34] Centraal Bureau voor de Statistiek.

[35] Ecorys (2009), Final report 'Study on the Labour Market and Employment Conditions in Intra-Community Regular Maritime Transport Services Carried out by Ships under Member States' or Third Countries' Flags' for EC, Directorate-General Energy and Transport.

**Table 2.1 Overview of the sectors and their contribution to the economy**

| Sector | Value added (mln euros) | Share of regulated professionals in the employment of the sector (top-down approach) | Share of regulated professionals in the employment of the sector (bottom-up approach) | Income share of the regulated professions in the sector (top-down approach) | Income share of the regulated professions in the sector (bottom-up approach) |
|---|---|---|---|---|---|
| Agriculture, forestry and mining | 29724 | 8.0% | 0.5% | 10.23% | 1.12% |
| Business services | 44567 | 22.9% | 7.8% | 29.58% | 9.74% |
| Construction | 26551 | 18.5% | 0.9% | 17.16% | 0.86% |
| Education | 27064 | 48.0% | 48.0% | 48.44% | 48.44% |
| Entertainment | 4938 | 1.3% | 0.2% | 1.55% | 1.03% |
| Financial services | 46385 | 0 | 0 | 0 | 0 |
| Human and social activities | 55952 | 39.4% | 27.3% | 56.13% | 40.27% |
| Manufacturing | 67968 | 0 | 0 | 0 | 0 |
| Network services | 40178 | 2.2% | 0.1% | 7.92% | 0.40% |
| Other services | 8883 | 0 | 0 | 0 | 0 |
| Real estate | 31551 | 0 | 0 | 0 | 0 |
| Tourism | 9392 | 0 | 0 | 0 | 0 |
| Transport | 23868 | 12.9% | 0.6% | 15.13% | 1.58% |
| Wholesale and retail | 66890 | 3.6% | 0 | 0 | 0.27% |
| Public administration and defence | 39194 | 11.8% | 11.2% | 12.57% | 11.87% |

Source: Ecorys calculations.

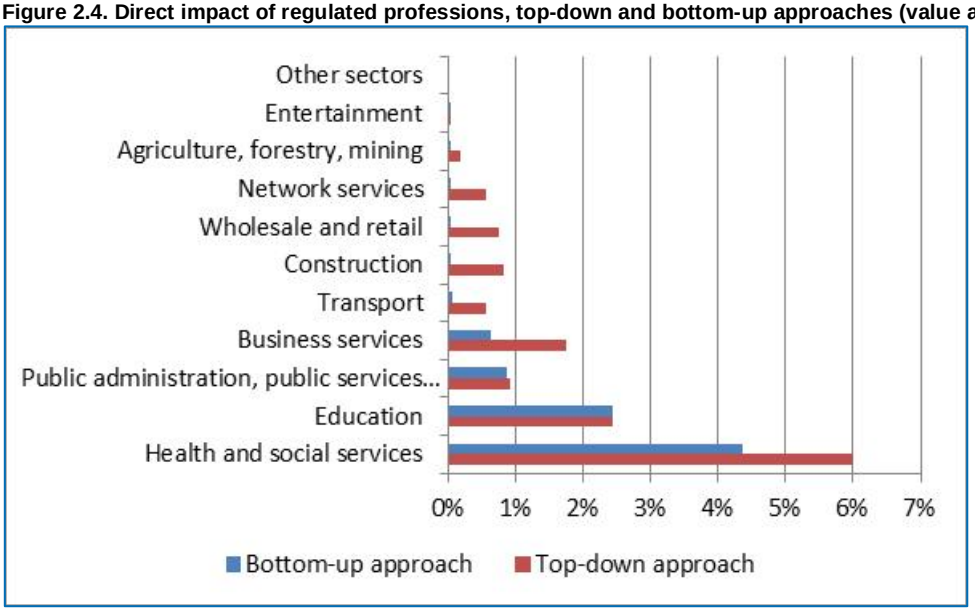
Knowing the production shares of the regulated professionals in every sector of the Dutch economy we calculate the direct and indirect contribution to the Dutch economy. Again we assume that the so-called input-output relation between and within sectors is the same for regulated professions as it is for the sector as a whole. Thus we calculated the economic contribution of the regulated professions by multiplying the share of the income in production generated by the regulated professionals with the value added generated in the sector.

### *Direct contribution*

In Figure 2.4, the direct contribution of regulated professions in each sector is calculated in terms of value added (contribution to GDP). The biggest contribution to Dutch GDP comes from sectors like health and social services, education, public administration, and business services. Health and social services contribute in a range between 4.4% and 6% of the total Dutch GDP, whereas education is around 2,5%. Most other sectors have a direct contribution of below 1% of GDP.

Adding all these impact together results according to the bottom-up approach in a total value added, due to regulated professions, of 45 bln. euros or 8.5% of the GDP. The top-down approach gives a higher result: the total value added, due to the regulated professions, accounts for 75 bln euros or 14% of the GDP.

**Figure 2.4. Direct impact of regulated professions, top-down and bottom-up approaches (value added)**




Source: CBS and data from associations, Ecorys calculations.

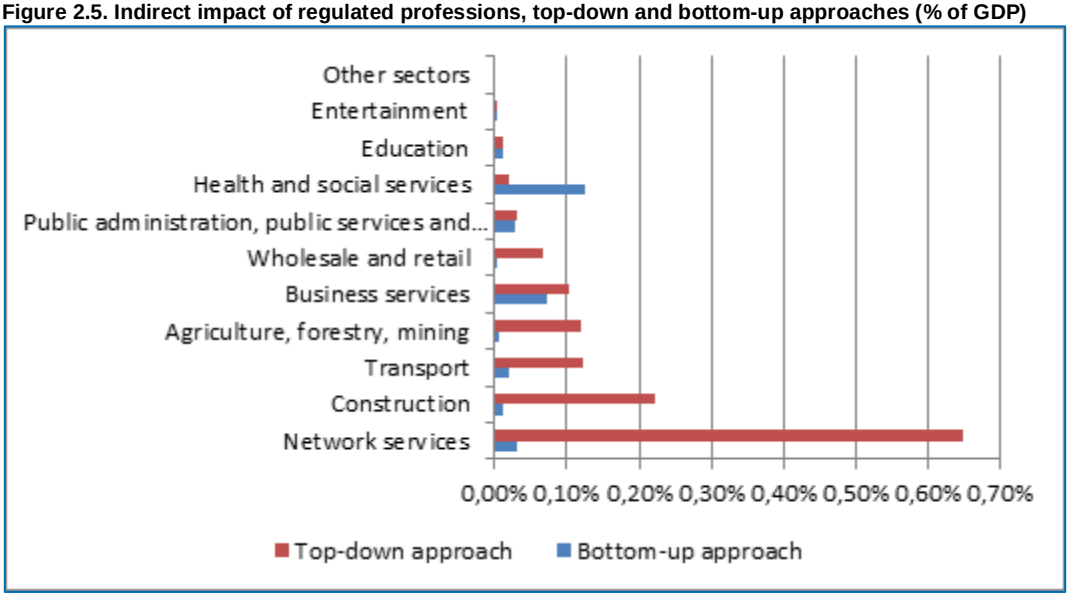
*Indirect contribution*

For each sector of the economy we calculated, through the input-output model, the linkages (in terms of value added) of regulated professions to other sectors. This analysis is relevant because it shows that reforms of regulated professions can have an important effect on sectors outside the sector where the reforms have taken place, because many sectors use regulated professions as an input for their own production process.

Figure 2.5 shows the size of the calculated indirect effects. According to the top-down approach, the largest (0.65%)indirect contributor is the cluster of sectors network services, which is to a significant extent due to the sub-sector electricity, gas, steam and air conditioning supply. On the other hand, according to the bottom-up approach the spillover effect is relatively small, 0.03% of GDP. This means that one euro generated by the regulated profession in this sector will result in additional value added in other sectors of around 0.01 euros in other sectors. Business services are an important contributor to indirect effects, both from a bottom-up and a top-down perspective (0.07-0.1 % GDP). Another significant contributor to other sectors is the Construction sector, which generates 0.12% of GDP of indirect effects, because the construction sector is an important supplier for other sectors[36]. For the health and social services sector the results of both approaches are very similar: the spillover effect is in between 0.12% and 0.17% of GDP. Together all regulated professions generate an indirect effect between 1.6 and 7 bln euros that spills over to other sectors, accounting for 0.3 – 1.3% of GDP.

[36] This is an average of the range of top-down and bottom-up approaches that the construction sector generates.

**Figure 2.5. Indirect impact of regulated professions, top-down and bottom-up approaches (% of GDP)**




Source: CBS and data from associations, Ecorys calculations.

## 2.6 Conclusion

In this chapter we explored the sizes of the regulated professions in the Netherlands in terms of employees and economic contribution to the Dutch economy. Although it is difficult to extract the regulated professions from the regular professions in the existing datasets, this chapter gives a first insight and as a result a first estimation.

At the beginning of this study the Ministry of Economic Affairs identified **167 regulated professions** in the Netherlands. This list with regulated professions was not yet fully updated but the largest professions in terms of number employees were present. The regulated professions are present in 27 sectors of the economy. The number of regulated professions differs a lot among the different sectors.

The exact number of employees in regulated professions is not available in national datasets and also the economic footprint of the regulated professions has so far not been identified. Due to this lack of data we developed a four-step methodology, as presented in this chapter, to estimate the size and economic impact of the regulated professions. As part of this exercise, we matched the ISCO-codes of the regulated professions with the sector SBI-2008 classification. Identification and isolation of all the regulated professions for each sector was not possible within the scope of this study.

To calculate the upper-bound of size and economic impact we assumed that the number of employees in regulated professions is the same as the number of employees reported in Labour Force Statistics. Due to this approach we overestimated the share of the regulated professions within the sector as whole. However from a research perspective this is the most accurate way to identify size and economic impact without making subjective assumptions. As such the calculations presented in the paragraphs above represent the upper-bound calculation.

In order to identify the more likely size and economic impact of the regulated professions we made a rough assessment of the expected share of employees in regulated professions as part of the total sector. For this we made a distinction between shares of 5%, 50% or 100% per sector (see Annex 2 for the choices made). As a result a lower-bound of the bandwidth is calculated for size

and economic impact of the regulated professions. We used the exact same methodology as presented in this chapter, with the difference of *estimating* the share of regulated professions in number of employees per sector.

Following the presented methodology and keeping in mind that it represents a first exploration of the size and economic footprint we can conclude that the regulated professions cover somewhere between 9.5 and 15.6% of the total employment in the Dutch economy. In which the lower-bound result represents a more realistic calculation and the upper-bound represents a maximum contribution. The regulated professionals account for 8.8-15.4% value added in the whole economy (including indirect effects). When looking at indirect effects in the Netherlands we see that the regulated professions within health and social services, business services, agriculture, forestry and mining and construction sectors are contributing the most to the Dutch economy through spillovers to other sectors[37].

When looking at the economic importance of regulated professions, we conclude that regulated professions represent the largest shares of value added within the health and social services sectors, and the education sector. Given the economic importance of regulated professions in these sectors, it could – as a next step – be interesting to investigate where reforms can or should take place. We note that different criteria can potentially be used to select "promising" sectors for reform. The size and economic importance of regulated professions within a sector is just one of them. A closer study of the regulations and the potential for reform in each sector is required to reach more detailed conclusions.

**Table 2.2 Direct and indirect impact of regulated professions (% of value added)**

| Sector | Bottom-up approach | | | Top-down approach | | |
|---|---|---|---|---|---|---|
| | Direct effect, % | Indirect effect, % | Total effect, % | Direct effect, % | Indirect effect, % | Total effect, % |
| Health and social services | 4.37 | 0.13 | 4.49 | 6.00 | 0.02 | 6.03 |
| Education | 2.44 | 0.01 | 2.45 | 2.44 | 0.01 | 2.45 |
| Public administration, public services and compulsory social security | 0.86 | 0.03 | 0.89 | 0.92 | 0.03 | 0.95 |
| Business services | 0.62 | 0.07 | 0.69 | 1.74 | 0.10 | 1.84 |
| Transport | 0.07 | 0.02 | 0.09 | 0.54 | 0.12 | 0.67 |
| Construction | 0.04 | 0.01 | 0.05 | 0.82 | 0.22 | 1.04 |
| Wholesale and retail | 0.04 | 0.00 | 0.04 | 0.74 | 0.07 | 0.80 |
| Network services | 0.03 | 0.03 | 0.06 | 0.55 | 0.65 | 1.20 |
| Agriculture, forestry, mining | 0.01 | 0.01 | 0.02 | 0.18 | 0.12 | 0.30 |
| Entertainment | 0.00 | 0.00 | 0.00 | 0.01 | 0.00 | 0.01 |
| Other sectors | 0.00 | 0 | 0.00 | 0 | 0 | 0.00 |
| **Total economy** | **8.5** | **0.3** | **8.8** | **13.9** | **1.3** | **15.4** |

Source: Ecorys calculations.
Note: the sum of direct and indirect effects might not be equal to the total effect due to rounding.

[37] One more large contributor to other sectors is the public sector in broad sense.

# 3 Impact of modernising regulated professions

Due to the fact that literature on economic impact of the regulated professions on the total economy is limited, we looked at literature on a broader level, namely at sector level. Since the regulated professions are largely present in the services sectors we first looked at the potential effect of reforms in the services sector and the effects this could have on the economy (paragraph 3.1, 3.2 and 3.3) before estimating its economic effect on the regulated professions for the Dutch economy in the next ten years (paragraph 3.4).

For this purpose we mapped the existing literature with the effects it predicts. We looked at the services sector reform and how it affects the overall economic performance. The reason we look at the services sector is the absence of specific literature on the expected impact of reforming regulated professions. As regulated professions are also services activities, we see this as the best available proxy. Furthermore we looked at literature on the link between the services and manufacturing industries and how performance of one sector can affect the other. The findings show how the liberalisation/modernisation of the services sector affects the services sector and the whole economy. We use the findings in the literature review as a proxy to identify the expected economic benefits of modernisation of regulated professions over the next 10 years for the Dutch economy. Note that we have not analysed what measures are required to achieve modernisation.

The studies presented in this chapter were selected because they were primarily concerned with an empirical analysis of the effects of policy changes.

## 3.1 Regulatory barriers

**The Single Market in Services is hindered by**

A fundamental principle of the European Union is that goods, services, capital and labour can move freely between the Member States[38]. The internal market for goods seems to function relatively well compared to the internal market in services[39]. The providers of services experience barriers if they want to export their services to other Member States, or when they want to start a subsidiary company in other EU member states. Services constitute a large and increasing part of the EU economies and are considered to be one of the main determinants of competitiveness and growth[40]. In 2002 the European Commission[41] has concluded that the obstacles in services provision are mainly due to the *differences among national regulations* for service exporters, foreign investors in services, and for the service product itself mostly focusing on domestic purposes (so called *trade barriers*). The heterogeneity of national regulations increases trade costs and investment costs for service providers doing business in other Member States. Recent evaluations of the Member States' of the regulatory impact on the trade in services (COM, 2011, European Commission, 2012) show that there are national regulatory elements hampering the EU Single Market in services:

- Regulations on required professional qualifications of services-providing personnel;
- Regulations on legal form of the services provider;
- Regulations on capital ownership of the services provider;
- Regulations on required local insurance.

38 http://europa.eu/legislation_summaries/internal_market/index_en.htm.
39 Kox, Lejour, Montizaan (2004).
40 http://ec.europa.eu/commission_2010-2014/president/news/archives/2014/03/pdf/services_en.pdf.
41 COM (2002).

Below we present several indicators that measure the restrictiveness to competition and trade in services and allows to compare the situation in the Netherlands to other countries.

**Box 1. Measures of restrictiveness to competition and trade in services in the Netherlands**

According to this classification, the regulated professions, which are also present in the Netherlands, fall into the category regulations on required professional qualifications of service-providing personnel. The recently developed OECD Trade Restrictiveness Index[42] shows that the Netherlands is the least restrictive country among OECD countries in construction, architecture and engineering sectors, where there are no sector specific regulations though there are some professions that are regulated.[43] A different OECD indicator is the so called Product market regulation (PMR) index. This set of indicators[44] measures the restrictiveness of regulation and shows that the Netherlands scores below average in professional services. This means that regulation in these services is more conducive to competition in the Netherlands than average across OECD-countries. This can be explained by past liberalisation efforts of the Netherlands over the past 15 years which have resulted in a reduction in the overall score for professional services from 1.62 to 1.23. In engineering and architecture services the Netherlands is considered as one of the countries that is the least restrictive to competition.

**Table 3.1 Product market regulation set of indicators for professional services in the Netherlands and OECD countries**

| Year | 1998 | 2003 | 2008 | 2013 |
|---|---|---|---|---|
| Accounting services | 3.00 | 2.81 | 2.31 | 2.13 |
| *EU average* | *2.96* | *2.40* | *2.25* | *2.15* |
| *OECD average* | *2.87* | *2.25* | *2.15* | *2.08* |
| Legal services | 2.48 | 2.71 | 2.79 | 2.79 |
| *EU average* | *3.18* | *3.04* | *2.94* | *2.82* |
| *OECD average* | *3.22* | *2.91* | *2.80* | *2.74* |
| Architecture services | 0.75 | 0.75 | 0.00 | 0.00 |
| *EU average* | *1.92* | *1.78* | *1.71* | *1.56* |
| *OECD average* | *1.70* | *1.50* | *1.50* | *1.40* |
| Engineering services | 0.25 | 0.00 | 0.00 | 0.00 |
| *EU average* | *1.23* | *1.31* | *1.18* | *1.07* |
| *OECD average* | *1.19* | *1.24* | *1.16* | *1.05* |
| All professional services | 1.62 | 1.57 | 1.28 | 1.23 |
| *EU average* | *2.26* | *2.08* | *2.00* | *1.90* |
| *OECD average* | *2.22* | *1.96* | *1.88* | *1.82* |

Source: OECD.

Note: OECD average is the average of all OECD countries. EU average is an average among the following 19 countries that are present in the database: Austria, Belgium, Czech Republic, Denmark, Estonia, Finland, France, Germany, Greece, Hungary, Ireland, Italy, the Netherlands, Portugal, Slovak Republic, Slovenia, Spain, Sweden and UK.

42 http://www.oecd.org/tad/services-trade/services-trade-restrictiveness-index.htm.

43 The transport, accounting and legal services sectors seem to be the most restrictive sectors for the trade in services in the Netherlands but still less restrictive than the average of 40 countries investigated. Besides the regulations on required professional qualifications of services-providing personnel[43], there are restrictions on the share of foreign equity in transport, accounting and legal services sectors.

44 These indicators aim at measuring the degree to which policy settings promote or inhibit competition in areas of the product market where competition is viable. Thus they represent the stringency of regulatory policy in specific areas on a scale of 0 to 6 where a higher number indicates a policy stance that is deemed less conducive to competition.

## 3.2 Modernising regulation

**How to modernise the regulation in the services sector?**

This chapter discusses the existing theories and models studied in the literature that explain the impact of changes in the regulatory policy of services sector on economic and welfare outcomes (detailed overview of the studies is presented in Table 3.3). It should be stressed, however, that the literature does not state the precise effects of particular policies[45]. Nevertheless, there are general principles that lie behind amendments in regulations: consistency, transparency, accountability, targeting and proportionality. OECD (2012) distinguishes between several types of main policy categories addressing how regulation can affect the economic outcomes and welfare: regulatory policy and governance in general; administrative simplification (including reducing regulatory burdens, opening one stop shops and shortening the time for opening a business); ex ante and ex post analyses of regulations (including evidence-based analysis of new regulations and regulatory oversight bodies to ensure regulatory quality); consultation, transparency and accountability; regulatory Institutions (including independence of regulators). Following this categorisation the changes in the regulations on required professional qualifications of services-providing personnel are assessed as administrative simplification (including reducing regulatory burdens).

We have identified in the literature the following examples of changes in the regulatory environment of the services sector (modernisation of the services sector): market integration (homogeneous regulation, full implementation of Service Directive), and elimination of trade barriers and non-tariff measures to open up the services sector. All the identified examples are presented in the Table 3.3. We realise that not all of these examples are directly relevant for regulated professions in terms of the measures taken, but their effects may be similar (e.g. more competition, higher productivity).

## 3.3 Economic effects of modernising regulations

**Elimination of differences in the regulatory burden results in…**

Elimination or removal of the differences in the regulations, or barriers to service provision, would allow to experience benefits in terms of *increased employment and GDP* in the services sector. It is widely recognised that there is a positive link between the growth of services sector and the overall productivity growth[46]. Thus the modernisation or liberalisation of the services sector through elimination of the above mentioned differences in the regulations is expected to benefit the whole economy.

One of the main goals of the Services Directive is to reduce the impediments for trade in services. Moreover, further opening of the Single Market for services is a key element in the Europe-2020 plans of the European Commission (COM, 2010). The actual implementation of the Directive so far (as measured in 2012) resulted in a 0.8% increase in GDP at EU level, while additional gains could still be reaped[47] when remaining barriers hampering the creation of the Single Market in Services are removed. A study undertaken by the European Parliament[48] finds that there are potential economic gains of further deepening existing European action or undertaking new action in certain fields ("the cost of non-Europe"). The findings suggest that the cumulative efficiency gains of

[45] OECD (2012), page 10: 'For example, there is no precise "theory" of the effect of the adoption of public consultation before regulating on GDP growth. In economics there are well-developed theories on particular aspects of regulation, such as rate of return over price cap regulation in utility industries, and literature on "regulatory capture", but the discussion of other aspects of regulatory policy is arguably less one of deep theory and more one of assumptions and propositions. In particular, the economics literature appraises regulation drawing on broader economic principles to do with competitive and non-competitive markets, sometimes referred to collectively as neoclassical economics.'

[46] For example, see Maroto-Sanchez and Cuadrado-Roura (2008), Sasaki (2007), Bosworth and Triplett (2007a, 2007b).

[47] Monteagudo, Rutkowski, Lorenzani (2012), p. 8.

[48] EP (2014).

actions undertaken at the EU level[49] could represent 800 billion euro, or 6 per cent of EU GDP in current prices. These benefits are expected in case a wide-ranging policy agenda in 24 different areas is implemented. Therefore, the study is only indirectly relevant as an indication of the potential benefits of modernising regulated professions. Looking only at eliminating barriers to trade in key EU-sectors[50] (a subset of the modernisation options analysed by the study), suggests that EU GDP could increase by 1.6%[51]. Barriers to trade in these sectors include heterogeneous regulation, also including the regulated professionals in the respective sectors. Due to the wide-ranging nature of this study, we do not further discuss it below.

**Transmission channels for eliminating differences are**

The main channels through which the elimination of the differences in the regulatory burden has an impact on the economy are *international and domestic* ones. The latter one means that the reduction of the barriers results in the increased labour productivity and intensified competition in the domestic economy. The international channel includes the impact on the foreign direct investment (FDI) and trade in services (export and import) as a result of the elimination of trade barriers. Generally, there are only several methods that are widely adopted in the literature investigating the economic effects of a change in a regulatory environment: descriptive statistics analysis including correlation, cost-benefit analysis, regression analysis and simulations.

*Domestic transmission channel*

Differences in the regulatory processes and in particular differences in the extent of regulation in labour and product markets likely have an impact on employment, the degree of competition, and capital and labour productivity. Therefore these differences can in part explain differences in economic performance between countries (OECD, 2012).

For example, Nicoletti and Scarpetta (2003) and Barone and Cingano (2010) find that a reduced regulatory burden positively affects productivity levels. Blanchard and Giavazzi (2003) and Alesina et al. (2005) argue that when entry barriers to the markets are reduced, the number of companies increases, thus decreasing the mark up of prices above costs, which positively affects economic activity in the economy. Moreover, lighter regulatory burdens, for example, by opening up access to markets, boosts productivity and investment growth (Gust and Marquez, 2003; Nicoletti and Sharpetta, 2005).

*International transmission channel*

The international channel includes the impact on foreign direct investment (FDI) and trade in services (export and import) as a result of the elimination of trade barriers. When regulation becomes more burdensome for companies, e.g. entry barriers are increased, foreign direct investment can be deterred. One of the reasons for this is that the expected rate of return on such investments is lowered due to burdensome regulations[52]. FDI is positively linked to the transfer of technological knowledge, thus positively affecting economic growth. Moreover, reducing barriers to foreign direct investment in services is found to particularly increase demand for higher skilled labour. Lower tariff- and non-tariff barriers reduce the costs of imported products for consumers and provide new market opportunities for exporters (OECD, 2011).

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49 The estimation is based on the assumption that the actions are fully implemented.

50 The following sectors are included in the analysis: retail trade (sale in non-specialised stores), business services (architectural and engineering activities), accommodations (hotels), logistics (land transport of freight), wholesale trade (construction materials), construction of buildings.

51 EP (2014), p. 11.

52 The study also notes that in some cases, if FDI aims at accessing the local market, cost-increasing regulations in the host country may encourage FDI because the foreign affiliate can take advantage of the production structure of the parent firm, which may be more efficient than local firms.

Below we discuss a selection of studies that review the effects of modernisation or liberalisation mainly in the services sector. In the analysed studies the modernisation of the services sector either means that the EU Services Directive is fully implemented or the regulatory burden is reduced through both domestic and international transmission channels. Thus the coverage of the reports is wider than purely the modernisation of regulated professions which is the focus of this study. Due to the limited number of studies which are available in this area, we still discuss findings of studies analysing service sector reform.

### *3.3.1 Estimated economic effects for the Netherlands*

**Table 3.2** presents an overview of the studies with a specific focus on the effects calculated for the Netherlands. We highlight some of the key findings below.

Several studies on the Netherlands[53] highlight the fact that restrictive regulation and (thus) limited competition result in a sluggish labour productivity growth in business services in the Netherlands. Business services are an important supplier to other sectors, thus low productivity growth in this sector has an impact on the growth (potential) in other sectors. Another study (Kox, 2012) reports that a lower regulatory burden (e.g. the regulatory inflexibility is reduced), increases the intensity of competition within the country, also due to more import competition. Therefore the total efficiency in the economy is improved which positively affects GDP. The effects are analysed for a number of EU Member States in comparison with the US. For the Netherlands the effect is calculated to be the strongest when employment flexibility is increased and regulation-induced exit costs (like bankruptcy rules) are reduced.

An OECD study (Bouis and Duval, 2011) expects that targeted domestic reforms in the Netherlands over the next ten years can result in economic gains of up to 5% of GDP. The analysed reforms are broad affecting different dimensions of product and labour markets. The reforms specifically analysed in the study are the following: easing (or modernising) of product market regulation; reforming employment protection legislation, unemployment benefit systems and labour activation policies. The study also looks at labour taxes, and pension systems. Gradual reforms in a broad range of services sectors (including the professional services) could potentially boost labour productivity[54] and thus positively affect GDP. As the reforms studies are very broad, the results are only partially relevant for our study.

A number of studies also analysed the effect of a liberalisation of the services sector on the Dutch economy, for example as a result of the implementation of the Services Directive. Gelauff and Lejour (2006), CPB (2007) and De Brujin et al. (2006, 2008) have estimated that full implementation of the Commission's original Services Directive proposals of 2004 could have had the effect of a large increase in intra-EU services trade, with an economic effect in the Netherlands in a range between 0.2 and 1.4% of GDP.

Breuss and Badinger (2006) use an econometric partial equilibrium approach (unlike CPB (2007) and de Bruijn et al (2006, 2008) studies which rely on computable general equilibrium models) to estimate the impact of the implementation of the Services Directive as part of Lisbon strategy. This is again a very broad study, covering various measures. There are two main channels through which the effect is taking place: competition and productivity. Results suggest that in the Netherlands productivity and employment in the service industries covered by the Directive increase by 0.7% as a result of implementing the directive. Value added of the services covered is expected to increase by 1.4%.

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[53] See, for example, Van der Wiel et al. (2012a, 2012b); Van de Ven (2013).

[54] In case of labour market reforms, the effect is primarily on employment.

**Table 3.2 A selection of studies analysing the effects of the modernisation of the services sector in the Netherlands**

| Author(s) (year) | Title | Type of modernisation | Method | Sector | Country | Channel | Impact in the Netherlands[55] |
|---|---|---|---|---|---|---|---|
| Bousi and 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 | The domestic reforms include easing (or modernising) of product market regulation; employment protection legislation, unemployment benefit systems and activation policies, labour taxes, and pension systems. | Simulations based on the previous literature | Nonmanufacturing sectors (energy, transport, communication, retail trade, professional services and banking) | OECD<br>The Netherlands | - Labour productivity;<br>- Growth; employment rate. | Increase in NL GDP by 5%. |
| Breuss and Badinger (2006) | The European Single Market for services in the context of the Lisbon Strategy: macroeconomic effects of the Services Directive | Implementation of the Services Directive. | Econometric Partial Equilibrium | Economy-wide. | EU11 (including the Netherlands) | Increased productivity and competition. | Value added in services increases by 1.4%.<br><br>Employment in services increases by 0.7%. |
| CPB (2007) | Expected effects of the European Service Directive | Harmonisation of the MS regulation (Services Directive). | CGE model (WorldScan) | Economy-wide | EU<br>The Netherlands | Increased FDI and trade. | Increase in NL GDP by 0.3 – 1.4%. |
| De Bruijn et al. (2006, 2008) | The trade induced effects of the | Full implementation of Services | CGE model (WorldScan) | Economy-wide | EU (the Netherlands) | Increased intra-EU trade | 0.3 – 1.4% increase in NL GDP. |

[55] The results in the table are reported only for the Netherlands. If the coverage of a study is larger, it is mentioned in the next subsection.

| Author(s) (year) | Title | Type of modernisation | Method | Sector | Country | Channel | Impact in the Netherlands[55] |
|---|---|---|---|---|---|---|---|
| | Services Directive and the country of origin principle; Economic benefits of an Integrated European Market for Services | Directive. | | | | | |
| Gelauff and Lejour (2006) | The new Lisbon Strategy: An estimation of the impact of reaching five Lisbon targets | Full implementation of Services Directive. | CGE model (WorldScan). | Economy-wide | EU19 (the Netherlands) | Increased intra-EU trade | Increased NL GDP by 0.2%. |
| Kox (2012) | Unleashing Competition in EU Business Services | Reduction in regulatory burden (increased import openness, reduced regulatory employment inflexibility, less regulatory start-up and exit costs) in comparison with the best-practice. | Regression analysis, Simulation. | Business services | EU (the Netherlands) | Intensified competition (internationally) | Around 2.5% increase in productivity in the Netherlands (on average for EU 3.5% increase in efficiency). |
| Van de Ven (2013) | Onbenut groeipotentieel in grote delen van de economie | Adoption of existing technologies and techniques from the countries that have higher labour productivity. | Comparison with best practices around the world. | Construction, energy and utilities and business services | The Netherlands | Intensified competition (internationally) | Growth of labor productivity of 0.5 percentage point per year |
| Van der Wiel et al. (2012a, 2012b) | Nederlandse zakelijke | Deregulation of the credit market, | An econometric analysis (semi | Business services | The Netherlands | Intensified competition in the | Deregulation boosts labour |

| Author(s) (year) | Title | Type of modernisation | Method | Sector | Country | Channel | Impact in the Netherlands[55] |
|---|---|---|---|---|---|---|---|
| | dienstverleners onvoldoende geprikkeld; Hogere productiviteit onder zakelijke dienstverleners door meer concurrentie | labour market | endogenous growth model) | | | sector | productivity growth |

In short, studies discuss different channels through which the modernisation in the services sector might affect GDP. Studies, however, are not directly comparable due to different approaches, scoping and time spans. According to the studies that calculate the impact of modernisation as implementation of the Services Directive the range of the effect is in between 0.2 and 1.4% when CGE models are used.

In the next section we will present a selection of studies that analyse and quantify the effect of modernisation of the services sector for the whole European Union or for other Member States.

### *3.3.2 Estimated EU-wide economic impact*

This section discusses a selection of studies that quantify the effects of modernisation or liberalisation mainly in the services sector in the EU or in a selection of Member States. In the analysed studies the modernisation of the services sector mainly means an adoption of the Services Directive. **Table 3.3** presents an overview of the studies.

Generally, studies assessing the economic impact of liberalising the services sector followed the approach of, first, identifying the existing barriers to the provision of services, and, secondly, assessing the impact of the their elimination. As noted before, the implementation of the Services Directive has a much broader impact than a modernisation of the regulation of regulated professions would have. Moreover, studies use different techniques and scopes of analyses. As a result, they are not directly comparable.

Several CPB studies[56] have analysed the impact of existing barriers to the cross-border provision of services. They use a computable general equilibrium model covering most of the EU countries. The results[57] suggest that GDP could rise up (in the range between 0.3% and 0.7% in the long run by 2040) if the EU reaches all the strategies set in Lisbon Strategy (thus the administrative costs will be reduced and the service market will be fully open). This is however a lower bound of the increase as the model does not include FDI. Lejour et al. (2007, 2008) also analyse the effect of the implementation of the Services Directive mainly through the FDI channel. It was found that FDI in services could increase by 20-35% thus increasing GDP in EU25 by 0.4 – 0.8%. Kox et al. (2004)[58] show that the trade in commercial services might increase by 30-60% when the intra-EU heterogeneity in product market regulation for services is reduced due to the implementation of the Service Directive. When the two channels (intra-EU trade in services and FDI) are combined, the increase in EU GDP is in the range between 0.4 – 1.5%. The main conclusion of these studies is that not only the degree of competition but also the heterogeneity in the regulations across EU countries matters. These estimates however include the CoOP[59] which accounts for a third of the calculated gains. These studies do not take into account the changes introduced during the legislative process. If the CoOP principle is excluded, the intra-EU trade in services could increase by 20-40% positively affecting the GDP (by 0.2 – 0.4% compared to 0.3 – 0.7%)[60].

Two other studies, Copenhagen Economics (2005a, 2005b) used a computable general equilibrium model to predict that EU-wide[61] benefits of elimination of trade in services barriers could result in increased total employment by 0.3% and employment in services by 0.5%. Through the intensified

[56] CPB (2007), Gelauff and Lejour (2006), De Bruin et al. (2006, 2008).
[57] Gelauff and Lejour (2006), De Bruin et al. (2006, 2008).
[58] The estimations and simulation are based on the gravity model covering 14 'old' EU countries.
[59] The Country of Origin Principle guaranteed that member states could no longer impose their own regulatory requirements on service providers from other EU member states if these service providers had already complied with the regulatory requirements in their country of origin.
[60] De Bruijn et al. (2006, 2008).
[61] Here EU is covered by EU25.

competition, (reduction in prices) and increased productivity, GDP would increase by 0.6%. If the CoOP principle is excluded, the benefits in welfare gains are around 8% smaller. Using similar approach, Ilzkovits et al. (2007) and Decreux (2012) find that completion of the Single Market in services sector will result in increased intra-EU trade thus boosting EU GDP on average by 5%.

Breuss and Badinger (2006), on the other hand, use an econometric partial equilibrium approach to estimate the impact of the Lisbon strategy. This is again a very broad study, covering various measures. The findings suggest that the GDP of 11 EU counties will increase by 0.7%. There are two main channels through which the effect is taking place: competition and productivity.

Badinger et al. (2008) builds on the Breuss and Badinger (2006) study estimating the effect of the elimination of the barriers to FDI in services sector (as a best case scenario). Elimination of barriers results in gains in the GDP by 0.7% via the trade channel and by 0.8% via the FDI channel, or total increase by 1.5%. If the CoOP principle is excluded from the analysis the gains in GDP will be 1%.

PWC and London Economics (2012) estimates the effect of further market integration (removal of barriers to cross-border activities and homogeneous regulation) on the overall economic performance and shows that when regulatory requirements are homogeneous among other things specific for the sectors analysed the EU27 GDP will increase by 1.6%.

In short, the studies calculating the effects of modernisation in the services sector point towards significant economic benefits, but the size and transmission channels differ per study as well as the scope and method of estimations. According to the studies that calculate the impact of modernisation as implementation of the Services Directive the range of the effect is in between 0.5 and 1.5%[62].

[62] This range is calculated for the studies that use similar approaches and similar time periods thus allowing to make a direct comparison of the results. European Commission (2012) comes to the same conclusion about the range of predicted effect of implementation of the Services Directive.

**Table 3.3. A selection of studies analysing the effects of the modernisation of the services sector for EU**

| Author(s) (year) | Title | Type of modernisation | Method | Sector | Country | Channel | Impact on EU economy |
|---|---|---|---|---|---|---|---|
| Alesina et al. (2005) | Regulation and investment | Liberalisation reforms (especially affecting the entry to the market). | Theoretical model; Regression analysis. | Transport, communication and utilities industries. | OECD | Changes in the mark-up of prices over marginal costs; changes in the costs of adjusting the capital stock. | Tight regulation of product markets has a negative effect on investment activity. |
| Arnold et al. (2011) | Does services liberalization benefit manufacturing firms?: Evidence from the Czech Republic | Opening services sectors to foreign providers (elimination of barriers to foreign investment in services sectors). | Econometric Partial Equilibrium. | Manufacturing sector. | Czech Republic | Intermediate inputs from services industries. | labor productivity increase by 43.6%. |
| Barone and Cingano (2010) | Service regulation and growth: evidence from OECD countries | Liberalisation of regulation in energy, telecommunication, transportation and professional services. | Regression analysis based on Input-Output Matrix of Accounts. | | | | Professional service-intensive sectors: growth rate is 0.5%-point higher compared to non intensive user industry. |
| Blanchard and Giavazzi (2003) | Macroeconomic effects of regulation and deregulation in goods and labor markets | Product and labour market deregulation. | CGE (theoretical model). | Total economy | -- | Changes in the mark-up of prices over marginal costs. | Decline in a number of incumbent firms; unemployment may increase in a short term. |
| Badinger et al. (2008) | Macroeconomic effects of the Services Directive | Implementation of the Services Directive. | Econometric Partial Equilibrium. | Economy-wide | EU11 | Increase in FDI flows and trade. | Increase in EU GDP by 1.5%. |

| Author(s) (year) | Title | Type of modernisation | Method | Sector | Country | Channel | Impact on EU economy |
|---|---|---|---|---|---|---|---|
| Bousi and 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 | The domestic reforms include easing (or modernising) of product market regulation; employment protection legislation, unemployment benefit systems and activation policies, labour taxes, and pension systems. | Simulations based on the previous literature. | Nonmanufacturing sectors (energy, transport, communication, retail trade, professional services and banking). | OECD | Labour productivity Growth; employment rate. | Increase in GDP by 5 –.<br><br>11% for the average EU country. |
| Breuss and Badinger (2006) | The European Single Market for services in the context of the Lisbon Strategy: macroeconomic effects of the Services Directive | Implementation of the Services Directive. | Econometric Partial Equilibrium. | Economy-wide | EU11 | Increased productivity and competition | Value added in services increases by 0.7%.<br><br>Employment in services increases by 0.85%. |
| Copenhagen Economics (2005a)[63] | Economic Assessment of the Barriers to the Internal Market for Services | Elimination of trade barriers (Full implementation of the Services Directive). | CGE model. | Services sector: accountancy, retail trade, wholesale trade and IT-services. | EU | Intensified competition (reduction in prices) Increased productivity. | Intra-EU trade in services increases by 5%.<br><br>Total employment increase by 0.3%. |

[63] In their later study, Copenhagen Economics (2005b), the CoOP (country of origin principle) was excluded, thus the GDP gains are 7-9% lower than that of the earlier study. This principle guaranteed that member states can no longer impose their own regulatory requirements on service providers of other EU member states if these service providers had already complied with the regulatory requirements in their country of origin.

| Author(s) (year) | Title | Type of modernisation | Method | Sector | Country | Channel | Impact on EU economy |
|---|---|---|---|---|---|---|---|
| | | | | | | | Employment in services increases by 0.5%.<br><br>GDP increases by 0.6%<br><br>Value added in services increases by 1.1% |
| CPB (2007) | Expected effects of the European Service Directive | Harmonisation of the MS regulation (Services Directive). | CGE model (WorldScan). | Economy-wide | EU | Increased FDI and trade. | Increase in EU GDP by 0.2 - 0.4%. |
| Decreux (2012) | Completing Single Market II | Elimination of trade barriers | CGE model | Economy wide | EU | Intra-EU trade | Increase in EU GDP by 8% on average via an increase in exports by $12.2 trillion. |
| EP (2014) | Mapping the Cost of Non-Europe, 2014 -19 | - 'Growth without debt';<br>- Digital single market;<br>- Harmonisation of private international law/simplification of public documents. | Literature review | Economy wide | EU | - Digital Single Market – 260 bln.;<br>- Completing financial markets – 60 bln.;<br>- Banking Union to avert a new financial crisis – 35 bln.; | Increase in EU GDP by 6%. |

| Author(s) (year) | Title | Type of modernisation | Method | Sector | Country | Channel | Impact on EU economy |
|---|---|---|---|---|---|---|---|
| | | | | | | - Minimum Unemployment Insurance Scheme 15 bln.;<br>- Improved coordination of fiscal policies 31 bln.;<br>- Commmon Deposit Guarantee Scheme 30 bln.;<br>- Transatlantic Trade Agreement 60 bln.;<br>- Single Market for Citizens and Consumers 235 bln.;<br>- Equal pay for equal work 13 bln.;<br>- Integrated Energy Markets 50 bln.;<br>- Common Security and Defence 26 bln.;<br>- Combating | |

| Author(s) (year) | Title | Type of modernisation | Method | Sector | Country | Channel | Impact on EU economy |
|---|---|---|---|---|---|---|---|
| | | | | | | Violence against Women 7 bln.;<br>- VAT and action against Tax Evasion 7 bln.;<br>- Information and consultation of workers 3 bln.;<br>- - Single European Transport Area 5 bln. | |
| Gelauff and Lejour (2006) | The new Lisbon Strategy: An estimation of the impact of reaching five Lisbon targets | Reduction in the administrative costs.<br><br>Opening up the services market. | CGE model (WorldScan). | Economy-wide | EU19 | Increased labour productivity.<br><br>Increased intra-EU trade. | Increased intra-EU trade by 30-60%.<br><br>Increased EU GDP by 0.3-0.7%. |
| Gust and Marquez (2003) | International Comparisons of Productivity Growth: The Role of Information Technology and Regulatory Practices | Changes in the regulatory environment (measured as indexes of employment protection legislation, regulatory burdens on start-ups and overall regulatory burden). | Regression analysis. | Network services (IT sector). | 13 countries including some of EU MS and US | Diffusion of information technology. | Lighter regulatory burden slows down the productivity growth. |

| Author(s) (year) | Title | Type of modernisation | Method | Sector | Country | Channel | Impact on EU economy |
|---|---|---|---|---|---|---|---|
| Ilzkovits et al (2007) | Steps Towards a Deeper Economic Integration: the Internal Market in the 21st Century, A Contribution to the Single Market Review | Full implementation of the Single Market (removal of non-tariff barriers to trade and cross-border activities). | Dynamic stochastic general equilibrium model. | EU-wide Services sector (retail trade, network industries, financial services). | EU15 | Intra-EU trade (competition and innovation). | Increase in GDP by 2.2%.<br><br>Increase in employment by 1.4%. |
| Kox (2012) | Unleashing Competition in EU Business Services | Decrease regulation costs and increase import openness. | Econometric Partial Equilibrium. | Business services | EU<br>Firm level | Increased competition. | Efficiency gains up to 7%. |
| Nicoletti and Scarpetta (2003) | Regulation, Productivity, and Growth | Liberalisation and privatisation reforms (e.g. reducing entry costs). | Regression analysis. | Manufacturing and services sectors | OECD | Intensified competition; knowledge spillovers. | Positive link between the liberalisation and productivity. |
| OECD (2011) | The impact of Trade Liberalisation on Jobs and Growth: Technical Note | Elimination of trade barriers[64]. | CGE model | The whole economy. | G20<br>Euro area | Increases in FDI and employment. | Increased employment by 0.3-3.9%.<br><br>Increased exports by 10% in euro area. |
| PWC and London Economics (2012) | Study on the cost of non-Europe: the untapped potential of the European Single Market | Market integration (removal of barriers to cross-border activities; homogeneous regulation). | Analysis of performance gaps (with US) in productivity EU KLEMS. | - Retail trade (sale in non-specialised stores);<br>- Business services | EU27 wide | Depends on the sector.<br><br>For all the sectors:<br>- Heterogeneity of regulatory | Value-added increase in the six sectors by 5.3%<br>Increase in EU27 GDP by 1.6% (long term). |

[64] The suggested reforms are of "behind-the-border regulations", such as recognition of equivalent foreign qualifications, standards, and harmonizing and simplifying licensing systems.

| Author(s) (year) | Title | Type of modernisation | Method | Sector | Country | Channel | Impact on EU economy |
|---|---|---|---|---|---|---|---|
| | | | | (architectural and engineering activities);<br>- Accommodation (hotels);<br>- Logistics (land transport of freight);<br>- Wholesale trade (construction materials);<br>- Construction of buildings. | | requirements;<br>- Labour inflexibility. | |

## 3.4 Economic benefits of modernisation for the Dutch economy

As discussed above, the recent literature considerably debates the effect of the modernisation of the services sector on the economy. The studies conclude that there is a positive relationship between liberalisation or modernisation of the service sector and GDP. However, the exact effects of the modernisation vary substantially. Data availability plays a role in the choice of the appropriate method to analyse effects. The majority of the literature suggests that effects of services sector modernisation can be significant.

As the studies surveyed have a different scope and do not cover modernisation of regulated professions in the Netherlands, it is not possible to use these to obtain an indication of the economic impact of such reforms in the Netherlands. The surveyed studies do point out a range of potential benefits of service sector reform of up to 8% of GDP. We believe the impact of reform in regulated professions would be significantly smaller for a number of reasons. First, the level of ambition of the other Member States for modernising their regulated professions is at this point not clear. If modernisation in the Netherlands is a unilateral measure, this would exclude benefits of other countries also undertaking reforms. Secondly, regulated professions is a much narrower group of services than those represented by the service sector as a whole. Finally, it is likely that broader reforms will create synergies compared to more narrowly targeted reforms, again reducing the expected economic impact of reforming regulated professions. Therefore, we think a lower bound estimate is appropriate.

To obtain a rough indication of the potential effect of modernising regulated professions in the Netherlands, we use the literature discussed above as a starting point. As noted in the previous section, the majority of the literature on the Netherlands finds an expected impact of between 0,2 and 1,4% of GDP of services sector modernisation. The studies that focus on the implementation of the Services Directive find an expected impact of 0,5-1,5% of EU GDP. Given that the reforms analysed are generally wider in scope than a modernisation of regulated professions, the results of these studies can only be seen as an indication that a positive economic impact can be expected. No robust indications of the size of the potential impact of modernising regulated professions in the Netherlands are available.

To still provide an illustration of the potential economic impact in the Netherlands, we assume that a lower bound of the estimates discussed above is a relevant starting point, which is an expected benefit of 0,5% of GDP. However, this is an impact that holds for reforms of the service sector as a whole, whereas we are studying regulated professions, which is only part of the services sector. To calculate an indication for regulated professions modernisation, we assume the effect is proportional to the lower bound estimate of 0,5% of GDP for services sector reform. In the previous chapter we calculated the share and economic contribution of the regulated professions in the Netherlands. Given the share of regulated professions in the Dutch economy and the average impact of modernisation measures in the services sector, we expect an annual benefit of 0.06-0.1%[65] for the Dutch economy as a whole due to modernising regulations of regulated professions. This can be seen as the structural impact after all modernisation measures have taken full effect.

In order to calculate the economic benefit of modernisation in regulated professions in the next ten years, we also need to make an assumption about the time required before any modernisation

[65] This number is calculated as follows. Based on the available studies on the growth of GDP due to the modernization of the services sector, we assume that a proportional improvement in GDP can take place due to modernising regulated professions. A lower bound estimate of the GDP-growth that is expected due to services sector regulation modernization is 0,5% of GDP. We assume that GDP will grow at the same rate when regulated professions are modernized only correcting for the fact that regulated professions contribute to GDP in a range 8.7-14.3% and the services sector represents 74% of the total economy. The estimate of the effect on GDP due to modernization of the regulated professions is in the range between 0.06% (=8.7/74*0.5%) and 0.1% (=14.3/74*0.5%).

measures reach their full impact on the market. We assume that the full effect is reached within three years after the implementation of modernisation measures. Given a growth path of 3 years before the full yearly benefit reached[66], the net present value of the economic impact over a period of 10 years is 2.3 – 3.8 bln. euro's[67].

There are important caveats to the above high level illustrative analysis. First, we note that effects on GDP may be an end result of modernisation measures, but many intermediate effects are also potentially relevant. For example, modernisation measures such as a lowering of the administrative burden can also lead to a higher productivity by working more efficient. Another effect is that modernisation will lead to more cross-border migration in regulated professions resulting in more competition, more efficient and innovative input of labour and a better fit between supply and demand on the labour market (quality) and service market (costs). These are important benefits which are only partly measured by GDP.

Moreover, any potential modernisation of regulated professions should be carefully assessed to avoid negative or unintended potential side-effects, for example on the quality of the services provided. These potential negative effects have not been taken into account in the above illustrative calculations.

Finally, we note that any benefits of modernising regulated professions may at least in part depend on the implementation of accompanying measures. Such accompanying measures may relate to regulations at company level (e.g. administrative obligations or national standards that need to be met before activities in a certain sector may be undertaken). The expected benefits also depend on measures taken in EU-countries outside the Netherlands. If all EU-countries modernise their regulated professions, additional benefits are expected because the reforms have impact on a larger market. Therefore, when assessing the impact of reforms in regulated professions, we advise to assess the whole "regulatory" environment for these services activities, to ensure any modernisation of the regulation of regulated professions bears full fruit.

### Suggestions for further research

Due to the lack of accurate and in-depth data on regulated professions we have not been able to take any specific modernising measures into account to get an indication of the economic impact. In order to get a better understanding of the economic mechanisms and the potential impacts that can be expected, we recommend to conduct a number of case studies. These case studies should analyse different types of regulated professions and different types of regulations (e.g. licensing based on qualifications, protected titles, and mandatory certification). This would help to get a better indication of the ranges of possible impacts possible as a result of modernisation. Typical barriers that hamper competition and productivity improvements should be identified and (realistic) modernisation measures should be formulated. This could also be done in consultation with representatives of these sectors. This would provide a more accurate calculation/analyses of modernising the regulated professions, potentially also including more qualitative (non-quantifiable) effects. Another possibility would be to compare the Netherlands to a country where some professions are not regulated, for example Denmark, where an architect is not a regulated profession. The analysis could on one hand focus on the way how public interests are safeguarded in the absence of regulation. On the other hand, the focus could be on differences in outcomes between the countries (productivity, prices, quality). This type of analysis therefore also provides useful information on the potential for reform and its impact. The analysis could be focused on sectors and countries which have relatively high productivity levels.

[66] Thus the full effect is realized in the fourth year. The annual effects are discounted using a 2.5% discount rate. As a sensitivity check, using a 3.5% discount rate changes the net economic impact to 2.2-3.5 billion.

[67] The exact calculation is presented in Annex 3, Table A.3.5.

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# Annex 1. Description of the input-output model

In particular, we are interested in the effects that regulated professions have on the whole economy. First, we calculate how much every sector affects the economy and secondly the impact of the regulated professions on the sector of economic activity they are involved in. The sum of this effects shows how much overall the people being occupied in the regulated professions produce added value to the economy.

The assessment of spillover effects shows the extent of inter-linkages between and within the sectors of economic activity. The purpose is to show how the presence of a regulated profession in the sector may indirectly affect other sectors.

In order to calculate the spillover effects and the value added generated within the sectors and to other sectors we use the input-output tables. It is a quantitative economic technique that represents the interdependencies between different sectors of a national economy. This technique allows to calculate how output from one economic sector may become an input to another sector.

An input-output table for the whole economy of the Netherlands consists of rows[68] (sectoral output, sales) and columns[69] (sectoral inputs, purchases).

The following table illustrates the input-output table structure.

| | | Intermediate Demand | | | | | |
|---|---|---|---|---|---|---|---|
| | **Sectors** | **Landbouw** | **Bosbouw** | **Visserij** | **Winning van aardolie en aardgas** | **Final Demands** | **Total Output** |
| Intermediate Input | Landbouw | 4 255 | – | – | 4 | | =sum by row |
| | Bosbouw | – | 2 | – | – | | |
| | Visserij | – | – | – | – | | |
| | Winning van aardolie en aardgas | – | – | – | 306 | | |
| | Delfstoffenwinning (geen olie en gas) | 11 | – | – | – | | |
| | Voedingsmiddelenindustrie | 4 201 | – | – | – | | |
| Primary Inputs | Value Added | | | | | | |
| **Total Inputs** | | **=sum by column** | | | | | |

[68] The sum of the intermediate demand in the row is equal to the gross value of the production.

[69] The sum of the intermediate demand in the column together with the value added (total inputs) is also equal to the gross value of the production of an industry (total outputs).

Input-output analysis is an economic tool that is based on a fixed-coefficient linear production function that relates the inputs used by a sector or industry to sectoral outputs.

In the Input Coefficient matrix A each element indicates how much output of a sector is used as input in production of each unit of a different sector. The input coefficients are calculated as a share of the input from one sector goes to a different sector in total output of the different sector.

Writing x for the vector of industry gross outputs, d for the vector of demand for final goods, then the basic relation between output and final demand can be expressed as:
*d =(I-A) x, or alternatively, x = (I-A)-1 d,* where I is the nxn identity matrix.

In this equation (I-A)-1 = B is the Inverse Leontief Matrix of the input-output coefficients and describes how many units of an industry's output have to be produced at any stage of the value chain in order to produce one unit for final demand.

The importance of any sector in the economy can be estimated by examining the inter-industry linkage effects. A sector usually uses inputs from other industries in its production process. On the other hand, when a sector supplies inputs to other industries (sectors), the dependence of these sectors on inputs supplied from that particular originating sector indicates the multiplier or spillover effect of production.

This measure of the multiplier effect includes not only the value of direct inputs that from sector i to sector j (which are the aij), but it also includes the value of other indirect inputs that originate from sector i and whose effect ends at sector j via other intersectoral transfers through the network of inputs and outputs. The values of λij are derived from the elements inverse Leontief matrix bij as follows:
*λij = bij/ bii (i ≠ j), λii = (bii – 1)/ bii*

We can show that:
*aij <= λij <= bij for all sectors i, j = 1, 2,. . . n.*

In other words, the results obtained by using λij (elements of a corresponding matrix Λ) will represent a conservative estimate of multiplier effects as compared to the commonly used values of bij.

# Annex 2. Matching sectors and regulated professions

Correspondence between the industrial classification and regulated professions.

**Table A.2.1 Correspondence between the industrial classification and regulated professions**

| Sector | Industry code | Name of the industry | Regulated profession (english) | Regulated profession (dutch) |
|---|---|---|---|---|
| Agriculture, forestry, mining | 1 | Agriculture | Field crop and vegetable growers | Beheerder landbouwspuitbedrijf |
| | | | | Uitvoerder gewasbescherming |
| | | | Fumigators and other pest and weed controllers | Bedrijfsvoerder gewasbescherming |
| | | | | Toepasser van gewasbeschermingsmiddelen |
| | | | Poultry producers | Houder van vleeskuikens |
| | 3 | Fishing | Ships' Deck Officers and Pilots | Stuurman iv visvaart |
| | | | Ships' engineers | Scheepswerktuigkundige a |
| | | | | Scheepswerktuigkundige b |
| | | | | Scheepswerktuigkundige C |
| | | | | Stuurman werktuigkundige v visvaart |
| | | | | Werktuigkundige iv visvaart |
| | 9 | Mining support service activities | Specialist Medical Practitioners | Duikmedische begeleider |
| | | | | Underwater Divers |
| | | | | Duiker |
| Construction | 43 | Specialised construction activities | Building and related electricians | Installateur alarmapparatuur |
| | | | Construction supervisors | Sloopdeskundige asbest |
| | | | | Toezichthouder asbestverwijdering |
| | | | Crane, Hoist and Related Plant Operators | Kraanmachinist |
| | | | Shotfirers and blasters | Springmeester |

| Sector | Industry code | Name of the industry | Regulated profession (english) | Regulated profession (dutch) |
|---|---|---|---|---|
| Wholesale and retail | 45 | Sale and repair of motor vehicles, motorcycles and trailers | Motor vehicle mechanics and repairers | Keurmeester periodieke keuring lichte voertuigen |
| | 46 | Wholesale trade (no motor vehicles and motorcycles) | Commercial sales representatives | Distributeur bestrijdingsmiddelen |
| | | | Fumigators and other pest and weed controllers | Distributeur gewasbeschermingsmiddelen |
| Transport | 49 | Land transport | Motor vehicle mechanics and repairers | Keurmeester periodieke keuring (zware) voertuigen |
| | 50 | Water transport | Ships' Deck Officers and Pilots | Certificaat-loods |
| | | | | Eerste stuurman voor de grote handelsvaart |
| | | | | Kapitein grote handelsvaart |
| | | | | Maritiem officier |
| | | | | Register-loods |
| | | | | Stuurman kleine handelsvaart |
| | | | | Tweede of derde stuurman voor de grote handelsvaart |
| | | | Ships' engineers | Motordrijver |
| | 51 | Air transport | Air Traffic Controller | Luchtverkeersleider |
| | 52 | Warehousing and support activities for transportation | Specialist Medical Practitioners | Duikerarts |
| | | | Underwater Divers | duikploegleider |
| Financial services | 64 | Financial institutions, except insurance and pension funding | | Werknemer en ander natuurlijk persoon die zich onder verantwoordelijkheid van een financiëledienstverlener bezighoudt met het adviseren van financiële producten aan consumenten of cliënten. |
| Business services | 69 | Legal and accounting activities | Accountants | Accountant - administratieconsulent |
| | | | | Registeraccountant |
| | | | Lawyers | Advocaat |
| | | | Legal and related | Gerechtsdeurwaarder |

| Sector | Industry code | Name of the industry | Regulated profession (english) | Regulated profession (dutch) |
|---|---|---|---|---|
| | | | associate professionals | |
| | | | | Octrooigemachtigde |
| | | | Legal professionals not elsewhere classified | Gerechtsauditeur |
| | | | | Griffiers en substituur-griffiers |
| | | | | Kandidaat-gerechtsdeurwaarder |
| | | | | Kandidaat-notaris |
| | | | Personnel and careers professionals | Arbeids- en organisatiedeskundige |
| | 71 | Architects, engineers and technical design and consultancy; testing and analysis | Building Architect | Architect |
| | | | | Architect (verworven rechten) |
| | | | Landscape Architects | Tuin- en landschapsarchitect |
| | | | Mechanical engineering technicians | Gasdeskundige tankschepen |
| | | | Regulatory government associate professionals not elsewhere classified | Monsternemer mestoffenwet |
| | | | Town and Traffic Planners | Stedenbouwkundige |
| | 72 | Research and development | Biologists, Botanists, Zoologists and Related Professionals | Biotechnicus |
| | | | Chemists | Klinisch chemicus |
| | | | Environmental and occupational health and hygiene professionals | Toezichthoudend stralingsdeskundige |
| | 74 | Other professional, scientific and technical | Building Architect | Bedrijfshulpverlener |
| | | | | Interieurarchitect |
| | | | Translators, Interpreters | Beëdigd tolk |

| Sector | Industry code | Name of the industry | Regulated profession (english) | Regulated profession (dutch) |
|---|---|---|---|---|
| | | activities | and Other Linguists | |
| | 75 | Veterinary activities | Medical assistants | Verzorger embryo-/eicelwinning |
| | | | | Verzorger embryotransplantatie |
| | | | Pet groomers and animal care workers | Proefdierverzorger |
| | | | Specialist Medical Practitioners | Keurmeester post mortem keuring |
| | | | Veterinarians | DIERENARTS |
| | | | | Dierenfysiotherapeut |
| | | | Veterinary Technicians and Assistants | Dierenartsassistent (paraveterinair) |
| | | | | Paraveterinair embryo-transplanteur |
| | | | | Taxidermist |
| | 80 | Security and investigation activities | Police Inspectors and Detectives | Particulier rechercheur (detective) |
| | | | Security guards | Particulier beveiliger |
| | 81 | Services to buildings and landscape activities | Hunters and trappers | Mollen- en woelrattenbestrijder |
| Network services | 35 | Electricity, gas, steam and air conditioning supply | Mechanical engineering technicians | Lpg-technicus |
| Public administration and defence | 84 | Public administration, public services and compulsory social security | Archivists and Curators | Bewaarder van het kadaster en de openbare registers |
| | | | Firefighter | Alle brandweerberoepen niet zijnde brandweerofficier |
| | | | Judges | Ledenopenbaar ministerie (advocaten-general, procureur-general, officieren van justitie en hun plaatsvervangers) |
| | | | | Rechters (presidenten, vice-presidenten, raadsheren)van kantongerechten,arrondisse-mentsrechtbanken,gerechtshoven,hogeraadle den openbaar ministerie(adv.gen, procureurs-generaal,officieren van justitie en hun plaatsvervangers), gerechtsauditeurs |
| | | | Police Inspectors and | Inspecteur van politie (officier) |

| Sector | Industry code | Name of the industry | Regulated profession (english) | Regulated profession (dutch) |
|---|---|---|---|---|
| | | | Detectives | |
| | | | Police officer | Medewerker basispolitiefunctie (agent) |
| | | | | Surveillant van politie |
| | | | Senior government officials | Brandweerofficier |
| | | | | Opzetter van projecten en procedures |
| Education | 85 | Education | Driving Instructors | Rij-instructeur |
| | | | Early Childhood Teachers | Beroepskracht voorschoolse educatie |
| | | | Primary School Teachers | Leraar basisonderwijs |
| | | | Secondary Education Teachers | Leraar voorbereidend wetenschappelijk onderwijs/algemeen voortgezet onderwijs/voorbereidend beroepsonderwijs (vwo, havo, vmbo) |
| | | | Special needs teachers | Leraar (voortgezet) speciaal onderwijs |
| | | | University and higher education teachers | Docent hoger beroepsonderwijs |
| | | | | Docent hoger pedagogisch onderwijs |
| | | | | Leraar hoger onderwijs |
| | | | Vocational Education Teachers | Docent beroepsonderwijs en volwasseneneducatie, bve |
| | | | | Leraar sector educatie en beroepsonderwijs (voorheen leraar middelbaar beroepsonderwijs) |
| Health and social activities | 86 | Human health activities | Audiologists and Speech Therapists | Logopedist |
| | | | Biologists, Botanists, Zoologists and Related Professionals | Medische microbiologie |
| | | | Dental assistants and therapists | Mondhygiënist |
| | | | Dentists | Specialised dentist (Oral surgery) |
| | | | | Specialised dentist (Orthodontics) |

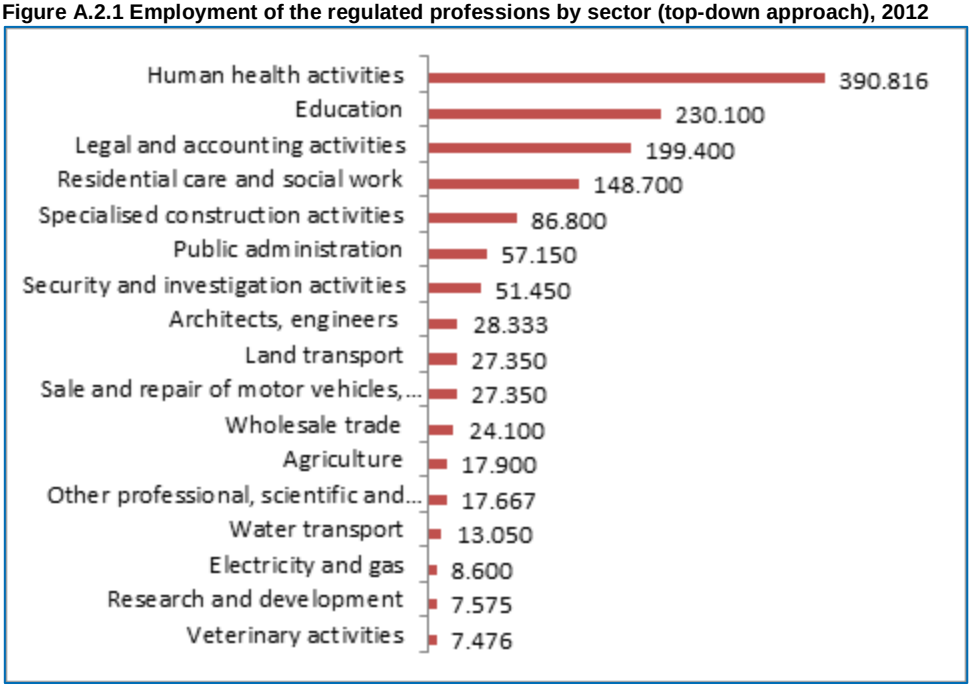
| Sector | Industry code | Name of the industry | Regulated profession (english) | Regulated profession (dutch) |
|---|---|---|---|---|
| | | | | Tandarts |
| | | | Dieticians and Nutritionists | Diëtist |
| | | | Environmental and occupational health and hygiene professionals | — Arbeid en gezondheid, bedrijfsgeneeskunde<br>— Arbeid en gezondheid, verzekeringsgeneeskunde |
| | | | | Arbeidshygiënist |
| | | | | Coördinerend stralingsdeskundige |
| | | | Environmental and occupational health inspectors and associates | Veiligheidskundige |
| | | | Generalist Medical Practitioners | Basic medical training - Netherlands |
| | | | | Heelkunde |
| | | | | Huisarts |
| | | | Health Care Assistants | Verzorgende individuele gezondheidszorg (formerly ziekenverzorgende) |
| | | | Health professionals not elsewhere classified | Ergotherapeut |
| | | | | Huidtherapeut |
| | | | | Podotherapeut |
| | | | Medical and dental prosthetic technicians | Tandprotheticus |
| | | | Medical and Pathology Laboratory Technicians | Radiotherapeutisch laborant/ radiodiagnostisch laborant |
| | | | Midwifery Professionals | Verloskundige |
| | | | Nursing professionals | Orthopedie |
| | | | | Verpleegkundig Specialist acute zorg bij somatische aandoeningen |
| | | | | Verpleegkundig Specialist chronische zorg bij somatische aandoeningen |

| Sector | Industry code | Name of the industry | Regulated profession (english) | Regulated profession (dutch) |
|---|---|---|---|---|
| | | | | Verpleegkundig Specialist geestelijke gezondheidszorg |
| | | | | Verpleegkundig Specialist intensieve zorg bij somatische aandoeningen |
| | | | | Verpleegkundig Specialist preventieve zorg bij somatische aandoeningen |
| | | | | Verpleegkundige |
| | | | Optometrists and Ophthalmic Opticians | Optometrist |
| | | | | Orthoptist |
| | | | Pharmaceutical Technicians and Assistants | Apothekersassistent |
| | | | Pharmacists | Apotheker |
| | | | | Ziekenhuisapotheker |
| | | | Physicists and astronomers | Klinisch fysicus |
| | | | Physiotherapists | Fysiotherapeut |
| | | | | Oefentherapeut-cesar |
| | | | | Oefentherapeut-mensendieck |
| | | | Physiotherapy technicians and assistants | Heilgymnast – masseur |
| | | | Specialist Medical Practitioners | Allergologie (until 12 August 1996) |
| | | | | Anesthesiologie |
| | | | | Cardiologie |
| | | | | Cardio-thoracale chirurgie |
| | | | | Dermatologie en venerologie |
| | | | | Interne geneeskunde |
| | | | | Keel-, neus- en oorheelkunde |
| | | | | Kindergeneeskunde |
| | | | | Klinisch neuropsycholoog |
| | | | | Klinisch psycholoog |
| | | | | Klinische genetica |
| | | | | Klinische geriatrie |
| | | | | Longziekten en tuberculose |
| | | | | Maag-darm-leverziekten |
| | | | | Medisch nucleair werker |
| | | | | Neurochirurgie |

| Sector | Industry code | Name of the industry | Regulated profession (english) | Regulated profession (dutch) |
|---|---|---|---|---|
| | | | | Neurologie |
| | | | | Nucleaire geneeskunde |
| | | | | Obstetrie en Gynaecologie |
| | | | | Oogheelkunde |
| | | | | Pathologie |
| | | | | Plastische Chirurgie |
| | | | | Psychiatrie |
| | | | | Psycholoog, gezondheidszorg- |
| | | | | Psychotherapeut |
| | | | | Radiologie |
| | | | | Radiotherapie |
| | | | | Reumatologie |
| | | | | Revalidatiegeneeskunde |
| | | | | Stralingsarts |
| | | | | Urologie |
| | | | | Zenuw- en zielsziekten |
| | | | | Maatschappij en gezondheid |
| | 87 | Other residential care activities | Building Caretakers | Beheerder bedrijfsinrichting, asiel of pension |
| | 88 | Social work activities without accommodation | Child Care Workers | Beroepskracht bij een kindercentrum / peuterspeelzaal |
| Entertainment | 90 | Creative, arts and entertainment activities | Shotfirers and blasters | Vuurwerkdeskundige |
| | 91 | Libraries, archives, museums and other cultural activities | Archivists and Curators | Rijksarchivaris |
| | | | | Rijksarchivaris in de provincie |
| | 93 | Sports and recreation | Shotfirers and blasters | Schietmeester |

## Top-down approach

**Figure A.2.1 Employment of the regulated professions by sector (top-down approach), 2012**




Source: European Union Labour Force Survey, Eurostat, Ecorys calculations.
Note: the data for the sectors electricity, gas, steam and air conditioning supply, warehousing and support activities for transportation, fishing, air transport, sports and recreation are not reported due to the fact that the employment figures are below 2500 people.

## Bottom-up approach

| ISCO code | ISCO occupation | Regulated profession | Employment from LFS | Share adopted in the study |
|---|---|---|---|---|
| 1112 | Senior government officials | Brandweerofficier | 9700 | 5% |
| 2111 | Physicists and astronomers | Klinisch fysicus | * | 25% |
| 2113 | Chemists | Klinisch chemicus | 3200 | 25% |
| 2131 | Biologists, botanists, zoologists and related professionals | Biotechnicus<br>Medische microbiologie | 5200 | 50% |
| 2161 | Building architects | Architect<br>Architect (verworven rechten)<br>Interieurarchitect | 15200 | 100% |
| 2162 | Landscape architects | Tuin- en landschapsarchitect | * | 50% |
| 2164 | Town and traffic planners | Stedenbouwkundige | 4400 | 50% |
| 2211 | Generalist medical practitioners | Basic medical training – Netherlands<br>Heelkunde<br>Huisarts | 23900 | 100% |

| ISCO code | ISCO occupation | Regulated profession | Employment from LFS | Share adopted in the study |
|---|---|---|---|---|
| 2212 | Specialist medical practitioners | Kindergeneeskunde<br>Allergologie (until 12 August 1996)<br>Anesthesiologie<br>Klinische genetica<br>Klinische geriatrie<br>Longziekten en tuberculose<br>Maag-darm-leverziekten<br>Cardiologie<br>Cardio-thoracale chirurgie<br>Dermatologie en venerologie<br>Neurochirurgie<br>Neurologie<br>Duikerarts<br>Maatschappij en gezondheid<br>Nucleaire geneeskunde<br>Obstetrie en Gynaecologie<br>Oogheelkunde<br>Pathologie<br>Plastische Chirurgie<br>Interne geneeskunde<br>Psychiatrie<br>Keel-, neus- en oorheelkunde<br>Radiologie<br>Radiotherapie<br>Reumatologie<br>Klinisch neuropsycholoog<br>Klinisch psycholoog<br>Revalidatiegeneeskunde<br>Urologie<br>Zenuw- en zielsziekten<br>Stralingsarts<br>Medisch nucleair werker<br>Keurmeester post mortem keuring<br>Duikmedische begeleider | 34200 | 100% |
| 2221 | Nursing professionals | Orthopedie<br>Verpleegkundig Specialist acute zorg bij somatische aandoeningen<br>Verpleegkundig Specialist chronische zorg bij somatische aandoeningen<br>Verpleegkundig Specialist geestelijke gezondheidszorg<br>Verpleegkundig Specialist intensieve zorg bij somatische aandoeningen<br>Verpleegkundig Specialist preventieve zorg bij somatische aandoeningen<br>Verpleegkundige | 74900 | 100% |
| 2222 | Midwifery | Verloskundige | 3700 | 100% |

| ISCO code | ISCO occupation | Regulated profession | Employment from LFS | Share adopted in the study |
|---|---|---|---|---|
| | professionals | | | |
| 2250 | Veterinarians | DIERENARTS Dierenfysiotherapeut Verzorger embryo-/eicelwinning Verzorger embryotransplantatie | 5000 | 50% |
| 2261 | Dentists | Specialised dentist (Oral surgery) Tandarts Specialised dentist (Orthodontics) | 8800 | 100% |
| 2262 | Pharmacists | Ziekenhuisapotheker | 4200 | 50% |
| 2263 | Environmental and occupational health and hygiene professionals | — Arbeid en gezondheid, bedrijfsgeneeskunde — Arbeid en gezondheid, verzekeringsgeneeskunde Arbeidshygiënist Coördinerend stralingsdeskundige Toezichthoudend stralingsdeskundige | 7100 | 100% |
| 2264 | Physiotherapists | Fysiotherapeut Oefentherapeut-cesar Oefentherapeut-mensendieck | 33800 | 100% |
| 2265 | Dieticians and nutritionists | Diëtist | 5100 | 100% |
| 2266 | Audiologists and speech therapists | Logopedist | 11200 | 5% |
| 2267 | Optometrists and ophthalmic opticians | Optometrist Orthoptist | * | 50% |
| 2269 | Health professionals not elsewhere classified | Ergotherapeut Huidtherapeut Podotherapeut | 4500 | 50% |
| 2310 | University and higher education teachers | Docent hoger pedagogisch onderwijs Leraar hoger onderwijs Docent hoger beroepsonderwijs | 34500 | 100% |
| 2320 | Vocational education teachers | Docent beroepsonderwijs en volwasseneneducatie, be Leraar sector educatie en beroepsonderwijs (voorheen leraar middelbaar beroepsonderwijs) | 91900 | 100% |
| 2330 | Secondary education teachers | Leraar voorbereidend wetenschappelijk onderwijs/algemeen voortgezet onderwijs/voorbereidend beroepsonderwijs (vwo, havo, vmbo) | 77800 | 100% |
| 2341 | Primary school teachers | Leraar basisonderwijs | 7900 | 100% |
| 2352 | Special needs teachers | Leraar (voortgezet) speciaal onderwijs | 6500 | 100% |

| ISCO code | ISCO occupation | Regulated profession | Employment from LFS | Share adopted in the study |
|---|---|---|---|---|
| 2411 | Accountants | Accountant – administratieconsulent<br>Registeraccountant | 58400 | 50% |
| 2423 | Personnel and careers professionals | Arbeids- en organisatiedeskundige | 66800 | 5% |
| 2611 | Lawyers | Advocaat | 15800 | 100% |
| 2612 | Judges | Ledenopenbaar ministerie (advocaten-general, procureur-general, officieren van justitie en hun plaatsvervangers)<br>Rechters (presidenten, vice-presidenten, raadsheren)van kantongerechten,arrondisse-mentsrechtbanken,gerechtshoven,hogeraadleden openbaar ministerie(adv.gen, procureurs-generaal,officieren van justitie en hun plaatsvervangers), gerechtsauditeurs | 2600 | 100% |
| 2619 | Legal professionals not elsewhere classified | Kandidaat-notaris<br>Gerechtsauditeur<br>Griffiers en substituur-griffiers<br>Kandidaat-gerechtsdeurwaarder<br>Octrooigemachtigde | 52200 | 25% |
| 2621 | Archivists and curators | Bewaarder van het kadaster en de openbare registers<br>Rijksarchivaris<br>Rijksarchivaris in de provincie | 3000 | 5% |
| 2634 | Psychologists | Psycholoog, gezondheidszorg-Psychotherapeut | 49600 | 100% |
| 2643 | Translators, interpreters and other linguists | Beëdigd tolk<br>Beëdigd vertaler | 12600 | 50% |
| 3115 | Mechanical engineering technicians | Gasdeskundige tankschepen<br>Lpg-technicus | 17200 | 5% |
| 3123 | Construction supervisors | Toezichthouder asbestverwijdering<br>Sloopdeskundige asbest | 26100 | 5% |
| | | | | |
| 3151 | Ships' engineers | Motordrijver<br>Werktuigkundige iv visvaartScheepswerktuigkundige a<br>Scheepswerktuigkundige b<br>Scheepswerktuigkundige C<br>Stuurman werktuigkundige v visvaart<br>Werktuigkundige iv visvaart | * | 100% |
| 3152 | Ships' deck officers and pilots | Certificaat-loods<br>Eerste stuurman voor de grote | 12400 | 50% |

| ISCO code | ISCO occupation | Regulated profession | Employment from LFS | Share adopted in the study |
|---|---|---|---|---|
| | | handelsvaart<br>Kapitein grote handelsvaart<br>Maritiem officier<br>Register-loods<br>Stuurman iv visvaart<br>Stuurman kleine handelsvaart<br>Tweede of derde stuurman voor de grote handelsvaart | | |
| 3154 | Air traffic controllers | Luchtverkeersleider | * | 5% |
| 3212 | Medical and pathology laboratory technicians | Radiotherapeutisch laborant/ radiodiagnostisch laborant | 18400 | 5% |
| 3213 | Pharmaceutical technicians and assistants | Apothekersassistent | 21800 | 100% |
| 3214 | Medical and dental prosthetic technicians | Tandprotheticus | 6600 | 50% |
| 3251 | Dental assistants and therapists | Mondhygiënist | 19300 | 50% |
| 3255 | Physiotherapy technicians and assistants | Heilgymnast – masseur | 3400 | 5% |
| 3257 | Environmental and occupational health inspectors and associates | Veiligheidskundige | 3600 | 50% |
| 3322 | Commercial sales representatives | Distributeur bestrijdingsmiddelen | 24100 | 5% |
| 3355 | Police inspectors and detectives | Inspecteur van politie (officier)<br>Particulier rechercheur (detective) | 12300 | 25% |
| 3359 | Regulatory government associate professionals not elsewhere classified | Monsternemer mestoffenwet | 3100 | 5% |
| 3411 | Police inspectors and detectives | Gerechtsdeurwaarder | 6200 | 5% |
| 5153 | Building caretakers | Beheerder bedrijfsinrichting, asiel of pension | 25200 | 5% |
| 5164 | Pet groomers and animal care workers | Proefdierverzorger | 14400 | 5% |
| 5165 | Driving instructors | Rij-instructeur | 11500 | 100% |
| 5311 | Child care workers | Beroepskracht bij een kindercentrum | 123500 | 50% |

| ISCO code | ISCO occupation | Regulated profession | Employment from LFS | Share adopted in the study |
|---|---|---|---|---|
| | | / peuterspeelzaal | | |
| 5321 | Health care assistants | Verzorgende individuele gezondheidszorg (formerly ziekenverzorgende) | 55000 | 50% |
| 5411 | Fire-fighters | Alle brandweerberoepen niet zijnde brandweerofficier | 6300 | 100% |
| 5412 | Police officers | Medewerker basispolitiefunctie (agent)<br>Surveillant van politie | 31400 | 100% |
| 5414 | Security guards | Particulier beveiliger | 45300 | 50% |
| 6111 | Field crop and vegetable growers | Beheerder landbouwspuitbedrijf<br>Uitvoerder gewasbescherming | 13600 | 5% |
| 6122 | Poultry producers | Houder van vleeskuikens | 4300 | 5% |
| 7231 | Motor vehicle mechanics and repairers | Keurmeester periodieke keuring (zware) voertuigen<br>Keurmeester periodieke keuring lichte voertuigen | 54700 | 5% |
| 7411 | Building and related electricians | Installateur alarmapparatuur | 44100 | 5% |
| 8343 | Crane, hoist and related plant operators | Kraanmachinist | 16600 | 5% |

Source: European Labour Survey, 2012.
Note: * means that there are fewer than 2500 people employed in this occupation. Other regulated professions in the Netherlands are not present in the European Labour Survey.

# Annex 3. Results of Input-Output model

## Bottom-up approach

**Table A.3.1 Bottom-up approach by sector groupings**

| Sector | Value added | value added due to regul prof | Direct effect | multipl ef dur to reg prof | Indirect effect | Total |
|---|---|---|---|---|---|---|
| Health and social services | 55952 | 23361 | 4.34% | 672 | 0.12% | 4.5% |
| Education | 27064 | 13109 | 2.44% | 61 | 0.01% | 2.4% |
| Public administration, public services and compulsory social security | 39194 | 4653 | 0.86% | 155 | 0.03% | 0.9% |
| Business services | 20393 | 3321 | 0.62% | 384 | 0.07% | 0.7% |
| Transport | 21249 | 366 | 0.07% | 114 | 0.02% | 0.1% |
| Construction | 14097 | 221 | 0.04% | 60 | 0.01% | 0.1% |
| Wholesale and retail | 52275 | 198 | 0.04% | 18 | 0.00% | 0.0% |
| Network services | 11131 | 149 | 0.03% | 174 | 0.03% | 0.1% |
| Agriculture, forestry, mining | 9015 | 77 | 0.01% | 32 | 0.01% | 0.0% |
| Entertainment | 4938 | 37 | 0.01% | 2 | 0.00% | 0.0% |
| Other sectors | 41615 | 0 | 0% | 0 | 0% | 0.0% |
| **Total economy** | **538037** | **75019** | **8.45%** | **1672** | **0.31%** | **8.76%** |

Source: Ecorys calculations.
Note: A direct effect represents a change in the production of the sector when the demand in this sector changes. An indirect effect represents a change in the production of other sectors when there is a change in demand in the an industry.

**Table A.3.2 Bottom-up approach by sectors**

| Sector Code | Sector | Sector | Value added (mln euros) | Direct effect (mln euros) | Direct effect (%) | Indirect effect (mln euros) | Indirect effect (%) | Total effect |
|---|---|---|---|---|---|---|---|---|
| 86 | Gezondheidszorg | Human health activities | 30,251 | 20,841 | 3.87% | 624 | 0.12% | 3.99% |
| 85 | Onderwijs | Education | 27,064 | 13,109 | 2.44% | 61 | 0.01% | 2.45% |
| 87-88 | Verzorging en welzijn | Residential care and guidance; Social work activities without accommodation | 25,701 | 2,520 | 0.47% | 48 | 0.01% | 0.48% |
| 69-70 | Managementadvies en holdings | Legal and accounting activities; Activities of head offices; management consultancy activities | 8,411 | 1,468 | 0.27% | 68 | 0.01% | 0.29% |
| 84 | Openbaar bestuur en overheidsdiensten | Public administration, public services and compulsory social security | 39,194 | 4,653 | 0.86% | 155 | 0.03% | 0.89% |
| 43 | Gespecialiseerde bouw | Specialised construction activities | 14,097 | 221 | 0.04% | 60 | 0.01% | 0.05% |
| 35 | Energiebedrijven | Electricity, gas, steam and air conditioning supply | 11,131 | 149 | 0.03% | 174 | 0.03% | 0.06% |
| 46 | Groothandel en handelsbemiddeling | Wholesale trade (no motor vehicles and motorcycles) | 44,595 | 104 | 0.02% | 3 | 0.00% | 0.02% |
| 49 | Vervoer over land | Land transport | 11,271 | 100 | 0.02% | 6 | 0.00% | 0.02% |
| 45 | Autohandel en -reparatie | Sale and repair of motor vehicles, motorcycles and trailers | 7,680 | 94 | 0.02% | 15 | 0.00% | 0.02% |
| 74-75 | Design en veterinaire diensten | Other professional, scientific and technical activities; Veterinary activities | 2,252 | 930 | 0.17% | 58 | 0.01% | 0.18% |
| 71 | Architecten-, ingenieursbureaus e.d. | Architects, engineers and technical design and consultancy; testing and analysis | 6,505 | 607 | 0.11% | 249 | 0.05% | 0.16% |
| 1 | Landbouw | Agriculture | 8,899 | 46 | 0.01% | 32 | 0.01% | 0.01% |
| 50 | Vervoer over water | Water transport | 1,350 | 162 | 0.03% | 104 | 0.02% | 0.05% |
| 80 | Beveiligings- en opsporingsdiensten | Security and investigation activities | 1,233 | 153 | 0.03% | 0 | 0.00% | 0.03% |

| Sector Code | Sector | Sector | Value added (mln euros) | Direct effect (mln euros) | Direct effect (%) | Indirect effect (mln euros) | Indirect effect (%) | Total effect |
|---|---|---|---|---|---|---|---|---|
| 72 | Research | Research and development | 1,992 | 163 | 0.03% | 9 | 0.00% | 0.03% |
| 52 | Opslag en dienstverlening voor vervoer | Warehousing and support activities for transportation | 8,194 | 103 | 0.02% | 3 | 0.00% | 0.02% |
| 3 | Visserij | Fishing | 116 | 31 | 0.01% | 0 | 0.00% | 0.01% |
| 93 | Sport en recreatie | Sports and recreation | 1,521 | 37 | 0.01% | 2 | 0.00% | 0.01% |
| 51 | Vervoer door de lucht | Air transport | 434 | 1 | 0.00% | 1 | 0.00% | 0.00% |
| 90-91 | Kunst en cultuur | Arts; Lending of cultural goods, public archives, museums, botanical and zoological gardens and nature reserves activities | 3,417 | 0 | 0.00% | 0 | 0.00% | 0.00% |
| Other sectors | | | 282,729 | 0 | 0% | - | 0% | 0% |
| Total economy | | | 538,037 | 45,492 | 8.46% | 45,492 | 0.31% | 8.77% |

Source: Ecorys calculations.
Note: A direct effect represents a change in the production of the sector when the demand in this sector changes. An indirect effect represents a change in the production of other sectors when there is a change in demand in the an industry.

## Top-down approach

**Table A.3.3 Top-down approach by sector groupings**

| Sector | Value added | value added due to regul prof | Direct effect | multipl ef due to reg prof | Indirect effect | Total |
|---|---|---|---|---|---|---|
| Health and social services | 26794 | 4.98% | 753 | 0.140% | 26794 | 5.1% |
| Education | 13001 | 2.42% | 60 | 0.011% | 13001 | 2.4% |
| Public administration, public services and compulsory social security | 4628 | 0.86% | 154 | 0.029% | 4628 | 0.9% |
| Business services | 9199 | 1.71% | 868 | 0.161% | 9199 | 1.9% |

| Sector | Value added | value added due to regul prof | Direct effect | multipl ef due to reg prof | Indirect effect | Total |
|---|---|---|---|---|---|---|
| Transport | 2405 | 0.45% | 560 | 0.104% | 2405 | 0.6% |
| Construction | 4549 | 0.85% | 1231 | 0.229% | 4549 | 1.1% |
| Wholesale and retail | 3557 | 0.66% | 301 | 0.056% | 3557 | 0.7% |
| Network services | 3545 | 0.66% | 4160 | 0.773% | 3545 | 1.4% |
| Agriculture, forestry, mining | 811 | 0.15% | 522 | 0.097% | 811 | 0.2% |
| Entertainment | 37 | 0.01% | 2 | 0.000% | 37 | 0.0% |
| Other sectors | 0 | 0% | 0 | 0% | 0 | 0.0% |
| **Total economy** | **68526** | **12.73%** | **8612** | **1.60%** | **68526** | **14.33%** |

Source: Ecorys calculations.
Note: A direct effect represents a change in the production of the sector when the demand in this sector changes. An indirect effect represents a change in the production of other sectors when there is a change in demand in the an industry.

**Table A.3.4 Top-down approach by sector**

| Sector Code | Sector | Sector | Value added (mln euros) | Direct effect (mln euros) | Direct effect (%) | Indirect effect (mln euros) | Indirect effect (%) | Total effect |
|---|---|---|---|---|---|---|---|---|
| 86 | Gezondheidszorg | Human health activities | 30,251 | 22,223 | 4.13% | 665 | 0.12% | 4.25% |
| 85 | Onderwijs | Education | 27,064 | 13,001 | 2.42% | 60 | 0.01% | 2.43% |
| 87-88 | Verzorging en welzijn | Residential care and guidance; Social work activities without accommodation | 25,701 | 4,571 | 0.85% | 88 | 0.02% | 0.87% |
| 69-70 | Managementadvies en holdings | Legal and accounting activities; Activities of head offices; management consultancy activities | 8,411 | 5,628 | 1.05% | 259 | 0.05% | 1.09% |
| 84 | Openbaar bestuur en overheidsdiensten | Public administration, public services and compulsory social security | 39,194 | 4,628 | 0.86% | 154 | 0.03% | 0.89% |
| 43 | Gespecialiseerde bouw | Specialised construction activities | 14,097 | 4,549 | 0.85% | 1,231 | 0.23% | 1.07% |
| 35 | Energiebedrijven | Electricity, gas, steam and air conditioning supply | 11,131 | 3,545 | 0.66% | 4,160 | 0.77% | 1.43% |
| 46 | Groothandel en handelsbemiddeling | Wholesale trade (no motor vehicles and motorcycles) | 44,595 | 2,067 | 0.38% | 58 | 0.01% | 0.39% |

| Sector Code | Sector | Sector | Value added (mln euros) | Direct effect (mln euros) | Direct effect (%) | Indirect effect (mln euros) | Indirect effect (%) | Total effect |
|---|---|---|---|---|---|---|---|---|
| 49 | Vervoer over land | Land transport | 11,271 | 1,565 | 0.29% | 92 | 0.02% | 0.31% |
| 45 | Autohandel en -reparatie | Sale and repair of motor vehicles, motorcycles and trailers | 7,680 | 1,490 | 0.28% | 243 | 0.05% | 0.32% |
| 74-75 | Design en veterinaire diensten | Other professional, scientific and technical activities; Veterinary activities | 2,252 | 1,490 | 0.28% | 0 | 0.00% | 0.28% |
| 71 | Architecten-, ingenieursbureaus e.d. | Architects, engineers and technical design and consultancy; testing and analysis | 6,505 | 1,429 | 0.27% | 585 | 0.11% | 0.37% |
| 1 | Landbouw | Agriculture | 8,899 | 751 | 0.14% | 522 | 0.10% | 0.24% |
| 50 | Vervoer over water | Water transport | 1,350 | 705 | 0.13% | 451 | 0.08% | 0.21% |
| 80 | Beveiligings- en opsporingsdiensten | Security and investigation activities | 1,233 | 244 | 0.05% | 0 | 0.00% | 0.05% |
| 72 | Research | Research and development | 1,992 | 408 | 0.08% | 23 | 0.00% | 0.08% |
| 52 | Opslag en dienstverlening voor vervoer | Warehousing and support activities for transportation | 8,194 | 110 | 0.02% | 4 | 0.00% | 0.02% |
| 3 | Visserij | Fishing | 116 | 60 | 0.01% | 0 | 0.00% | 0.01% |
| 93 | Sport en recreatie | Sports and recreation | 1,521 | 37 | 0.01% | 2 | 0.00% | 0.01% |
| 51 | Vervoer door de lucht | Air transport | 434 | 25 | 0.00% | 13 | 0.00% | 0.01% |
| 90-91 | Kunst en cultuur | Arts; Lending of cultural goods, public archives, museums, botanical and zoological gardens and nature reserves activities | 3,417 | - | 0.00% | - | 0.00% | 0.00% |
| Other sectors | | | 282,729 | - | 0.00% | - | 0.00% | 0.00% |
| **Total economy** | | | **538,037** | **68,526** | **12.74%** | **8,612** | **1.60%** | **14.34%** |

Source: Ecorys calculations.

Note: A direct effect represents a change in the production of the sector when the demand in this sector changes. An indirect effect represents a change in the production of other sectors when there is a change in demand in the an industry.

**Figure A.3.1 Direct impact of regulated professions, top-down and bottom-up approaches (value added)**

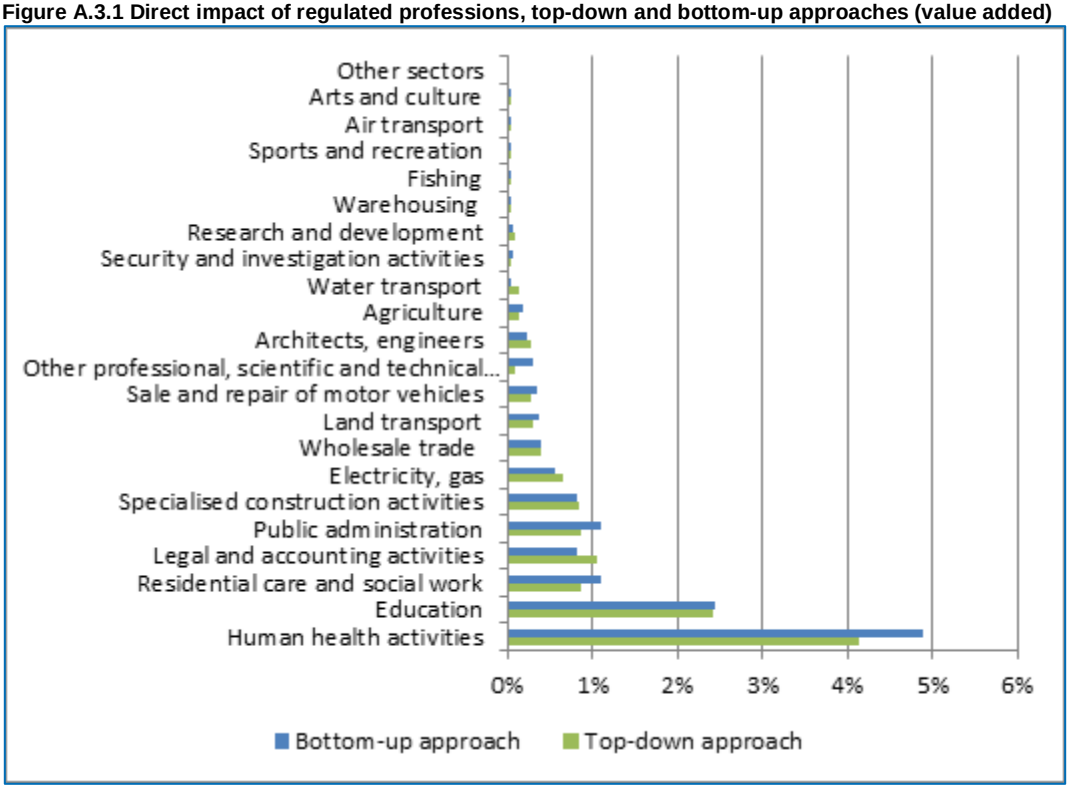



**Figure A.3.2 Indirect impact of regulated professions, top-down and bottom-up approaches (value added)**

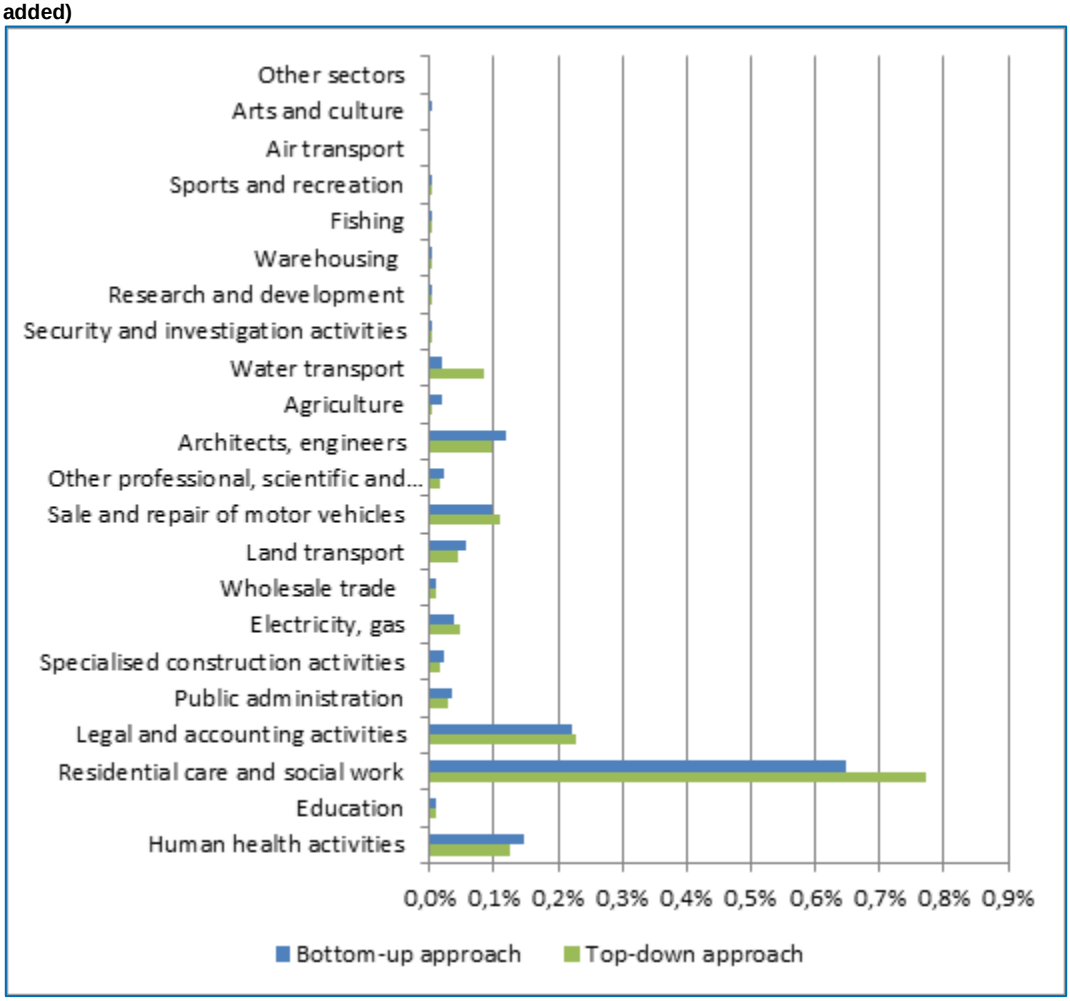


**Table A.3.5 Calculation of the effect of the modernisation of the regulated professions in the Netherlands**

| Result [0] | | | Year | | | | | | | | | | | | |
|---|---|---|---|---|---|---|---|---|---|---|---|---|---|---|---|
| | | | | 0 | 1 | 2 | 3 | 4 | 5 | 6 | 7 | 8 | 9 | 10 | Cumulative effect |
| Effect on GDP due to regulated professions modernization | lower bound | [1a] | 0.06% | | | | | | | | | | | | |
| | upper bound | [1b] | 0.10% | | | | | | | | | | | | |
| Realized effect (assumption) | | [2] | | 0 | 0.25 | 0.5 | 0.75 | 1 | 1 | 1 | 1 | 1 | 1 | 1 | |
| Nominal interest rate (assumption) | | [3] | 2.50% | | | | | | | | | | | | |
| GDP (mln euros) | | [4] | 538,037 | | | | | | | | | | | | |
| Increase in GDP, in shares | lower bound | [5a]=[1a]*[2] | | 0 | 0.0001 | 0.00029 | 0.0004 | 0.0005 | 0.0005 | 0.0005 | 0.0005 | 0.0005 | 0.0005 | 0.0005 | |
| | upper bound | [5b]=[1b]*[2] | | 0 | 0.0002 | 0.00048 | 0.00072 | 0.00096 | 0.00096 | 0.00096 | 0.00096 | 0.00096 | 0.00096 | 0.00096 | |
| Increase in GDP, in mln euros | lower bound | [6a]=[5a]*[4] | | 0 | 80 | 160 | 239 | 319 | 319 | 319 | 319 | 319 | 319 | 319 | 2713 |
| | upper bound | [6b]=[5b]*[4] | | 0 | 130 | 261 | 391 | 521 | 521 | 521 | 521 | 521 | 521 | 521 | 4431 |

| Result [0] | | | Year | | | | | | | | | | | | |
|---|---|---|---|---|---|---|---|---|---|---|---|---|---|---|---|
| | | | | 0 | 1 | 2 | 3 | 4 | 5 | 6 | 7 | 8 | 9 | 10 | Cumulative effect |
| Increase in GDP, in mln euros, discounted value | lower bound | [7a]=[6a]/(1+[3]/100)^[0] | | | 78 | 152 | 222 | 289 | 282 | 275 | 269 | 262 | 256 | 249 | 2334 |
| | upper bound | [7b]=[6b]/(1+[3]/100)^[0] | | | 127 | 248 | 363 | 472 | 461 | 450 | 439 | 428 | 417 | 407 | 3812 |

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