Measurement of impact of cross-border penetration in public procurement

Final report

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Table of Contents

Index of Tables and Figures

Tables

Figures

EXECUTIVE SUMMARY

The EU public procurement rules seek to promote transparency and competition in procurement markets, to the benefit of all EU contracting authorities. Penetration of cross-border purchasing in public procurement is a gauge of the extent to which public procurement rules have successfully created transparent and competitive markets for public purchasing across all EU Member States. This study makes a detailed assessment of the level and trends of cross-border public procurement and seeks to identify the factors that explain observed differences across all the sub-markets that are subject to the public procurement Directives.[1]

The extent to which EU public sector entities engage in cross-border purchasing is analysed at award-level using the TED database[2] and, at the macroeconomic level, using alternative statistical sources for trade data.

Public sector definition and, to a large extent, data sources, follow those of previous studies[3] in order to maintain comparability. The study covers all EU Member States and an additional six comparator countries[4], over the period 2009-2015, where data is available.

ANALYSIS OF IMPORT PENETRATION FROM TRADE AND INPUT-OUTPUT DATA

From aggregate trade data, the study describes the overall import penetration per country, over time, per partner country, and per NACE sector.

The import penetration across EU countries and a selection of their main trading partners varies substantially. The countries that have highest import penetration are Luxembourg and Malta, which is likely to reflect their small economic size. They are closely followed by Ireland, Slovakia, Hungary and Belgium. In contrast, Italy, Spain, France and the UK have the lowest level of import penetration among the European countries. Outside this group, China, Japan and the US are the more notable examples of low import penetration.

Particularly significant increases in import penetration have occurred since 2000 in the Czech Republic, Latvia, Lithuania and Slovakia. Some decreases should also be pointed out, most noticeably in Cyprus, Malta, and, to a smaller extent, Spain. Both **total import trends and the extent to which countries import within the EU vary widely across the EU28**. Indeed, the share of intra-EU imports varies from 46% in the Netherlands to 82% in Estonia. Despite this heterogeneity, it can be noted that, for the majority of EU28 countries, the bulk of imports are from within the EU, and that this trend has not seen major shifts in the recent years.

Import penetration by trading partner appears to depend on factors such as geography, language and culture. For instance, a high percentage of Portuguese intra-EU imports are from Spain and a high percentage of Irish imports are from the UK.

It can also be observed that for the majority of countries in the sample Germany accounted for the highest percentage of intra EU imports. The other main exporting countries are the Netherlands, France and Italy.

From input-output-use data, the study describes import penetration in public sector purchasing, per country, relative to the private sector and the economy as a whole.

Import penetration in public sector use is estimated at around 7.9% across the EU with import penetration at the Member State level ranging from just under 6% in Italy and Sweden to 20.5%

1 Although now repealed, the Public Procurement Directives relevant for the public procurement data analysed in this report are: Directive 2004/17/EC on procurement procedures in the water, energy, transport and postal services sectors and Directive 2004/18/EC on procurement procedures in public works, supply and service contracts. The former is often referred to as the "Utilities Directive" and the latter as the "Classical Directive".
2 TED (Tenders Electronic Daily) is the online version of the 'Supplement to the Official Journal' of the EU, dedicated to European public procurement.
3 Namely, "Cross border Procurement above EU thresholds" – Ramboll and HTW Chur, March 2011 (http://ec.europa.eu/internal_market/publicprocurement/docs/modernising_rules/cross-border-procurement_en.pdf).
4 Canada, China, Japan, US, Switzerland, and Norway.

in Bulgaria. High levels of import penetration in the public sector seem to be a feature of Eastern European countries, for example Slovakia, the Czech Republic and Latvia.

In general, public sector import penetration appears to be lower in larger countries such as Italy and Germany. In addition, relatively low values are also found in the Netherlands, Denmark and Sweden.

Public sector import penetration is everywhere less than private sector import penetration and this difference is found to be greater in Malta, the Netherlands and Belgium. At the EU level, it is estimated that **import penetration in the private sector is about 10% higher than in the public sector**.

Products which tend to have high public sector import penetration include: mining, pharmaceuticals, metals, textiles, furniture, chemicals, electronics, machinery and transport equipment. Import penetration in service sectors tends to be much lower across the board. This is unsurprising as the provision of services is more likely to be dependent on geographical proximity and language barriers. Furthermore, certain services are inherently non-tradable since they cannot be produced and delivered in separate locations. Nonetheless, there is significant import penetration in water and air transport services, accommodation and food, publishing, and insurance and advertising.

It can be observed that, at the product level, import penetration is actually more often higher in the public sector than in the private sector, especially in sectors such as refined petroleum, chemicals, pharmaceuticals, rubber and plastic, basic metals, electrical equipment, and air transport. Most of these sectors, however, represent a relatively small share of public purchasing compared to main sectors where public purchasing is mainly domestic such as: security, public administration and defence, social security, education and health. These five sectors alone represent over 58% of public sector purchasing and are all heavily tilted towards domestic purchasing.

There is no consistent indication of a domestic bias in public purchasing despite of the fact that overall import penetration in private purchasing is significantly higher than for the public sector. **Higher import penetration in private sector purchasing appears to a large extent to be explained by the significant differences in the composition of purchases** between the two groups.

ANALYSIS OF DIRECT AND INDIRECT CROSS-BORDER PROCUREMENT FROM THE TED DATABASE

The study considers all public procurement contract awards in the TED database from Q1 2009 to Q4 2015.

The study focuses on two distinct forms of cross-border procurement: *direct cross-border procurement* - where the successful bidder is not located in the same country as the contracting authority and is not domestically owned, and *indirect cross-border procurement* - where the successful bidder is based in the same country as the contracting authority but is a subsidiary of a foreign company.

While direct cross-border procurement can be readily identified, identification of indirect cross-border contracts requires a lengthier process as firm ownership of the winning bidder has to be determined. This relied on matching successful bidders to firm names contained in the Orbis database[5] and then identification of the matched firms' corporate linkages in order to determine the nationality of the global ultimate owner.

At the end of this process, a quite successful matching rate was achieved, even though the **match rates and the success of the different matching techniques varied across countries**. Indeed, the match rate of contract awards was over 85% in 22 of the 28 EU Member States. Only two countries have match rates of contract awards below 80%: Cyprus and Greece. Greece's particularly low match rate of 28% is partly attributed to issues associated with non-

5 Orbis is a proprietary database which records firm-level information for over 200 million companies provided by Bureau Van Dijk.

Latin characters but is also due to the fact that the Orbis database contains a relatively small proportion of Greek firms.

The analysis has been restricted to contracts with award value between €1,000 and €200,000,000 to remove outliers and possible errors in data recording. Between 2009 and 2015, direct cross-border procurement's share of the number of contract awards in the EU28 countries was 1.7% while indirect cross-border procurement was considerably higher at 21.9% of all contract awards. In terms of value, direct cross-border was 3% and indirect cross-border 20.4% of total value of awards within the value range above.

Since 2009, **penetration of direct cross-border** procurement has **generally been increasing** both as a share of total value and as a share of the total number of contract awards. This trend reflects a substantial increase in direct cross-border procurement between 2012 and 2013 accompanied by only small changes in all other years.

Over the same period, the **indirect cross-border share** of both number and value of contracts awarded also **followed an overall increasing trend**: the share of total number rose from 19.9% to 22.6% while the share of the total value increased from 18.6% to 21.4%. This growth trend has not, however, been stable over time.

The per country analysis shows that **smaller countries are generally more likely to award contracts to firms located in other countries**. For example, the only countries with direct cross-border shares of number of awards above 10% were Malta (11.9%), Ireland (13.0%) and Luxembourg (16.8%). These high levels of direct cross-border procurement may be explained by the fact that:

- In smaller countries, there may be relatively less competition for contracts from domestically located firms; and
- The incentive for foreign companies to set up subsidiaries in these countries in order to gain (indirect cross-border) contracts is lower because they are small markets: as a result, foreign companies may be more likely to bid for contracts directly cross-border.

Despite this variability, the direct cross-border share in the number of awards remained under 5% in the majority of EU28 Member States.

Although at the EU level the direct share of cross-border procurement increased between 2009 and 2015, this was not the case for almost half of EU27 countries.[6] Indeed, several countries had their higher levels at the start of the period, including Cyprus, Estonia, Greece, Malta and Sweden. It is possible that the negative economic conditions had a generally dampening effect on cross-border purchasing or this may be due to development of the local economies and domestic producers widening the range of what they are able to supply.

As to indirect cross-border procurement, its share of the number of awards varied between 2.1% and 3.8% in Malta and Cyprus, respectively, to 34.8% in Romania. The low values for Malta and Cyprus may be a further indication that firms are relatively less incentivised to establish subsidiaries in the very small countries. The fact that Malta and Cyprus have a relatively high share of direct cross-border procurement, at 11.9% and 6.4%, respectively, further supports this view.

Over two-thirds of EU28 countries experienced an increase in the share of indirect cross-border procurement in the number of awards between 2009 and 2015. However, there was also significant variation over time and across countries.

Geographical, historical and language proximity all seem to encourage cross-border contracting. For instance, 75% of Irish direct cross-border contracts are won by UK companies and 69% of Slovakian direct cross-border contracts are won by Czech firms. Overall, Germany, UK, France and the Netherlands all stand out as the countries which supply relatively higher shares of cross-border contracts.

6 Croatia is only included from 2013 onwards.

In sectoral terms, the highest penetration of direct cross-border procurement was in sectors related to machinery and specialist equipment, while indirect cross-border procurement prevailed in a wide range of strong intellectual property sectors including medical equipment, pharmaceuticals, chemical products, precision equipment, IT services and telecoms. On the other end of the spectrum, lower shares of direct cross-border procurement can be found in most other service sectors.

By type of contract, cross-border purchasing is more prevalent in supply contracts than in services or works.

Finally, by contracting authority, local authorities are the least likely to award cross-border contracts, while the utilities sector and central government appear somewhat above average in terms of cross-border awards.

EXPLANATORY FACTORS FOR CROSS-BORDER PROCUREMENT

Through a survey of enterprises covering all EU28 Member States and qualitative case studies, we investigated the factors which influence the propensity for procurement to take place across borders. Findings are presented from the perspective of businesses (sell side) and contracting authorities (buy side).

Businesses reported the following main obstacles for bidding cross-border (in parenthesis the percentage of respondents that perceived each of these as a 'high relevant barrier'):

1. 'High competition from national bidders' (40%);
2. 'Perceived preference among contracting authorities for local bidders' (39%);
3. 'Unfamiliar legal context or formal requirements (e.g. contract, labour law, certificates to provide such as special permits necessary for offering services abroad etc.) leading to market entry barriers in the awarding country' (32%);
4. 'Additional costs due to geographic distance (i.e. implementation of contract is more expensive compared to delivery of contract close to own location)' (30%);
5. 'Language barriers' (23%).

Furthermore, almost half of micro enterprises (46%) also reported that identifying sources to access information on cross-border public procurement was a challenge.

According to public authorities, there are two important benefits of public tendering reaching potential cross-border contractors:

1. The possibility of increasing competition and having a better choice in terms of quality and price;
2. The ability to fulfil contracts even with absence or limited availability of suppliers at national level.

The first factor was reported in the context of reducing public expenditure. The latter was found as a recurring issue, especially for highly specialised public institutions (e.g. universities, hospitals) which require technical expertise or intellectual property rights protected equipment from foreign companies.

Despite the perceived advantages of an EEA-wide procurement market, public authorities suggested that there are market niches where these benefits are limited. Some public authorities believe there is significant effort involved in designing a particular call for tenders in such a way as to encourage cross-border bidders to participate. Because of this, some implicitly assess whether domestic companies can undertake the work and only if this seems unlikely do the authorities then make an explicit effort to make cross-border bidders aware of the call. Public authorities have an underlying perception that a more international version of their call for tenders is more complicated than one that implicitly expects only domestic bidders. This perception is largely influenced by general lack of experience in '*doing-business-abroad*'. Sharing knowledge has been reported as a potential way to incentivize and promote best practices among public officers.

Some public authorities suggest that the 'pre-qualification system', as is implemented in Germany and Austria (*Präqualifikation*), should be expanded to a Europe-wide level. As such, a

given company interested in pursuing cross-border public procurement would need to send the required documents (e.g. Proof of no insolvency, Proof of payment of taxes and social contributions, confirmation of compliance with the trade law requirements, adherence to labour standards etc.) to a centralised public accreditation entity and, if successfully accredited, it would receive a 'prequalification number' that could be used for a certain time period (e.g. 1 year). Under this system, when bidding for a specific tender, the company would ideally only need to indicate the prequalification number to the public authority in question.

FINAL REMARKS

Direct cross-border purchasing by public authorities has increased moderately over the period 2009-2015 but remains very low at just 2% of the number of awards and 3.5% of the value of awards. Indirect cross-border is substantially higher, at above 20% of both number and value of awards, yet still very low by comparison to the levels of import penetration in the EU economies overall.

This observed low penetration of cross-border contracts in public purchasing appears, nonetheless, unlikely to reflect domestic bias on the part of contracting authorities. Instead, it seems to be largely attributable to the nature of what is purchased. Indeed, at the sectoral level, there is no evidence that the public sector has a lower propensity to import than the private sector.

In terms of trading partners, the behaviour of both direct and indirect cross-border procurement mirrors closely that of imports more broadly: import penetration is higher from trading partners that are culturally and geographically close. In terms of the relationship between cross-border contracting and country size, the relationship between low market size and high import penetration holds only for direct cross-border contracts and there is no observable relationship between the extent that countries engage in direct cross-border and indirect cross-border procurement.

The observed patterns for direct cross-border contracting are borne out by the results of the study's survey according to which competition from domestic suppliers and legal and language barriers are among the most important deterrents to cross-border bidding.

One other often mentioned deterrent to direct cross-border bidding, namely a perceived domestic bias on the part of contracting authorities, may be important to address even if this perception does not appear to be directly supported by the data.

The fact that indirect cross-border procurement is often high when direct cross-border is low may be a reflection of, actual or perceived, barriers to cross-border bidding which lead firms to rely on locally based subsidiaries for their cross-border sales.

1. INTRODUCTION

1.1. Objectives of the study

The EU public procurement rules seek to promote transparency and competition in procurement markets, in order to enhance value for money and quality of supply in public sector contracting. In particular, the rules aim to create a level playing field for all businesses across Europe, providing a common framework which organises the way public authorities and certain public utility operators purchase goods, works and services.

The conditions created by the EU public procurement rules are expected to result in stronger competition in procurement markets and, in particular, in increased cross-border tendering and awarding. Penetration of cross-border purchasing in public procurement is thus a gauge of the extent to which public procurement rules have successfully created transparent and competitive markets for public purchasing across all EU Member States.

This study makes a detailed assessment of the extent of above EU threshold cross-border participation in public procurement, both direct and indirect. It also identifies factors explaining the observed levels of cross-border participation in procurement markets subject to the Public Procurement Directives.

1.2. Regulatory background

A set of rules which were adopted by the European Commission in 2004, commonly referred to as the Public Procurement Directives, have governed a wide range of purchasing activities by public authorities and utilities sector entities, when their respective values are above certain thresholds. These were:

- **Directive 2004/18/EC (often referred to as the Classical Directive)** applies to purchasing contracts concluded by a public sector contracting authority for supplies, services and works.
- **Directive 2004/17/EC (often referred to as the Utilities Directive)** applies to purchasing contracts by contracting entities in the sectors of water, energy, transport and postal services.

The 2011 Green Paper on the modernisation of EU public procurement reflected a desire to simplify and update the European public procurement legislation to improve procedural efficiency and to make the award of contracts more flexible. Particular aims of streamlined procurement procedures are to best meet the needs of small contracting authorities, minimise procurement-related costs and ultimately facilitate the participation of both SMEs and cross-border bidders.

This led to a new legislative package in the field of European public procurement which came into force on 17th April 2014. It includes three new Directives:

- **Directive 2014/24/EU**, which repeals Directive 2004/18/EC on public works, supply and service contracts;
- **Directive 2014/25/EU**, which repeals Directive 2004/17/EC on procurement by entities operating in the water, energy, transport and postal services sectors; and
- **Directive 2014/23/EU** on the award of concession contracts.

Member States were committed to transpose this new legal framework into national law within 24 months of that date, i.e. no later than April 2016.[7] Directive 2004/18/EC and Directive 2004/17/EC are applicable until the transposition process concludes, and are, therefore, the Directives of relevance for the period 2009-2015 covered by the data used in the present study.

7 However, for some provisions, for example in the area of electronic communications, longer deadlines for national implementation (54 months) were provided for.

1.3. Cross-border procurement in prior studies

There are two main forms of cross-border procurement:

- Direct cross-border procurement:
    - corresponding to contracts won from awarding authorities located in a Member State different from where the bidding firm is located.
- Indirect cross-border procurement:
    - corresponding to contracts won from awarding authorities located in the same Member State as the bidding firm but where this firm's ultimate owner is from a different Member State.

In 2011, a study[8] found that in the period 2007-2009 direct cross-border contracts represented only 1.6% of the total number of public contracts above the EU threshold (and 3.5% of the total value).

Indirect cross-border contracts were much more significant, albeit with wide variations across different forms of indirect cross-border tendering:

- through affiliates of multi-national corporations in the Member State of the contracting authority (11.4% total number/13.4% total value);
- through acting as subcontractors (1.0% total number/0.2% total value);
- through consortia participation (0.3% total number/0.1% total value); or
- through acting as wholesalers/distributors (11.9% total number/11.9% total value).[9]

Pîrvu and Bâldan (2013) studied the differences in terms of the economic operators' access to the EU public procurement market depending on their country of origin analysing a sample of observations based on contract award notices published in TED in the period between 2007 and 2011. The authors found that:

- the participation of economic operators from non-Member States in the EU public procurement market is very low;
- the most common situation of cross-border public procurement is the awarding of public contracts in 'developed'[10] EU countries to economic operators from other "developed" EU countries;
- it is more common for 'less developed' EU countries companies to bid and win public contracts from 'developed' EU countries than from other 'less developed' EU countries;
- large and developed EU countries like Germany, the UK, France, and Italy dominate the cross-border public procurements in the European Union.

In terms of sectors, a recent DG Trade[11] study found that:

- the penetration of cross-border procurement is lower in services than in manufacturing sectors;
- the value share of cross-border contracts is highest for smaller Member States like Malta (41%), Cyprus (17%) and Luxemburg (16%), compared to an average of 3.7% for the EU as a whole;

8 Ramboll Management Consulting & HTW (2011) 'Cross-border procurement above threshold'. Available at: http://ec.europa.eu/internal_market/publicprocurement/docs/modernising_rules/cross-border-procurement_en.pdf.
9 Idem.
10 The 27 EU Member States were divided into two categories based on GDP per capita in PPS (Purchasing Power Standards), Member States with index higher than 100 were classified as 'developed'.
11 European Commission, DG Trade, Chief Economist Note, Determinants of direct cross - border public procurement in EU Member States, Zornitsa Kutlina-Dimitrova and Csilla Lakatos, 2014.

- patterns of cross-border awards also differ by type of procedure with open procedures less often leading to a cross-border award than negotiated procedures without a call for competition;
- utilities and central government exhibit the highest share of direct cross-border contracts compared with other types of awarding authorities.

Historic, cultural and geographic links have been found in previous studies to correlate strongly with observed patterns of cross-border procurement. Ramboll & HTW (2011) found that:

- 75% of all contracts awarded directly cross-border by contracting authorities in Ireland (987 awards between 2007 and 2009) and 37% of all contracts awarded directly cross-border by contracting authorities in Malta (36 awards) are awarded to economic operators in the United Kingdom;
- 84% of all contracts awarded directly cross-border by contracting authorities in Austria (524 awards) are awarded to economic operators in Germany;
- 47% of all contracts awarded directly cross-border by contracting authorities in Sweden (542 awards) are awarded to economic operators in Norway and 25% to economic operators in Denmark;
- 35% of all contracts awarded directly cross-border by contracting authorities in Estonia (182 awards) are awarded to economic operators in Finland.

Previous studies also highlight possible measures that may **be implemented to facilitate cross-border procurement**, such as: enhanced mutual recognition of certificates, an EU-wide pre-qualification system, make tender documents available in a second language, and accept tenders in foreign languages (Ramboll & HTW, 2011).

Furthermore, improving access for SMEs will probably result in more competition and lead to better value for money for procurers. It has been documented that countries that tend to break down certain tenders into a number of small lots, make it easier for SMEs, especially micro- and small enterprises, to access public contracts (GHK, 2010).[12]

1.4. Structure of this document

The report is structured as follows:

- Section 1 provides an introduction to the study's methodology and main components;
- Section 2 provides an analysis of import penetration on the basis of trade and output data;
- Section 3 introduces the methodology for classifying contract awards from the TED database and provides a detailed analysis of direct and indirect cross-border procurement on the basis of this data;
- Section 4 provides an analysis of the explanatory factors for cross-border procurement;
- Section 5 presents the conclusions of the study.

The following annexes are submitted (under Section 6):

- Annex 1: Overview of data availability for input-output approach;
- Annex 2: Extension of results for different definitions of the public sector;
- Annex 3: Methodology for determining direct and indirect cross-border procurement;
- Annex 4: Potential sources of bias;

12 GHK (2010) 'Evaluation of SMEs' Access to Public Procurement Markets in the EU'.

- Annex 5: Comparison of the methodology with the Ramboll study (2011);
- Annex 6: Orbis database definitions;
- Annex 7: Additional analysis of direct and indirect cross-border contracts;
- Annex 8: ComExt and Prodcom databases;
- Annex 9: Final survey;
- Annex 10: Our approach to the Case Studies.

2. ANALYSIS OF IMPORT PENETRATION FROM TRADE AND INPUT-OUTPUT DATA

2.1. Overview

This section provides a description and analysis of key trends in import penetration at the macroeconomic level, based on external trade data, domestic production data and input-output tables mainly from the statistical office of the European Union, Eurostat.[13]

Import penetration for the public sector and at the economy-wide level is influenced by country characteristics such as the size of the national economy, geographical location, natural endowments, the history and the structure of industry. For instance, economic theory suggests that import penetration is higher for small countries because of gains from specialisation and resource constraints, and that 'similar countries' (in terms of language, history, geography) are more likely to trade with each other.

This section provides a descriptive analysis of the variability in import penetration into public sector and economy-wide purchasing across the EU28 countries[14] and their main trading partners.[15]

It is structured as follows:

- the public sector is defined and the size of the public sector is compared across countries;
- import penetration at the economy-wide level based on trade data is analysed; and
- where data is available, the levels of public sector import penetration from input-output tables are discussed at the country and sector level.

The external trade data was expected to also allow for a comparison between import penetration in government expenditure and import penetration in other economy aggregates. However, due to limited availability and comparability of sources, this additional analysis had only limited success. Please see annex 6.8 for further details.

2.2. Definition of the public sector

In this report, in order to ensure comparability and continuity with previous studies, the definition of government implemented by Ramboll (2011) is maintained.

This definition of the public of sector encompasses two components:

- final consumption expenditure by the government and
- intermediate consumption in selected industries either covered by procurement procedures or likely to be dominated by government consumption.

The industries[16] considered in the second bullet above are:[17]

- NACE REV 2: D electricity, gas, steam and air conditioning supply (100%)

13 In particular, the ComExt (Eurostat's external trade database) and Prodcom (Eurostat's detailed production) database were use for the external trade and production data respectively. Input-output and use tables from Eurostat were used for the input-output analysis. However, national statistical institutes were also consulted where data was not available from Eurostat.
14 For the purpose of this report, EU Member States' overseas territories are not considered as part of the EU economy.
15 Canada, China, Norway, Switzerland, the US and Japan.
16 Given by the Statistical Classification of Economic Activities in the European Community (NACE).
17 Where NACE R1 sectors were used the definition of the public sector was adjusted accordingly. The public sector was defined as the final consumption expenditure of government + NACE REV 1: Education services (100%) + NACE REV 1: Health and social work services (100%) +NACE REV 1: Electrical energy, gas, steam and hot water (100%) + NACE REV 1: Collected and purified water, distribution services of water (100%) + NACE REV 1: Sewage and refuse disposal services, sanitation and similar services (100%) + NACE REV 1: Land transport; transport via pipeline services (33%) + NACE REV 1: Post and telecommunication services (50%) + NACE REV1: Public administration and defence; compulsory social security (100%).

- NACE REV 2: E water supply, sewerage waste management and remediation activities (100%)
- NACE REV2: H49 land transport and transport via pipelines (33%)
- NACE REV 2: H53 postal and courier services (50%)
- NACE REV2: J61 Telecommunications (50%)
- NACE REV2: O public administration and defence; compulsory social security (100%)
- NACE REV2: P Education (100%)
- NACE REV2: Q Human health and social work activities (100%)

As not all the activities above are necessarily provided for by the public sector across all European countries, the results for two alternative definitions of the public sector are included in annex 6.2 for comparison.

2.3. The size of the public sector

As shown in Table 1 below, the public sector represented around 17.1% of total use across the EU28 in 2012. If, however, the total for the EU28 is calculated using the latest data available for individual Member States, that percentage changes to 15.2%.

Malta and Luxembourg have the smaller shares of the public sector in their economies, at 6.0% and 6.1% respectively. Countries with shares significantly above the EU28 average include the UK, Denmark and France, with 19.4%. 17.2% and 17.1% respectively.

The size of the public sector in some third countries was higher than the EU28 average, significantly so in Japan and to a smaller extent in China and Canada.

It should be noted that applying the same definition of the public sector across all countries will overestimate the public sector in countries where the public provision of services is low. For instance, the public sector share in the US included in the table is likely to be an overestimate as the US public sector contributes only a relatively small share of, for example, the cost of healthcare provision.

Table 1: Size of the public and private sector

Country	Value (Bn EUR)			Share of sectors' demand in total use	
	Public sector	Private sector	Total use	Public sector	Private sector
Austria, 2012	105.70	645.23	750.93	14.1%	85.9%
Belgium, 2010	125.77	889.64	1,015.41	12.4%	87.6%
Bulgaria, 2010	11.73	84.75	96.49	12.2%	87.8%
Croatia, 2010	15.13	78.39	93.52	16.2%	83.8%
Cyprus, 2009	4.96	27.58	32.54	15.2%	84.8%
Czech R.,2012	58.28	438.64	496.92	11.7%	88.3%
Denmark, 2011	94.50	453.48	547.99	17.2%	82.8%
Estonia, 2011	5.57	41.84	47.41	11.7%	88.3%
Finland, 2011	73.90	383.67	457.58	16.2%	83.8%
France, 2012	746.17	3,609.06	4,355.23	17.1%	82.9%
Germany, 2011	812.57	5,314.21	6,126.78	13.3%	86.7%
Greece, 2010	69.11	354.87	423.98	16.3%	83.7%
Hungary, 2012	31.24	248.37	279.61	11.2%	88.8%

Country	Value (Bn EUR)			Share of sectors' demand in total use	
	Public sector	Private sector	Total use	Public sector	Private sector
Ireland, 2011	46.53	417.24	463.77	10.0%	90.0%
Italy, 2012	526.65	3,036.65	3,563.30	14.8%	85.2%
Latvia,1998	1.27	8.22	9.49	13.4%	86.6%
Lithuania, 2010	9.42	58.70	68.12	13.8%	86.2%
Luxembourg ,2012	11.57	179.45	191.02	6.1%	93.9%
Malta, 2010	1.65	25.93	27.58	6.0%	94.0%
Netherlands, 2012	253.48	1,460.69	1,714.17	14.8%	85.2%
Poland, 2010	109.32	761.14	870.45	12.6%	87.4%
Portugal, 2008	64.37	337.67	402.04	16.0%	84.0%
Romania, 2011	40.67	283.27	323.94	12.6%	87.4%
Slovakia, 2011	27.70	194.49	222.19	12.5%	87.5%
Slovenia, 2010	12.03	80.70	92.73	13.0%	87.0%
Spain, 2010	364.54	1,955.15	2,319.69	15.7%	84.3%
Sweden, 2011	145.02	750.86	895.88	16.2%	83.8%
UK, 2010	736.35	3,065.67	3,802.02	19.4%	80.6%
EU28 (based on sum of the values above)	4,505.20	25,185.56	29,690.78	15.2%	84.8%
EU28, (based on aggregate data for 2012)	4,491.17	21,749.95	26,241.12	17.1%	82.9%
Non-EU					
Canada*, 2011	427.21	1,971.73	2,398.94	17.8%	82.2%
China**, 2007	679.72	3,040.52	3,720.24	18.3%	81.7%
Japan***, 2011	127.89	356.17	484.06	26.4%	73.6%
US, 2012	3,873.16	20,257.08	24,130.24	16.1%	83.9%
Switzerland, 2011	134.99	1,160.55	1,295.55	10.4%	89.6%
Norway, 2007	77.70	494.24	571.93	13.6%	86.4%

Source: London Economics based on Eurostat's supply, use and input-output tables and national statistical institutes for Japan, Canada, China and Switzerland. There are two ways in which the total for the EU28 can be calculated: (1) add all values for public sector and total use and divide the former by the latter, or (2) use more recent use table from Eurostat for the EU28 in 2012. The two values are provided in the table. The first one has the disadvantage of adding data from different years but is more consistent with the remaining data in the table. The second one has more recent data and uses data for a single year. The comparison between the two can be taken as some indication that, overall, the weight of the public sector has been increasing in the EU28.
*Definition of public sector for Canada defined as Utilities + 0.1*Transportation and warehousing + Education services + Health care and social assistance + government education services + government health services + Other federal government services + Other provincial and territorial government services + Other municipal government services + Other aboriginal government services
** Definition of public sector for China is defined as Government consumption expenditure+ production and supply of electric power, heat power and water*0.5 + Transport, storage, post, information transmission, computer services & software*0.1 + other services*0.1
*** Definition of public sector for Japan: Consumption expenditure of general government + Public administration+ Social insurance and social welfare + Education + Medical service+ Health and hygiene + Nursing care+ Electricity + Gas and heat supply + Water supply + Waste management service + 1/3*Road transport (except self-transport) + 1/3*Water transport
No data available for the postal and telecommunications sectors in Luxembourg

Table 2 demonstrates that the products which constitute a **large share of total demand in the public sector** are products where **the share of public sector demand in total use is high**. This indicates that goods and services on which the public sector spends the most of its budget correspond also to goods and services that are predominantly supplied to the economy by the public sector.

The main examples are, unsurprisingly, public administration and defence services, social security services, education services, and human health services. For all of these, the public sector represents more than ¾ of total use and, when added together, these sectors represent just ½ of the public sector's total expenditure, at the EU28 level.

Table 2: Public sector and total demand by product, EU28, 2012

Products	Value (Bn EUR)		Share of:	
	Total use	Public sector	public sector demand in total use	product in total demand of the public sector
Products of agriculture, hunting and related services	414.34	3.31	0.8%	0.1%
Products of forestry, logging and related services	34.72	1.63	4.7%	0.0%
Fish and other fishing products; aquaculture products; support services to fishing	14.97	0.17	1.1%	0.0%
Mining and quarrying	575.38	122.39	21.3%	2.7%
Food, beverages and tobacco products	1,000.72	25.37	2.5%	0.6%
Textiles, wearing apparel, leather and related products	302.96	5.79	1.9%	0.1%
Wood and of products of wood and cork, except furniture; articles of straw and plaiting materials	113.58	2.18	1.9%	0.0%
Paper and paper products	169.61	7.33	4.3%	0.2%
Printing and recording services	84.13	8.91	10.6%	0.2%
Coke and refined petroleum products	522.03	37.95	7.3%	0.8%
Chemicals and chemical products	554.01	18.51	3.3%	0.4%
Basic pharmaceutical products and pharmaceutical preparations	224.85	96.82	43.1%	2.2%
Rubber and plastic products	263.65	7.63	2.9%	0.2%
Other non-metallic mineral products	189.97	5.02	2.6%	0.1%
Basic metals	448.64	5.55	1.2%	0.1%
Fabricated metal products, except machinery and equipment	454.78	13.4	2.9%	0.3%
Computer, electronic and optical products	415.74	34.12	8.2%	0.8%
Electrical equipment	295.83	12.13	4.1%	0.3%
Machinery and equipment n.e.c.	592.89	7.26	1.2%	0.2%
Motor vehicles, trailers and semi-trailers	630.23	4.34	0.7%	0.1%
Other transport equipment	246.61	9.65	3.9%	0.2%
Furniture and other manufactured goods	245.82	22.03	9.0%	0.5%
Repair and installation services of machinery and equipment	231.54	21.43	9.3%	0.5%
Electricity, gas, steam and air conditioning	703.82	253.4	36.0%	5.6%
Natural water; water treatment and supply services	58.72	10.19	17.4%	0.2%
Sewerage services; sewage sludge; waste collection, treatment and disposal services; materials recovery services; remediation services and other ...	236.3	87.44	37.0%	1.9%
Constructions and construction works	1,699.74	67.21	4.0%	1.5%
Wholesale and retail trade and repair services of motor vehicles and motorcycles	393.52	19.91	5.1%	0.4%
Wholesale trade services, except of motor vehicles and motorcycles	1,268.50	93.02	7.3%	2.1%
Retail trade services, except of motor vehicles and motorcycles	844.08	41.6	4.9%	0.9%
Land transport services and transport services via	588.74	81.23	13.8%	1.8%

Products	Value (Bn EUR)		Share of:	
	Total use	Public sector	public sector demand in total use	product in total demand of the public sector
pipelines				
Water transport services	132.8	2.32	1.7%	0.1%
Air transport services	132.79	6.63	5.0%	0.1%
Warehousing and support services for transportation	491.66	69.96	14.2%	1.6%
Postal and courier services	105.09	17.64	16.8%	0.4%
Accommodation and food services	691.13	31.17	4.5%	0.7%
Publishing services	164.56	17.83	10.8%	0.4%
Motion picture, video and television programme production services, sound recording and music publishing; programming and broadcasting services	141.93	13.13	9.3%	0.3%
Telecommunications services	367.46	49.96	13.6%	1.1%
Computer programming, consultancy and related services; Information services	532.42	38.68	7.3%	0.9%
Financial services, except insurance and pension funding	757.15	51.32	6.8%	1.1%
Insurance, reinsurance and pension funding services, except compulsory social security	334.23	14.96	4.5%	0.3%
Services auxiliary to financial services and insurance services	214.96	2.73	1.3%	0.1%
Imputed rents of owner-occupied dwellings	0	0		0.0%
Real estate services excluding imputed rents	1,812.95	80.69	4.5%	1.8%
Legal and accounting services; services of head offices; management consultancy services	712.4	60.89	8.5%	1.4%
Architectural and engineering services; technical testing and analysis services	343.97	32.56	9.5%	0.7%
Scientific research and development services	309.36	34.39	11.1%	0.8%
Advertising and market research services	188.62	14.13	7.5%	0.3%
Other professional, scientific and technical services and veterinary services	147.32	17.18	11.7%	0.4%
Rental and leasing services	323.44	28.18	8.7%	0.6%
Employment services	166.02	23.29	14.0%	0.5%
Travel agency, tour operator and other reservation services and related services	105.77	3.76	3.6%	0.1%
Security and investigation services; services to buildings and landscape; office administrative, office support and other business support services	440.67	70.39	16.0%	1.6%
Public administration and defence services; compulsory social security services	1,078.40	1,000.86	92.8%	22.3%
Education services	742.53	569.94	76.8%	12.7%
Human health services	923.54	751.91	81.4%	16.7%
Residential care services; social work services without accommodation	382.74	248.53	64.9%	5.5%
Creative, arts, entertainment, library, archive, museum, other cultural services; gambling and betting services	188.09	55.85	29.7%	1.2%
Sporting services and amusement and recreation services	110.77	29.48	26.6%	0.7%
Services furnished by membership organisations	126.97	12.71	10.0%	0.3%
Repair services of computers and personal and household goods	36.49	4.34	11.9%	0.1%
Other personal services	162.26	7.0	4.3%	0.2%

Products	Value (Bn EUR)		Share of:	
	Total use	Public sector	public sector demand in total use	product in total demand of the public sector
Services of households as employers; undifferentiated goods and services produced by households for own use	52.2	1.78	3.4%	0.0%
Services provided by extraterritorial organisations and bodies	0.04	0.04	100.0%	0.0%
Total	26,241.12	4,491.17	17.1%	100.00%

Source: London Economics based on Eurostat's supply, use and input-output tables.

2.4. Import penetration from trade data

This subsection makes use of trade data and of the input-output framework from Eurostat in particular to describe the structure and trends of import penetration in public and private sector purchasing.

A shown by Figure 1 below, import penetration across EU countries and a selection of their main trading partners varies substantially.

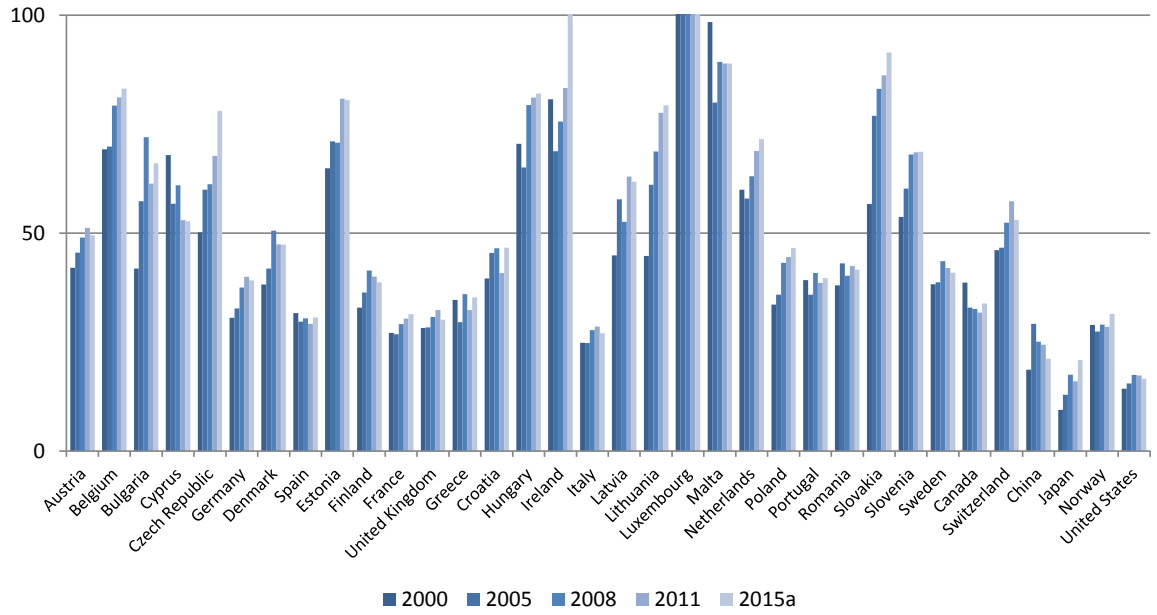
In 2015, the country with the highest import penetration was Luxembourg, which is likely to reflect its small economic size. It was closely followed by Ireland, Slovakia, Malta and Belgium. In contrast, Italy, Spain, France and the UK had the lowest level of import penetration among the European countries. Outside this group, China, Japan and the US are the more notable examples of low import penetration.

Across EU countries and a selection of their main trading partners, the long-term trend of import penetration is an increasing one.

Indeed, particularly significant increases in import penetration have occurred since 2000 in Luxembourg, Slovakia, Lithuania, the Czech Republic, Bulgaria and Ireland. Some decreases should also be pointed out, most noticeably in Cyprus, Malta, and, to a smaller extent, Spain.

The figure below illustrates these trends with data from the World Bank.

Figure 1: Import penetration at the country level several years between 2000 and 2015



Source: World Bank, World Development Indicators: Structure of demand; http://data.worldbank.org/indicator/NE.IMP.GNFS.ZS
Note: Values for 2015 are either 2015 data or latest available for each country. Values for Luxembourg reach outside the graph's scale and are excluded for readability (the original values range from 121% to 177% over the period).

The more recent evolution in import penetration confirms the upward trends but some downward changes in import penetration also become visible in for instance, Cyprus, Denmark, Finland and Sweden. This may be partly explained by the difficult economic climate following 2008.

2.4.1. Extra-EU versus intra-EU import penetration

The **intra-EU and extra-EU import shares show considerable country-level variation**: in 2015, for example, the share of intra-EU imports varies from 46% in the Netherlands to 82% in Estonia.

Despite this heterogeneity, it can be noted that, for the majority of EU28 countries, the bulk of imports are from within the EU, and that this trend has not seen major shifts in the recent years.

Table 3: Evolution of Intra-EU imports, EU28

Country	2010	2011	2012	2013	2014	2015
Austria	78.0%	77.4%	76.5%	76.6%	76.8%	76.8%
Belgium	69.1%	67.7%	67.6%	66.4%	65.0%	63.2%
Bulgaria	58.7%	59.5%	58.8%	59.7%	61.7%	64.4%
Croatia	60.2%	61.8%	62.5%	66.9%	76.2%	77.7%
Cyprus	70.5%	69.2%	69.2%	70.5%	71.4%	73.6%
Czech R.	75.0%	74.7%	75.4%	76.8%	77.4%	77.2%
Denmark	69.9%	70.5%	70.8%	70.0%	69.4%	69.4%
Estonia	79.8%	76.4%	77.8%	82.1%	81.7%	81.8%
Finland	64.2%	61.5%	62.8%	66.3%	68.1%	73.0%
France	68.5%	67.4%	67.1%	67.8%	67.7%	68.3%
Germany	63.3%	63.5%	63.6%	64.7%	65.5%	65.7%
Greece	52.7%	51.6%	46.0%	47.3%	48.2%	52.9%
Hungary	68.0%	69.8%	70.7%	71.7%	75.2%	76.2%
Ireland	65.9%	66.4%	64.5%	67.3%	66.5%	65.6%
Italy	55.2%	54.1%	53.3%	55.4%	57.1%	58.5%

Country	2010	2011	2012	2013	2014	2015
Latvia	76.1%	77.7%	78.2%	80.0%	80.5%	79.5%
Lithuania	56.6%	56.8%	57.6%	60.3%	65.6%	67.0%
Luxembourg	80.2%	81.6%	77.2%	79.0%	80.0%	72.2%
Malta	70.2%	73.8%	77.1%	71.0%	62.7%	65.3%
Netherlands	46.9%	46.7%	45.4%	46.3%	45.8%	45.6%
Poland	70.8%	70.0%	67.7%	69.0%	69.6%	70.4%
Portugal	76.4%	73.3%	71.5%	72.0%	74.8%	76.5%
Romania	72.6%	72.8%	73.6%	75.8%	75.4%	77.1%
Slovakia	72.1%	73.3%	73.7%	74.3%	76.1%	78.7%
Slovenia	72.5%	72.2%	72.0%	70.1%	69.1%	70.0%
Spain	59.0%	56.9%	54.2%	55.3%	57.3%	61.0%
Sweden	67.1%	68.2%	67.3%	68.9%	68.8%	69.9%
United Kingdom	49.0%	48.3%	47.6%	51.8%	53.0%	53.7%
EU28	61.9%	61.4%	60.6%	62.1%	62.8%	63.4%

Source: ComExt, EU trade since 1988 by CN8 [DS-016890], queried from http://ec.europa.eu/eurostat/web/international-trade/data/database?p_p_id=NavTreeportletprod_WAR_NavTreeportletprod_INSTANCE_yMiooQ47vf0e&p_p_lifecycle=0&p_p_state=normal&p_p_mode=view&p_p_col_id=column-2&p_p_col_count=1
Note: Ratio of Intra EU28 imports to sum of Intra plus Extra EU28 imports. The EU28 aggregate is calculated in the same way from the country-level values.

2.4.2. Import penetration by intra-EU partner country

A further breakdown of intra-EU import penetration by Member State is available for EU countries from ComExt, as given in Table 4 overleaf.

In the table, import shares are given relative to total intra-EU import penetration in the EU of each importing EU country.

This breakdown demonstrates that penetration of imports from intra-EU trade partners varies across countries. This appears to depend on factors such as geography, language and culture. For instance, a high percentage of Portuguese intra-EU imports are from Spain and a high percentage of Irish intra-EU imports are from the UK.

It can also be observed that, for the majority of countries in the sample, Germany accounted for the highest percentage of intra EU imports. The other main intra-EU exporting countries are the Netherlands, France, the UK and Italy.

Table 4: Breakdown of intra EU imports by trading partner in 2015, importing countries in rows, partner countries in columns

	AT	BE	BG	HR	CY	CZ	DK	EE	FI	FR	DE	EL	HU	IE	IT	LT	LU	LV	NL	MT	PL	PT	RO	SK	SI	ES	SE	UK
AT		3%	0%	0%	0%	5%	1%	0%	0%	3%	54%	0%	3%	0%	8%	0%	0%	0%	5%	0%	3%	0%	1%	3%	2%	2%	1%	2%
BE	1%		0%	0%	0%	2%	1%	0%	1%	15%	20%	0%	1%	8%	6%	0%	1%	0%	27%	0%	2%	1%	0%	0%	0%	3%	3%	8%
BG	4%	4%		0%	0%	3%	1%	0%	0%	5%	20%	8%	6%	0%	12%	0%	0%	0%	5%	0%	5%	0%	11%	2%	1%	7%	1%	3%
HR	12%	2%	1%		0%	3%	1%	0%	0%	3%	20%	1%	10%	0%	17%	0%	0%	0%	5%	0%	4%	0%	1%	2%	14%	3%	1%	1%
CY	1%	4%	2%	0%		1%	1%	0%	0%	5%	10%	35%	0%	0%	11%	0%	0%	0%	6%	0%	1%	0%	2%	0%	0%	5%	1%	12%
CZ	5%	3%	0%	0%	0%		1%	0%	0%	4%	39%	0%	4%	1%	5%	0%	0%	0%	6%	0%	12%	0%	1%	9%	1%	2%	1%	3%
DK	1%	4%	0%	0%	0%	2%		1%	2%	4%	29%	0%	1%	2%	5%	1%	0%	1%	12%	0%	5%	1%	0%	1%	0%	2%	18%	6%
EE	1%	2%	0%	0%	0%	2%	2%		18%	2%	13%	0%	2%	0%	3%	11%	0%	10%	7%	0%	9%	0%	0%	1%	0%	2%	10%	3%
FI	2%	5%	0%	0%	0%	2%	6%	4%		5%	23%	0%	1%	1%	3%	1%	0%	1%	12%	0%	3%	1%	0%	0%	0%	3%	22%	4%
FR	2%	16%	0%	0%	0%	2%	1%	0%	1%		28%	0%	1%	2%	11%	0%	1%	0%	11%	0%	3%	2%	1%	1%	0%	10%	2%	6%
DE	6%	9%	0%	0%	0%	7%	2%	0%	1%	12%		0%	4%	2%	8%	0%	1%	0%	21%	0%	8%	1%	2%	2%	1%	4%	2%	6%
EL	2%	6%	6%	0%	1%	1%	2%	0%	0%	8%	20%		2%	1%	16%	0%	1%	0%	10%	0%	2%	1%	3%	1%	1%	7%	1%	5%
HU	9%	3%	1%	1%	0%	6%	1%	0%	0%	7%	34%	0%		1%	6%	0%	0%	0%	6%	0%	7%	0%	4%	7%	2%	2%	1%	2%
IE	0%	3%	0%	0%	0%	1%	1%	0%	1%	16%	14%	0%	0%		2%	0%	0%	0%	7%	0%	1%	0%	0%	0%	0%	2%	1%	48%
IT	4%	8%	1%	1%	0%	3%	1%	0%	1%	15%	26%	1%	2%	2%		0%	0%	0%	10%	0%	4%	1%	3%	1%	1%	9%	2%	5%
LT	2%	4%	0%	0%	0%	2%	3%	4%	3%	4%	17%	0%	1%	0%	7%		0%	11%	8%	0%	15%	0%	0%	1%	0%	3%	6%	4%
LU	1%	38%	0%	0%	0%	1%	0%	0%	0%	13%	32%	0%	0%	1%	3%	0%		0%	6%	0%	1%	0%	0%	0%	0%	1%	0%	2%
LV	2%	2%	0%	0%	0%	2%	3%	10%	7%	3%	14%	0%	1%	1%	5%	21%	0%		5%	0%	13%	0%	0%	1%	0%	2%	4%	3%
NL	1%	18%	0%	0%	0%	3%	2%	0%	2%	8%	32%	0%	1%	3%	4%	1%	0%	0%		0%	4%	1%	1%	1%	0%	4%	3%	11%
MT	1%	4%	1%	2%	0%	0%	1%	0%	0%	6%	10%	2%	0%	1%	35%	0%	0%	0%	13%		1%	0%	1%	0%	0%	6%	3%	11%
PL	3%	5%	0%	0%	0%	5%	2%	0%	1%	6%	39%	0%	2%	1%	7%	1%	0%	0%	8%	0%		0%	1%	4%	1%	3%	4%	4%
PT	1%	4%	0%	0%	0%	1%	1%	0%	0%	10%	17%	0%	1%	1%	7%	0%	0%	0%	7%	0%	1%		0%	0%	0%	43%	1%	4%
RO	5%	3%	4%	0%	0%	4%	1%	0%	0%	7%	26%	1%	10%	1%	14%	0%	0%	0%	5%	0%	6%	1%		3%	1%	3%	1%	3%
SK	12%	2%	0%	0%	0%	22%	1%	0%	0%	5%	25%	0%	8%	0%	4%	0%	0%	0%	3%	0%	8%	0%	2%		3%	1%	1%	2%
SI	15%	2%	0%	7%	0%	3%	0%	0%	0%	4%	24%	1%	5%	0%	20%	0%	0%	0%	4%	0%	3%	0%	2%	2%		2%	1%	2%
ES	1%	5%	0%	0%	0%	2%	1%	0%	1%	19%	24%	0%	1%	3%	11%	1%	0%	0%	8%	0%	3%	7%	1%	1%	0%		1%	8%
SE	2%	6%	0%	0%	0%	2%	11%	2%	7%	6%	26%	0%	1%	2%	5%	1%	0%	1%	12%	0%	5%	0%	0%	1%	0%	2%		8%
UK	1%	9%	0%	0%	0%	2%	2%	0%	1%	11%	28%	0%	1%	6%	7%	0%	0%	0%	14%	0%	4%	1%	1%	1%	0%	6%	3%	

Source: ComExt; EU trade since 1988 by HS6 [DS-016893], sourced from http://ec.europa.eu/eurostat/web/international-trade/data/database?p_p_id=NavTreeportletprod_WAR_NavTreeportletprod_INSTANCE_yMiooQ47vf0e&p_p_lifecycle=0&p_p_state=normal&p_p_mode=view&p_p_col_id=column-2&p_p_col_count=1.
Note: Importing countries on rows, imports from column country. Darker shades of green indicate larger shares of imports.

2.5. Import penetration from supply, use and input-output framework

2.5.1. Supply, use and input-output tables

The input-output framework of the European System of Accounts (ESA 2010) consists of three types of tables:

- supply tables;
- use tables; and
- symmetric input-output tables.

Supply and use tables provide a detailed picture of the supply of goods and services by domestic production and imports and the use of goods and services for intermediate consumption and final use (consumption, gross capital formation, exports).

In order to investigate the penetration of imports in the total purchases by a given sector, the content of the 'use' tables is most helpful.

As presented in Table 5 below, the use table shows the use of goods and services by type of use, i.e. as intermediate consumption by industry, final consumption by households and government, gross capital formation or exports.

In turn, this can be used to identify the use of goods and services by both the public and private sector.

Use tables also include a set of sub-tables specifically on the use of imports.

Therefore, where data is available, the use framework allows us to calculate **the penetration of imports in the private and public sector.** This is calculated by dividing the use values from the use of imports table by the corresponding use values from the total use table. In addition, this can be done on a product-by-product basis.

Table 5: Components of a use table

	INDUSTRIES (NACE) / PRODUCTS (CPA)	INPUT OF INDUSTRIES (NACE)							FINAL USES									Total use at purchasers' prices
		Agriculture	Industry	Construction	Trade, hotel, transport	Private services	Other services	Total	Final consumption expenditure by households	Final consumption expenditure by non-profit organisations	Final consumption expenditure by government	Gross fixed capital formation	Changes in valuables	Changes in inventories	Exports intra EU fob	Exportsextra EU fob	Total	
No		1	2	3	4	5	6	7	8	9	10	11	12	13	14	15	16	17
1	Products of agriculture	Intermediate consumption at purchasers' prices							Final demand at purchasers prices									
2	Products of industry																	
3	Construction work																	
4	Trade, hotel, transport services																	
5	Private services																	
6	Other services																	
7	Total																	
8	Cif/ fob adjustments on exports								Adjustment items									
9	Direct purchases abroad by residents																	
10	Domestic purchases. by non-residents																	
11	Total																	
12	Compensation of employees	Gross value added at basic prices																
13	Other net taxes on production																	
14	Consumption of fixed capital																	
15	Operating surplus, net																	
16	Gross Value added at basic prices																	
17	Output at basic prices																	

Source: Eurostat Manual of Supply, Use and Input-Output Tables, 2008.
Note: For our purposes the focus is on the top two matrices: imported products and services can be used as intermediate consumption by industry (top left) or as final consumption by households and government (top right). In order to compute the total public sector use, final government consumption (column 10) and intermediate consumption by the industries covered by the public sector are summed across products. The remainder of total use (column 17) is assumed to be private sector use. This process is repeated for both the total and import use tables. In turn, import shares could then be computed by dividing the use values for each sector from the use of imports table by the corresponding use values from the total use table.

The analysis in this section relies on the use table of imports where this is available. An alternative, when no use of imports information is provided, is to resort to the input-output tables. Input-output tables on symmetric product by product basis indicate the value of each (row) product as an input in the production of each (column) product. For some countries, domestic and imports input-output tables are provided. When no import use information is available, import penetration is estimated from the comparison of domestic and import input-output tables.[18]

2.5.2. Import penetration in the public sector from supply, use and input-output data

Table 6 below provides an overview of import penetration in the public sector purchasing by country, estimated from input-output and use tables.[19]

Import penetration in public sector use is estimated at 7.9% across the EU with import penetration at the Member State level ranging from 5.7% in Italy to 20.5% in Bulgaria. High levels of import penetration in the public sector seem to be a feature of Eastern European countries, such as Slovakia, the Czech Republic and Latvia.

18 Please see annex 6.1 for a summary of the availability of import use & IOT data at the country level.
19 Method used is discussed in annex 6.1.

In general, public sector import penetration appears to be lower in larger countries such as Italy and Germany. In addition, relatively low values are also found in the Netherlands, Denmark and Sweden.

Table 6: Import penetration in public and private sector use, per country

Country	Public sector imports (Bn EUR)	Public sector use (Bn EUR)	Private sector imports (Bn EUR)	Private sector use (Bn EUR)	Public sector import penetration	Private sector import penetration
Austria,2012	10.99	105.70	144.70	645.23	10.4%	22.4%
Belgium, 2010	11.06	125.77	255.43	889.64	8.8%	28.7%
Bulgaria, 2010	2.40	11.73	17.98	84.75	20.5%	21.2%
Croatia, 2010	1.50	15.13	15.50	78.39	9.9%	19.8%
Cyprus	-	-	-	-	-	-
Czech R., 2012	9.74	58.28	104.88	438.64	16.7%	23.9%
Denmark, 2011	6.69	94.50	104.92	453.48	7.1%	23.1%
Estonia, 2011	0.85	5.57	12.16	41.84	15.3%	29.1%
Finland, 2011	5.62	73.90	71.59	383.67	7.6%	18.7%
France, 2012	63.13	746.17	551.04	3,609.06	8.5%	15.3%
Germany, 2011	56.10	812.57	963.47	5,314.21	6.9%	18.1%
Greece, 2010	7.07	69.11	60.16	354.87	10.2%	17.0%
Hungary, 2012	4.31	31.24	74.52	248.37	13.8%	30.0%
Ireland, 2011	7.25	46.53	125.14	417.24	15.6%	30.0%
Italy, 2012	29.95	526.65	400.91	3,036.65	5.7%	13.2%
Latvia,1998	0.21	1.27	1.98	8.22	16.3%	24.1%
Lithuania, 2010	1.14	9.42	17.38	58.70	12.1%	29.6%
Luxembourg	-	-	-	-	-	-
Malta, 2010	0.12	1.65	9.86	25.93	7.3%	38.0%
Netherlands, 2012	17.13	253.48	441.24	1,460.69	6.8%	30.2%
Poland, 2010	8.54	109.32	139.12	761.14	7.8%	18.3%
Portugal, 2008	6.09	64.37	65.68	337.67	9.5%	19.5%
Romania	-	-	-	-	-	-
Slovakia, 2011	4.71	27.70	53.80	194.49	17.0%	27.7%
Slovenia, 2010	1.49	12.03	21.00	80.70	12.4%	26.0%
Spain, 2010	29.78	364.54	251.59	1,955.15	8.2%	12.9%
Sweden, 2011	8.39	145.02	161.60	750.86	5.8%	21.5%
UK	-	-	-	-	-	-
EU, weighted average latest available*	-	-	-	-	7.9%	18.8%
Non-EU						
Canada		-		-	-	-
China		-		-	-	-
Japan		-		-	-	-
Norway, 2007	4.50	77.70	81.79	494.24	5.8%	16.5%
Switzerland		-		-	-	-
US		-		-	-	-

Source: London Economics based on Eurostat's supply, use and input-output tables.
Notes: Import penetration columns are calculated as the ratio of imports to total use. *Aggregate values for EU28 are based on latest available data for each Member State as depicted in the table. UK, US, Japan, Canada, China, Cyprus, Luxembourg & Romania are excluded as public sector import consumption is not available.

Private sector import penetration was consistently higher than public sector import penetration both in the EU and non-EU countries considered. At the EU level, in particular, it is estimated that the share of imports in private sector use is just over ten percentage points higher than for the public sector, at 18.8% versus 7.9%. The difference between private sector and public sector import penetration is greatest in Malta, the Netherlands and Belgium.

However, this result does not necessarily indicate that public sector contractors are biased towards domestic purchasing. Instead, it is a reflection of the differences in the types of purchases made in the public and private sectors. Indeed, the public sector is more likely to provide and purchase services relative to the economy as a whole. In turn, as services are less likely to be purchased across borders, this can explain the gap between the import penetration in the private and public sectors. This hypothesis is discussed in more depth in the sub-section below.

2.5.3. Import penetration in the public sector at the product level

At the product level, import penetration is analysed at the Classification of Products by Activity (CPA) level.[20] Table 7 below gives the breakdown of public sector import penetration by country and product. It illustrates significant divergences per country, per product, penetration of public sector. Products which tend to have high public sector import penetration include mining, pharmaceuticals, metals, textiles, furniture, chemicals, electronics, machinery and transport equipment.

On the other hand, import penetration in more service-orientated products is much lower across the board. This is unsurprising as the provision of services is more likely to be dependent on geographical proximity and language barriers. Furthermore, certain services are inherently non-tradable since they cannot be produced and delivered in separate locations.

Nonetheless, some import penetration is found in 'water and air transport services', 'accommodation and food', 'publishing', 'insurance and advertising'. However, it is worthwhile to point out that some products where public sector import penetration appears high represent only a very small share of public sector total use.

Across countries, Ireland and Malta are the two countries with more important public sector purchasing from abroad in relation to services.

In Table 8 below, the difference between public and private sector import penetration by product is also given. Darker shading indicates that public sector import penetration was larger than the private sector.

It can be observed that at the product level import penetration is actually more often higher in the public sector than in the private sector especially in sectors such as refined petroleum, chemicals, pharmaceuticals, rubber and plastic, basic metals, electrical equipment, and air transport. The table shows that public sector purchasing in these sectors has greater cross-border preponderance than private purchasing in the same sectors. Most of these sectors, however, represent a relatively small share of public purchasing[21] compared to main sectors where public purchasing is mainly domestic such as security, public administration and defence, social security, education and health. These five sectors alone represent over 58% of public sector purchasing and are all heavily tilted towards domestic purchasing.

The analysis above therefore shows that higher import penetration in private sector purchasing is to a large extent explained by the significant differences in the composition of purchases.

20 A conversion has also been done between CPA and CPV sectors but because CPA data was only available at the top sector level, the conversion is far from precise. As a result, in this section import penetration will only be analysed at the CPA level but the breakdown at the CPV sector level will be included in the next section in order to compare import penetration in government spending and cross-border procurement data from TED.

21 Even pharmaceuticals represent only 2.2% of total public purchasing versus 16.7% for health services – which are mainly domestically purchased.

Table 7: Product-level import penetration in public sector use, EU28 and major non-EU trading partners

Product	AT	BE	BG	HR	CZ	CY	DK	EE	FI	FR	DE	EL	HU	IE	IT	LV	LT	LU	MT	NL	PL	PT	RO	SK	SI	ES	SE	UK	EU	CA	CN	JP	NO	CH	US
Products of agriculture, hunting and related services	56%	11%	10%	13%	23%	-	25%	71%	31%	8%	47%	15%	6%	0%	13%	6%	4%	-	0%	28%	51%	27%	-	32%	70%	9%	51%	-	27%	-	-	-	7%	-	-
Products of forestry, logging and related services	16%	44%	1%	2%	10%	-	0%	37%	22%	5%	83%	35%	0%	0%	0%	0%	16%	-	100%	40%	17%	0%	-	4%	14%	3%	10%	-	5%	-	-	-	6%	-	-
services to fishing	0%	31%	27%	0%	50%	-	68%	36%	63%	43%	68%	12%	0%	0%	0%	0%	59%	-	7%	79%	0%	36%	-	50%	62%	0%	81%	-	34%	-	-	-	61%	-	-
Mining and quarrying	87%	99%	72%	71%	77%	-	31%	51%	81%	98%	81%	86%	85%	98%	84%	92%	99%	-	97%	68%	86%	99%	-	98%	63%	78%	84%	-	67%	-	-	-	38%	-	-
Food, beverages and tobacco products	39%	29%	27%	32%	43%	-	43%	42%	27%	20%	27%	30%	31%	85%	5%	5%	44%	-	92%	31%	41%	27%	-	58%	46%	8%	34%	-	21%	-	-	-	8%	-	-
Textiles, wearing apparel, leather and related products	91%	58%	50%	96%	92%	-	81%	88%	67%	72%	68%	44%	59%	96%	11%	25%	23%	-	95%	84%	90%	39%	-	82%	67%	16%	85%	-	52%	-	-	-	65%	-	-
straw and plaiting materials	31%	58%	23%	69%	24%	-	46%	2%	2%	28%	17%	24%	29%	52%	36%	14%	18%	-	45%	54%	29%	16%	-	28%	54%	14%	15%	-	19%	-	-	-	15%	-	-
Paper and paper products	82%	61%	52%	45%	74%	-	74%	96%	25%	33%	35%	62%	40%	87%	8%	58%	71%	-	71%	44%	71%	39%	-	76%	92%	25%	44%	-	31%	-	-	-	11%	-	-
Printing and recording services	1%	1%	1%	9%	2%	-	1%	0%	17%	0%	4%	1%	0%	80%	0%	9%	1%	-	7%	2%	1%	2%	-	1%	1%	0%	0%	-	2%	-	-	-	4%	-	-
Coke and refined petroleum products	59%	29%	42%	27%	38%	-	74%	72%	45%	42%	43%	33%	52%	0%	26%	99%	0%	-	100%	70%	64%	27%	-	45%	100%	72%	52%	-	42%	-	-	-	12%	-	-
Chemicals and chemical products	79%	49%	62%	74%	86%	-	86%	91%	87%	62%	62%	68%	72%	100%	7%	92%	61%	-	56%	68%	90%	60%	-	90%	77%	32%	81%	-	54%	-	-	-	14%	-	-
Basic pharmaceutical products and pharmaceutical preparations	81%	69%	92%	30%	89%	-	71%	100%	77%	82%	58%	75%	83%	96%	66%	0%	79%	-	92%	67%	83%	67%	-	99%	77%	78%	0%	-	66%	-	-	-	38%	-	-
Rubber and plastic products	69%	62%	52%	58%	58%	-	65%	83%	56%	44%	44%	40%	79%	84%	2%	73%	63%	-	100%	79%	86%	81%	-	70%	78%	28%	66%	-	42%	-	-	-	18%	-	-
Other non-metallic mineral products	28%	29%	13%	36%	41%	-	50%	55%	38%	23%	10%	16%	49%	33%	4%	49%	57%	-	85%	39%	22%	27%	-	49%	35%	10%	44%	-	18%	-	-	-	18%	-	-
Basic metals	63%	34%	41%	88%	78%	-	70%	100%	100%	69%	46%	43%	81%	100%	41%	93%	97%	-	91%	100%	50%	74%	-	90%	56%	19%	60%	-	56%	-	-	-	22%	-	-
Fabricated metal products, except machinery and equipment	77%	33%	35%	37%	40%	-	21%	54%	73%	29%	34%	13%	52%	67%	2%	40%	42%	-	27%	32%	85%	50%	-	48%	47%	14%	26%	-	24%	-	-	-	15%	-	-
Computer, electronic and optical products	95%	77%	92%	40%	94%	-	71%	100%	72%	87%	36%	98%	85%	99%	45%	68%	54%	-	88%	73%	95%	82%	-	96%	100%	64%	84%	-	37%	-	-	-	48%	-	-
Electrical equipment	84%	55%	73%	52%	66%	-	90%	100%	96%	74%	38%	67%	87%	96%	30%	83%	54%	-	96%	79%	79%	69%	-	99%	97%	32%	79%	-	45%	-	-	-	40%	-	-
Machinery and equipment n.e.c.	93%	72%	74%	61%	81%	-	68%	100%	97%	77%	53%	78%	87%	99%	15%	79%	68%	-	85%	67%	91%	87%	-	96%	87%	78%	78%	-	63%	-	-	-	27%	-	-
Motor vehicles, trailers and semi-trailers	60%	64%	87%	51%	61%	-	76%	100%	92%	62%	40%	88%	79%	93%	7%	82%	56%	-	89%	89%	58%	83%	-	69%	58%	50%	64%	-	37%	-	-	-	31%	-	-
Other transport equipment	80%	73%	60%	8%	59%	-	80%	100%	44%	63%	28%	96%	69%	100%	19%	63%	46%	-	100%	83%	74%	89%	-	56%	34%	77%	70%	-	45%	-	-	-	15%	-	-
Furniture and other manufactured goods	72%	79%	43%	18%	69%	-	78%	85%	55%	75%	43%	75%	81%	0%	34%	73%	18%	-	35%	78%	75%	71%	-	93%	62%	30%	58%	-	55%	-	-	-	33%	-	-
Repair and installation services of machinery and equipment	1%	3%	11%	10%	6%	-	5%	0%	0%	4%	2%	0%	11%	0%	0%	67%	0%	-	3%	2%	1%	3%	-	0%	9%	0%	5%	-	2%	-	-	-	0%	-	-
Electricity, gas, steam and air conditioning	12%	53%	1%	15%	8%	-	14%	4%	10%	1%	2%	6%	15%	0%	7%	3%	17%	-	0%	4%	11%	7%	-	1%	21%	0%	4%	-	4%	-	-	-	0%	-	-
Natural water; water treatment and supply services	0%	0%	0%	0%	0%	-	0%	0%	0%	0%	0%	0%	0%	0%	2%	0%	0%	-	0%	2%	0%	0%	-	0%	0%	0%	0%	-	0%	-	-	-	0%	-	-
disposal services; materials recovery services; remediation services and other wa...	6%	40%	73%	7%	19%	-	19%	12%	26%	6%	15%	3%	7%	0%	4%	0%	63%	-	2%	5%	6%	18%	-	66%	59%	9%	19%	-	9%	-	-	-	4%	-	-
Constructions and construction works	1%	0%	3%	0%	3%	-	0%	0%	0%	0%	0%	1%	0%	0%	5%	0%	0%	-	1%	2%	1%	0%	-	5%	2%	0%	0%	-	1%	-	-	-	0%	-	-
motorcycles	1%	0%	0%	0%	4%	-	0%	0%	0%	0%	1%	0%	2%	0%	1%	2%	0%	-	8%	0%	0%	0%	-	0%	0%	0%	0%	-	0%	-	-	-	0%	-	-
Wholesale trade services, except of motor vehicles and motorcycles	1%	6%	0%	0%	1%	-	0%	0%	1%	4%	1%	0%	1%	52%	1%	0%	0%	-	0%	0%	0%	0%	-	0%	2%	2%	0%	-	3%	-	-	-	0%	-	-
Retail trade services, except of motor vehicles and motorcycles	0%	0%	0%	0%	0%	-	0%	0%	0%	0%	0%	0%	0%	0%	0%	0%	0%	-	0%	0%	0%	0%	-	0%	0%	0%	0%	-	0%	-	-	-	0%	-	-
Motion picture, video and television programme production services, sound recording and music publishing; programming and	39%	0%	2%	14%	5%	-	5%	9%	10%	6%	0%	4%	2%	0%	2%	12%	0%	-	100%	8%	49%	5%	-	1%	0%	0%	10%	-	2%	-	-	-	3%	-	-
Land transport services and transport services via pipelines	2%	14%	14%	31%	11%	-	8%	16%	4%	12%	2%	1%	3%	10%	3%	0%	8%	-	6%	8%	2%	3%	-	13%	11%	6%	5%	-	6%	-	-	-	0%	-	-
Water transport services	72%	80%	10%	15%	80%	-	2%	12%	55%	83%	14%	14%	81%	30%	3%	0%	73%	-	40%	8%	45%	28%	-	30%	69%	0%	56%	-	13%	-	-	-	0%	-	-
Air transport services	40%	63%	11%	34%	29%	-	64%	77%	45%	41%	10%	18%	74%	53%	25%	67%	76%	-	21%	28%	30%	29%	-	23%	76%	0%	65%	-	26%	-	-	-	14%	-	-
Warehousing and support services for transportation	2%	8%	17%	5%	2%	-	7%	16%	1%	13%	11%	51%	13%	0%	4%	3%	12%	-	3%	7%	2%	2%	-	5%	14%	1%	1%	-	6%	-	-	-	0%	-	-
Postal and courier services	19%	10%	0%	1%	17%	-	2%	45%	8%	8%	5%	3%	10%	40%	9%	11%	24%	-	12%	33%	19%	5%	-	3%	3%	0%	0%	-	9%	-	-	-	0%	-	-

Product	AT	BE	BG	HR	CZ	CY	DK	EE	FI	FR	DE	EL	HU	IE	IT	LV	LT	LU	MT	NL	PL	PT	RO	SK	SI	ES	SE	UK	EU	CA	CN	JP	NO	CH	US
Accommodation and food services	35%	23%	13%	64%	46%	-	0%	28%	2%	0%	67%	9%	3%	59%	6%	43%	7%	-	9%	18%	36%	19%	-	1%	31%	6%	0%	-	7%	-	-	-	0%	-	-
Publishing services	41%	31%	12%	7%	71%	-	14%	11%	6%	10%	10%	25%	9%	0%	8%	1%	2%	-	78%	11%	43%	16%	-	31%	26%	13%	12%	-	12%	-	-	-	2%	-	-
Telecommunications services	26%	25%	1%	13%	16%	-	11%	0%	4%	5%	3%	5%	14%	25%	8%	11%	10%	-	2%	28%	25%	13%	-	5%	19%	6%	2%	-	8%	-	-	-	0%	-	-
Computer programming, consultancy and related services; Information services	8%	14%	11%	11%	20%	-	20%	8%	21%	7%	18%	19%	19%	16%	5%	1%	6%	-	7%	12%	7%	10%	-	11%	14%	19%	13%	-	11%	-	-	-	4%	-	-
Financial services, except insurance and pension funding	20%	10%	11%	5%	4%	-	6%	25%	8%	4%	17%	12%	1%	33%	5%	0%	4%	-	1%	10%	18%	9%	-	21%	6%	11%	7%	-	8%	-	-	-	0%	-	-
Insurance, reinsurance and pension funding services, except	0%	7%	17%	9%	31%	-	6%	0%	5%	2%	3%	30%	4%	64%	40%	4%	11%	-	38%	12%	0%	22%	-	44%	5%	4%	1%	-	11%	-	-	-	7%	-	-
Services auxiliary to financial services and insurance services	0%	8%	0%	96%	4%	-	4%	0%	0%	0%	0%	0%	0%	8%	4%	0%	0%	-	28%	0%	0%	10%	-	9%	0%	3%	7%	-	3%	-	-	-	0%	-	-
Legal and accounting services; services of head offices; management	2%	15%	23%	17%	27%	-	13%	58%	23%	4%	4%	6%	5%	5%	2%	0%	4%	-	11%	18%	0%	6%	-	4%	12%	4%	24%	-	6%	-	-	-	3%	-	-
Architectural and engineering services; technical testing and analysis	15%	14%	29%	17%	7%	-	13%	11%	6%	14%	16%	4%	3%	15%	7%	0%	0%	-	5%	8%	8%	10%	-	6%	6%	5%	6%	-	10%	-	-	-	3%	-	-
Scientific research and development services	0%	12%	40%	1%	1%	-	26%	0%	0%	0%	0%	1%	0%	94%	14%	0%	0%	-	77%	0%	0%	3%	-	0%	0%	0%	0%	-	3%	-	-	-	0%	-	-
Advertising and market research services	0%	30%	5%	29%	11%	-	23%	22%	44%	21%	18%	5%	9%	91%	7%	0%	5%	-	76%	13%	0%	7%	-	2%	39%	5%	18%	-	12%	-	-	-	2%	-	-
Other professional, scientific and technical services and veterinary	1%	9%	0%	15%	4%	-	7%	14%	3%	0%	13%	11%	48%	83%	8%	5%	39%	-	51%	14%	0%	9%	-	57%	28%	0%	23%	-	12%	-	-	-	1%	-	-
Travel agency, tour operator and other reservation services and	0%	7%	69%	6%	22%	-	76%	0%	32%	0%	0%	2%	0%	0%	9%	0%	11%	-	81%	0%	0%	2%	-	0%	58%	7%	0%	-	8%	-	-	-	0%	-	-
Rental and leasing services	2%	18%	50%	13%	42%	-	5%	7%	26%	17%	3%	15%	36%	100%	11%	2%	7%	-	11%	27%	2%	10%	-	22%	57%	26%	24%	-	13%	-	-	-	0%	-	-
Employment services	0%	4%	0%	0%	3%	-	1%	21%	18%	0%	2%	0%	0%	0%	8%	0%	0%	-	1%	1%	0%	0%	-	0%	0%	0%	0%	-	1%	-	-	-	0%	-	-
Security and investigation services; services to buildings and	0%	15%	0%	0%	6%	-	10%	4%	0%	15%	3%	3%	0%	0%	3%	0%	0%	-	2%	1%	0%	2%	-	0%	0%	9%	6%	-	7%	-	-	-	0%	-	-
Public administration and defence services; compulsory social	0%	0%	0%	0%	0%	-	1%	0%	0%	0%	0%	0%	1%	0%	0%	14%	0%	-	3%	0%	0%	0%	-	0%	1%	0%	0%	-	0%	-	-	-	0%	-	-
Education services	0%	0%	4%	1%	0%	-	0%	1%	0%	0%	0%	0%	0%	0%	0%	0%	0%	-	0%	0%	0%	0%	-	1%	0%	0%	0%	-	0%	-	-	-	0%	-	-
Human health services	0%	0%	2%	0%	0%	-	0%	1%	0%	0%	0%	0%	1%	0%	0%	0%	0%	-	0%	0%	0%	0%	-	0%	0%	0%	0%	-	0%	-	-	-	0%	-	-
Imputed rents of owner-occupied dwellings	0%	0%	0%	0%	0%	-	0%	0%	0%	0%	0%	0%	0%	0%	0%	0%	0%	-	0%	0%	0%	0%	-	0%	0%	0%	0%	-	0%	-	-	-	0%	-	-
Residential care services; social work services without	0%	0%	0%	0%	0%	-	0%	0%	0%	0%	0%	0%	0%	0%	0%	0%	0%	-	0%	0%	0%	0%	-	0%	0%	0%	0%	-	0%	-	-	-	0%	-	-
Real estate services excluding imputed rents	0%	0%	0%	0%	1%	-	0%	7%	0%	0%	0%	0%	0%	0%	1%	0%	0%	-	4%	0%	0%	1%	-	0%	0%	0%	0%	-	0%	-	-	-	0%	-	-
Creative, arts, entertainment, library, archive, museum, other cultural	0%	1%	0%	1%	0%	-	1%	0%	0%	0%	0%	4%	0%	21%	0%	0%	1%	-	6%	0%	0%	12%	-	0%	0%	0%	0%	-	0%	-	-	-	1%	-	-
Sporting services and amusement and recreation services	1%	0%	12%	21%	0%	-	0%	0%	0%	0%	0%	7%	0%	8%	0%	0%	0%	-	61%	0%	0%	0%	-	6%	1%	0%	0%	-	0%	-	-	-	0%	-	-
Services furnished by membership organisations	0%	1%	0%	0%	0%	-	0%	0%	0%	0%	0%	0%	0%	0%	0%	0%	0%	-	28%	0%	0%	0%	-	0%	0%	0%	0%	-	0%	-	-	-	0%	-	-
Repair services of computers and personal and household goods	0%	27%	0%	0%	9%	-	0%	0%	0%	0%	0%	8%	0%	0%	21%	0%	0%	-	31%	7%	0%	0%	-	0%	0%	1%	0%	-	3%	-	-	-	4%	-	-
Other personal services	0%	1%	0%	0%	3%	-	0%	0%	0%	20%	0%	0%	0%	0%	0%	0%	0%	-	0%	0%	0%	1%	-	0%	0%	8%	0%	-	3%	-	-	-	0%	-	-
Services of households as employers; undifferentiated goods and	0%	0%	0%	0%	0%	-	0%	0%	0%	0%	0%	0%	0%	0%	0%	0%	0%	-	0%	0%	0%	0%	-	0%	0%	0%	0%	-	0%	-	-	-	0%	-	-
Services provided by extraterritorial organisations and bodies	0%	0%	0%	0%	0%	-	0%	0%	0%	0%	0%	0%	0%	0%	0%	0%	0%	-	0%	0%	0%	0%	-	0%	0%	0%	0%	-	100%	-	-	-	0%	-	-
Total	10%	9%	20%	10%	17%	-	7%	15%	8%	8%	7%	10%	14%	16%	6%	16%	12%	-	8%	7%	10%	9%	-	17%	12%	8%	6%	-	7%	-	-	-	4%	-	-

Source: London Economics based on Eurostat's supply, use and input-output tables.
Notes: Stronger green shades represent products with a higher share of import penetration in public sector use in the respective column country. UK, US, Japan, Canada, China, Cyprus, Luxembourg & Romania are excluded as public sector import consumption is not available; EU level import penetration is estimated from latest available year of all countries for which data is available.

Table 8: Difference in product-level import penetration between public and private sector use, EU28 and major non-EU trading partners

Product	AT	BE	BG	HR	CY	CZ	DK	EE	FI	FR	DE	EL	HU	IE	IT	LV	LT	LU	MT	NL	PL	PT	RO	ES	SI	SK	SE	UK	EU	CA	CN	JP	NO	CH	US
Products of agriculture, hunting and related services	27%	-34%	0%	0%	-	2%	6%	52%	9%	-4%	9%	2%	-6%		-6%	-7%	-22%	-	-37%	-9%	-8%	-3%	-	-7%	39%	6%	22%	-	3%	-	-	-	21%	-	-
Products of forestry, logging and related services	-4%	8%	0%	1%	-	1%	-12%	33%	15%	0%	67%	12%	-6%		-31%	-5%	9%	-	0%	-17%	-1%	-18%	-	-7%	4%	1%	2%	-	-6%	-	-	-	7%	-	-
Fish and other fishing products; aquaculture products; support services to fishing		-32%	0%	-7%	-	13%	28%	11%	19%	6%	11%	4%	-19%		-33%	-2%	-8%	-	-23%	14%	-30%	8%	-	-33%	5%	18%	-7%	-	-8%	-	-	-	-2%	-	-
Mining and quarrying	6%	2%	5%	2%	-	3%	10%	33%	-2%	9%	-10%	-1%	-4%	25%	-3%	11%	2%	-	88%	-2%	-26%	16%	-	-5%	6%	9%	18%	-	0%	-	-	-	6%	-	-
Food, beverages and tobacco products	9%	-4%	2%	11%	-	13%	15%	0%	2%	2%	4%	7%	6%	61%	-13%	-21%	10%	-	41%	-1%	-3%	-1%	-	-6%	9%	15%	0%	-	3%	-	-	-	-1%	-	-
Textiles, wearing apparel, leather and related products	21%	-2%	17%	51%	-	34%	0%	31%	-2%	7%	1%	-16%	-4%	8%	-14%	-13%	-30%	-	27%	4%	7%	7%	-	-35%	8%	20%	4%	-	13%	-	-	-	-1%	-	-
Wood and of products of wood and cork, except furniture; articles of straw and plaiting materials	14%	23%	-2%	36%	-	8%	6%	-16%	-8%	3%	-4%	1%	-7%	20%	17%	10%	-5%	-	-12%	3%	9%	1%	-	-5%	20%	8%	3%	-	-1%	-	-	-	1%	-	-
Paper and paper products	53%	12%	2%	-2%	-	30%	21%	46%	18%	-2%	7%	14%	-6%	17%	-13%	-14%	9%	-	-12%	-2%	5%	8%	-	-1%	54%	37%	32%	-	9%	-	-	-	32%	-	-
Printing and recording services	-2%	-6%	0%	8%	-	0%	-13%	-2%	1%	0%	-2%	0%	-2%	52%	0%	-7%	0%	-	5%	-2%	-1%	0%	-	0%	0%	0%	0%	-	-1%	-	-	-	7%	-	-
Coke and refined petroleum products	4%	-8%	15%	2%	-	8%	9%	-5%	18%	6%	5%	11%	18%		11%	7%		-	0%	22%	7%	3%	-	45%	0%	21%	18%	-	10%	-	-	-		-	-
Chemicals and chemical products	29%	5%	2%	13%	-	30%	31%	25%	44%	24%	25%	3%	23%	72%	-33%	20%	14%	-	-24%	25%	14%	8%	-	0%	15%	35%	36%	-	16%	-	-	-	24%	-	-
Basic pharmaceutical products and pharmaceutical preparations	37%	19%	30%	-32%	-	38%	53%	23%	27%	51%	11%	0%	44%	84%	25%		-17%	-	55%	-9%	9%	13%	-	27%	48%	34%		-	36%	-	-	-		-	-
Rubber and plastic products	24%	7%	10%	-1%	-	23%	14%	27%	25%	10%	17%	5%	38%	28%	-15%	1%	17%	-	49%	27%	13%	46%	-	-1%	43%	30%	21%	-	16%	-	-	-	12%	-	-
Other non-metallic mineral products	1%	0%	-9%	6%	-	16%	23%	18%	18%	1%	-9%	-2%	19%	5%	-7%	-3%	17%	-	41%	4%	1%	12%	-	-2%	2%	16%	15%	-	0%	-	-	-	8%	-	-
Basic metals	25%	-3%	16%	13%	-	26%	-2%	10%	69%	29%	9%	14%	20%	36%	6%	47%	9%	-	6%	34%	-21%	15%	-	-1%	6%	51%	27%	-	16%	-	-	-	23%	-	-
Fabricated metal products, except machinery and equipment	48%	0%	4%	-4%	-	14%	-5%	21%	55%	9%	17%	-9%	11%	27%	-5%	-7%	-4%	-	-18%	9%	35%	28%	-	-3%	20%	15%	5%	-	10%	-	-	-	18%	-	-
Computer, electronic and optical products	32%	-2%	12%	-40%	-	35%	6%	49%	13%	23%	-24%	5%	32%	59%	-10%	-20%	-23%	-	43%	0%	21%	21%	-	-9%	26%	37%	11%	-	4%	-	-	-	19%	-	-
Electrical equipment	41%	-7%	24%	12%	-	24%	37%	45%	59%	25%	6%	16%	44%	34%	3%	22%	-23%	-	44%	6%	28%	22%	-	-4%	64%	42%	27%	-	15%	-	-	-	5%	-	-
Machinery and equipment n.e.c.	52%	13%	12%	-9%	-	37%	47%	26%	62%	28%	28%	13%	30%	43%	-3%	0%	-16%	-	14%	18%	26%	17%	-	34%	38%	42%	41%	-	35%	-	-	-	6%	-	-
Motor vehicles, trailers and semi-trailers	11%	1%	22%	-31%	-	33%	-6%	26%	17%	18%	18%	3%	49%	14%	-32%	-14%	-30%	-	1%	16%	8%	26%	-	14%	10%	38%	25%	-	12%	-	-	-	-24%	-	-
Other transport equipment	41%	10%	14%	-19%	-	33%	9%	27%	9%	33%	-15%	0%	13%	6%	-6%	33%	-3%	-	0%	40%	9%	24%	-	47%	-20%	18%	33%	-	11%	-	-	-	41%	-	-
Furniture and other manufactured goods	30%	3%	3%	-41%	-	29%	33%	56%	13%	21%	3%	22%	43%		14%	16%	-7%	-	-11%	15%	25%	30%	-	-9%	21%	49%	16%	-	15%	-	-	-	18%	-	-
Repair and installation services of machinery and equipment	-13%	1%	1%	4%	-	2%	-2%	-5%	-1%	0%	0%	0%	-2%	0%	0%	-16%		-	-10%	-3%	0%	0%	-	0%	2%	0%	2%	-	-1%	-	-	-	37%	-	-
Electricity, gas, steam and air conditioning	12%	16%	0%	0%	-	1%	5%	-2%	1%	1%	-1%	0%	-4%	0%	7%	1%	11%	-	0%	-6%	-1%	7%	-	0%	4%	0%	-1%	-	0%	-	-	-	-1%	-	-
Natural water; water treatment and supply services	0%	0%	0%	0%	-	0%	0%			0%	0%	0%	0%	0%	2%	0%		-	0%	1%	0%	0%	-	0%	0%	0%	0%	-	0%	-	-	-	0%	-	-
Sewerage services; sewage sludge; waste collection, treatment and disposal services; materials recovery services; remediation services and other wa...	-23%	-5%	34%	4%	-	8%	12%	-18%	-7%	1%	-2%	-18%	-8%	0%	-11%	-22%	52%	-	-5%	-28%	0%	6%	-	-10%	18%	46%	2%	-	-6%	-	-	-	0%	-	-
Constructions and construction works	-1%	-3%	0%	0%	-	1%	-6%	-8%	0%	0%	0%	0%	-1%	0%	5%	-1%	0%	-	-1%	0%	-1%	0%	-	0%	1%	3%	0%	-	1%	-	-	-	0%	-	-
Wholesale and retail trade and repair services of motor vehicles and	0%	0%	0%	0%	-	2%	-1%	0%		0%	-1%	0%	1%	0%	1%	1%		-	8%	0%	0%	0%	-	0%	0%	0%	-2%	-	0%	-	-	-	-1%	-	-
Wholesale trade services, except of motor vehicles and motorcycles	-2%	1%	0%	0%	-	-1%	-5%		-1%	1%	-1%	0%	-3%	20%	-1%		-1%	-	-4%	-4%	-1%	-1%	-	1%	1%	-1%		-	-1%	-	-	-		-	-
Retail trade services, except of motor vehicles and motorcycles	0%	0%	0%	0%	-	0%	0%			0%	0%	0%	0%	0%	0%	0%		-	0%	0%	0%	0%	-	0%	0%	0%		-	0%	-	-	-	0%	-	-
Land transport services and transport services via pipelines	-24%	-4%	3%	19%	-	6%	-7%	9%	2%	0%	-9%	-1%	-8%	1%	1%	0%	3%	-	7%	-5%	0%	2%	-	1%	6%	7%	-9%	-	-3%	-	-	-	0%	-	-
Motion picture, video and television programme production services, sound recording and music publishing; programming and broadcasting services	17%	-18%	0%	6%	-	-6%	-2%	-10%	-4%	-4%	-10%	-15%	-27%		-5%	-26%	-14%	-	67%	-6%	-4%	-16%	-	-3%	-7%	-10%	2%	-	-8%	-	-	-	-18%	-	-
Water transport services	-23%	51%	-2%	10%	-	12%	-3%	-6%	24%	77%	4%	14%	39%	15%	2%		56%	-	22%	-9%	6%	19%	-	0%	36%	-26%	18%	-	3%	-	-	-	1%	-	-
Air transport services	20%	7%	0%	23%	-	10%	31%	40%	21%	17%	1%	4%	36%	30%	-21%	26%	30%	-	9%	15%		12%	-	-5%	35%	7%	17%	-	5%	-	-	-	7%	-	-
Warehousing and support services for transportation	-21%	-16%	8%	-7%	-	-8%	-69%	3%	-5%	2%	-1%	-9%	-15%	0%	-2%	-7%	1%	-	13%	-9%	-3%	-15%	-	-2%	6%	-3%	-6%	-	-10%	-	-	-	-38%	-	-
Postal and courier services	12%	0%	0%	0%	-	2%	0%	39%	3%	1%	0%	0%	-8%	15%	6%	5%	6%	-	-1%	22%		2%	-	-2%	0%	1%		-	3%	-	-	-	0%	-	-

Product	AT	BE	BG	HR	CY	CZ	DK	EE	FI	FR	DE	EL	HU	IE	IT	LV	LT	LU	MT	NL	PL	PT	RO	ES	SI	SK	SE	UK	EU	CA	CN	JP	NO	CH	US
Accommodation and food services	29%	10%	2%	61%	-	36%	0%	20%	-2%	0%	60%	9%	-3%	21%	3%	36%	0%	-	7%	2%	0%	16%	-	4%	19%	1%	0%	-	7%	-	-	-	5%	-	-
Publishing services	10%	-6%	-3%	-22%	-	45%	5%	-22%	2%	1%	-1%	5%	-16%		1%	-22%	-13%	-	41%	1%	-7%	-5%	-	1%	7%	6%	2%	-	-1%	-	-	-	-1%	-	-
Telecommunications services	20%	14%	0%	8%	-	9%	1%	-22%	-1%	0%	-3%	0%	6%	4%	2%	5%	1%	-	-13%	22%	-3%	8%	-	2%	3%	3%	-10%	-	2%	-	-	-	0%	-	-
Computer programming, consultancy and related services; Information services	-5%	6%	4%	1%	-	10%	-1%	-8%	10%	-2%	7%	3%	0%	14%	-1%	-22%	0%	-	-32%	-1%	-15%	1%	-	9%	2%	8%	5%	-	4%	-	-	-	-1%	-	-
Financial services, except insurance and pension funding	13%	4%	0%	-5%	-	0%	2%	17%	0%	0%	10%	1%	-1%	11%	2%	-5%	0%	-	-42%	4%	-3%	5%	-	6%	1%	18%	3%	-	3%	-	-	-	23%	-	-
Insurance, reinsurance and pension funding services, except compulsory social security	-9%	-1%	0%	4%	-	18%	2%	-8%	2%	1%	0%	4%	-8%	30%	30%	-34%	0%	-	2%	11%	-4%	18%	-	2%	1%	29%	-3%	-	5%	-	-	-	4%	-	-
Services auxiliary to financial services and insurance services	-2%	0%	0%	21%	-	0%	1%	-4%	0%	0%	0%	0%	-1%	1%	-3%	0%	0%	-	14%	-2%	2%	0%	-	1%	0%	2%	1%	-	0%	-	-	-	0%	-	-
Legal and accounting services; services of head offices; management consultancy services	-8%	-3%	2%	0%	-	3%	2%	27%	-3%	-1%	-12%	0%	-22%	-8%	-1%		-3%	-	-30%	-8%	-10%	0%	-	-2%	2%	0%	5%	-	-5%	-	-	-		-	-
Architectural and engineering services; technical testing and analysis services	8%	2%	3%	4%	-	-1%	4%	-4%	-4%	2%	3%	0%	-7%	4%	5%		-3%	-	-43%	4%	-4%	1%	-	0%	1%	-2%	-8%	-	2%	-	-	-		-	-
Scientific research and development services	-8%	-25%	1%	-16%	-	-16%	-4%	-4%	-23%	-10%	-10%	-7%	-7%	14%	10%	-35%		-	57%		-4%	-2%	-	-4%	-7%	-4%	-21%	-	-10%	-	-	-	-7%	-	-
Advertising and market research services	-18%	6%	0%	9%	-	1%	2%	9%	7%	3%	2%	0%	-9%	23%	-1%		0%	-	1%	-1%	-1%	0%	-	-2%	8%	0%	-1%	-	-3%	-	-	-		-	-
Other professional, scientific and technical services and veterinary	-3%	2%	0%	3%	-	0%	4%	9%	1%	0%	2%	1%	3%	22%	1%	-9%	21%	-	-26%	2%	5%	3%	-	0%	11%	27%	4%	-	-1%	-	-	-	0%	-	-
Rental and leasing services	-11%	3%	4%	2%	-	8%	2%	-24%	1%	4%	-1%	4%	-12%	24%	-6%	0%	1%	-	-44%	-31%	-3%	-5%	-	2%	6%	2%	10%	-	-21%	-	-	-	0%	-	-
Employment services	-2%	0%	0%	0%	-	0%	-4%	20%	-6%	0%	-1%	0%	0%	0%	-2%			-	-2%	-1%	0%	0%	-	0%	0%	0%	0%	-	-1%	-	-	-		-	-
Travel agency, tour operator and other reservation services and related services	-2%	5%	19%	4%	-	15%	32%		-1%	0%	0%	2%	0%	0%	-1%		0%	-	83%	0%	3%	1%	-	3%	37%	0%	0%	-	7%	-	-	-		-	-
Security and investigation services; services to buildings and landscape; office administrative, office support and other business support services	-4%	4%	0%	0%	-	4%	-14%	4%	-1%	1%	-1%	0%	0%	0%	-2%			-	-11%	-3%	1%	0%	-	-3%	0%	0%	-3%	-	-3%	-	-	-		-	-
Public administration and defence services; compulsory social security services	0%	0%	0%	-47%	-	-6%	-1%	0%	0%	0%	0%	0%	1%	0%	0%	14%	-47%	-	0%	-1%	0%	0%	-	0%	-20%	-4%	-1%	-	0%	-	-	-	0%	-	-
Education services	-2%	-1%	1%	0%	-	-1%	-10%	-9%	0%	0%	0%	0%	-2%	0%	0%	0%	0%	-	-3%	0%	-3%	0%	-	0%	-1%	-1%	-4%	-	-1%	-	-	-	0%	-	-
Human health services	0%	0%	0%	-1%	-	0%	-1%	0%	0%	0%	0%	0%	1%	0%	0%		-1%	-	0%	0%	-2%	0%	-	0%	-2%	0%	0%	-	0%	-	-	-		-	-
Imputed rents of owner-occupied dwellings					-													-					-					-		-	-	-		-	-
Residential care services; social work services without accommodation	-10%	0%	0%	0%	-	0%	0%			0%	0%		0%		0%	0%		-	-2%	0%	0%	0%	-	0%	0%	0%	0%	-	0%	-	-	-	0%	-	-
Real estate services excluding imputed rents	0%	0%	0%	0%	-	0%	0%	7%		0%	0%	0%	0%	0%	0%			-	3%	0%	1%	1%	-	0%	0%	0%	0%	-	0%	-	-	-		-	-
Creative, arts, entertainment, library, archive, museum, other cultural services; gambling and betting services	-10%	-7%	0%	-8%	-	-2%	-3%	-2%	-5%	-3%	-3%	-4%	0%	4%	-5%	-2%	-10%	-	6%	-7%	-10%	-2%	-	-4%	-1%	0%	-3%	-	-5%	-	-	-	-6%	-	-
Sporting services and amusement and recreation services	0%	0%	1%	19%	-	0%	-1%	-1%	-1%	0%	0%	9%	-5%	1%	0%	-2%	-7%	-	56%	0%	-5%	0%	-	0%	-1%	-1%	0%	-	-1%	-	-	-	-5%	-	-
Services furnished by membership organisations	0%	0%	0%	0%	-	-1%	0%			0%	0%	0%	0%	0%	0%	0%		-	26%	0%	0%	0%	-	0%	0%	0%	0%	-	0%	-	-	-	0%	-	-
Repair services of computers and personal and household goods	-1%	17%	0%	0%	-	3%				0%	0%	1%	-6%	0%	14%			-	26%	-2%	0%	0%	-	0%	0%	0%	0%	-	4%	-	-	-		-	-
Other personal services	-1%	1%	0%	0%	-	3%	-31%	0%		8%	0%	0%	-5%	0%	0%	0%		-	-1%	-4%	-2%	1%	-	0%	0%	0%	0%	-	-1%	-	-	-	-6%	-	-
Services of households as employers; undifferentiated goods and services produced by households for own use					-		0%			0%								-		0%			-					-	0%	-	-	-		-	-
Services provided by extraterritorial organisations and bodies					-													-					-					-		-	-	-		-	-
Total	-12%	-20%	-1%	-10%	-	-7%	-16%	-14%	-11%	-7%	-11%	-7%	-16%	-14%	-8%	-8%	-17%	-	-31%	-23%	-10%	-10%	-	-5%	-14%	-11%	-16%	-	-11%	-	-	-	-11%	-	-

Source: London Economics based on Eurostat's supply, use and input-output tables.
Notes: Green shading indicates that public sector import penetration is greater than private sector import penetration and grey shading indicates that public sector import penetration lower than private sector import penetration or no difference between public and private sector import penetration. Empty cells indicate that either the public or private sector does not import this product
UK, US, Japan, Canada, China, Cyprus, Luxembourg & Romania are excluded as public sector import consumption is not available and are indicated by a dash. EU level import penetration is estimated from latest available year of all countries for which data is available

It is interesting to note, in relation to Table 8 that it is more often the case that import penetration is higher in public sector purchasing than in private sector purchasing. There is therefore no indication of domestic bias in public purchasing despite of the fact that overall import penetration in private purchasing is significantly higher than for the public sector. Composition of public sector purchasing is therefore a more important explanation for the observed pattern.

Sectors where we observe significantly less cross-border purchasing by the public sector than by the private sector include: transport services, professional services and research, public administration, education and health, and arts and sports. Some of these have a disproportionate weight in total public sector demand: e.g. just public administration, education and health take up over 50% of total public expenditure. These include services that, by their nature, cannot easily be imported, directly, from a provider located abroad. They are potentially suitable for indirect cross-border procurement but not for direct cross-border procurement.[22]

2.6. Measuring the change in import penetration over time

As shown by Table 9 below, there appear to be no **particular patterns** in the evolution of import penetration over time.

This may be because the change in import penetration could not be measured during a consistent period across countries due to variability in availability of input-output and use tables.

Indeed, results are likely to vary with the period considered. For instance, the changes in import penetration are likely to differ if measured over periods of significant economic downturn.

The main conclusion that can be drawn from this analysis is that the **changes in public sector import penetration** over time have generally been **moderate.** Indeed, across all of our estimates, the changes in import penetration have varied from -3.5% in Poland to +2% in Germany.

Table 9: Change in public sector import penetration, per country

Country	Change in public sector import penetration
Austria (2010-2012)	-1.3%
Belgium (2005-2010)	-1.6%
Bulgaria	-
Croatia	
Czech R. (2005-2010)	-2.4%
Cyprus	-
Denmark (2008-2010)	-0.1%
Estonia (2010-2011)	-0.5%
Finland (2010-2011)	0.1%
France (2010-2012)	-0.7%
Germany (2007-2010)	2.0%
Greece	
Hungary (2010-2012)	-2.1%
Ireland (2010-2011)	0.6%
Italy (2010-2012)	-0.2%
Latvia (1996-1998)	0.4%
Lithuania (2005-2010)	0.7%
Luxembourg	-

22 The precise definitions of these terms are provided at the outset of section 3.

Country	Change in public sector import penetration
Malta	
Netherlands (2010-2012)	0.0%
Poland (2005-2010)	-3.5%
Portugal (2005-2008)	-1.2%
Romania	-
Slovakia (2010-2012)	0.8%
Slovenia (2005-2010)	-0.5%
Spain (2005-2010)	0.0%
Sweden (2008-2011)	1.4%
UK	-
EU (Estimated)	-0.1%
Non-EU	
Canada	
China	
Norway (2003-2007)	-0.5%
Switzerland	
US	

Source : London Economics based on Eurostat's supply, use and input-output tables.
Notes: UK, US, Japan, Canada, China, Cyprus, Luxembourg & Romania are excluded as public sector import consumption is not available; Change in EU import penetration is estimated as a weighted average of changes in countries for which changes were calculated, weighted by value of public sector use in latest available year. This value should be taken as only indicative given the variability of available years across countries.

3. EVALUATION OF DIRECT AND INDIRECT CROSS-BORDER PROCUREMENT FROM THE TED DATABASE

3.1. Definitions

This section briefly describes the methodology used to measure cross-border procurement from contract awards published in the Tenders electronic daily (TED) database.[23]

In this regard, across procurement awards, four possible cases can be distinguished:

1. *Domestic procurement*: where the successful bidder is based within the same country as the contracting authority and is domestically owned.

2. *Direct cross-border procurement*: where the successful bidder is not located in the same country as the contracting authority and is not domestically owned

3. *Indirect cross-border procurement*: where the successful bidder is based in the same country as the contracting authority but is a subsidiary of a foreign company

4. *Indirect domestic procurement*: where the successful bidder is not located in the same country as the contracting authority but it is a subsidiary of a domestic company.

The four types of cross-border procurement are presented in Table 10 below.

Table 10: Different forms of domestic and cross-border procurement

Winner / Parent	Domestic owner	Foreign owner
Domestic company	Direct domestic procurement	Indirect cross-border procurement
Foreign company	Indirect domestic procurement	Direct cross-border procurement

Of these four types, as shown by Table 11 below, indirect domestic procurement represents only a very small number of contact awards (just over 0.02% of total). In view of this, domestic direct and domestic indirect procurement are taken as a single category and referred to simply as "domestic procurement". In what follows, the focus is therefore on the distinction between domestic, direct cross-border and indirect cross-border procurement.[24]

Table 11: Number of contract awards per type of procurement, total for 2009-2015[25]

Type	Number of awards
Domestic	
Direct domestic procurement	2,355,347
Indirect domestic procurement	661
Cross-border	
Direct	52,543
Indirect	675,545

Source: London Economics based on TED
Note: Based on contract awards issued in EU28 countries only

23 http://ted.europa.eu.
24 The features of the matching process affect the assignment to indirect domestic cross-border procurement. This is discussed in further detail in section 6.4.
25 Numbers based on the processed contract awards to which our classification methodology was applied.

While direct cross-border awards can be readily identified, it is relatively complex to determine whether indirect cross-border procurement has taken place since the ultimate ownership of the successful bidder has to be determined.

3.2. Methodology for classification of contract awards

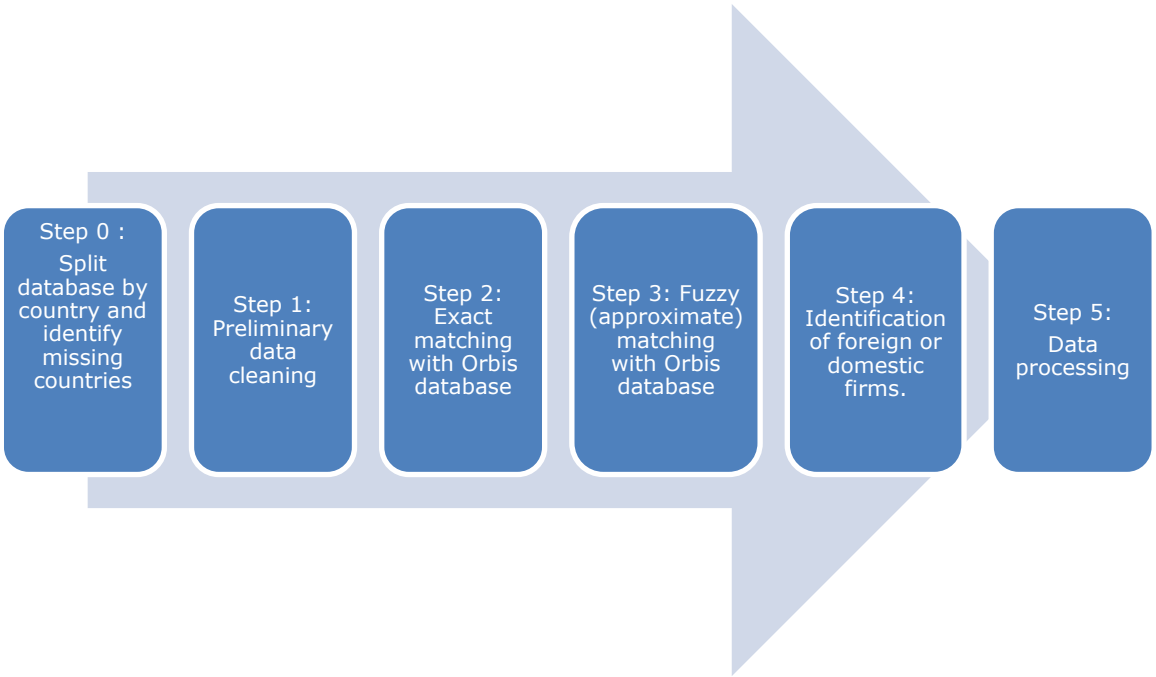
The dataset of contract awards used in this study consisted of the TED transactions from Q1 2009 to Q4 2015.

It is important to note that, in terms of values, there were a significant number of extremely high value contracts, potentially due to errors in recording. Since the focus of the analysis was on the structure of public procurement, more so than on its level, the analysis has been restricted to contracts with award value between €1,000 and €200,000,000. Contracts with missing values have been excluded from "total value" but not from "total number of contracts". Thus, it is important to be particularly cautious when interpreting outcomes related to "value" of contracts. In particular, the total number of awards and value cannot be directly compared to give the average value per award.

In order to identify the corporate linkages of firms participating in cross-border procurement, the successful bidders in these contracts were matched with firm-level records from the Orbis database provided by Bureau Van Dijk (BvD).

To match the successful bidders in the TED contract awards with the firms in the Orbis database and process the matched contract awards, a 6-STEP process was implemented.

Figure 2: Summary of the steps involved in classification of contract awards



Firstly, to match the firms in TED with those in Orbis four steps were required (STEPS 0 – 3).

In Step 0, contract awards were split by the country of successful bidder. There were around 400,000 contract awards where the successful bidder had no country information. We attempted to assign a country to these successful bidders using postcode, telephone & fax numbers, firm name, town and website. Around half of these contract awards were successfully assigned a country.

In Step 1, contract awards were then cleaned by country of successful bidder. For instance, all spaces, symbols and punctuation were removed from firm names. Within each country, we attempted to match successful bidders within the TED database, using email, phone, firm name and postcode details, in order to identify all the unique firms.

In Step 2, firms from the TED database were matched exactly with firms from the Orbis database. In order to improve the exact match, consortium entries were split and the first member of each consortium was also matched exactly with the Orbis database.

In Step 3, firm names from the TED database were "fuzzily" matched with firm names in the Orbis database. In other words, wherever possible, each firm from TED was matched with the firm from Orbis whose name was most similar. As not all firm names from TED were sufficiently similar to a firm name in Orbis, not all firms could be matched.

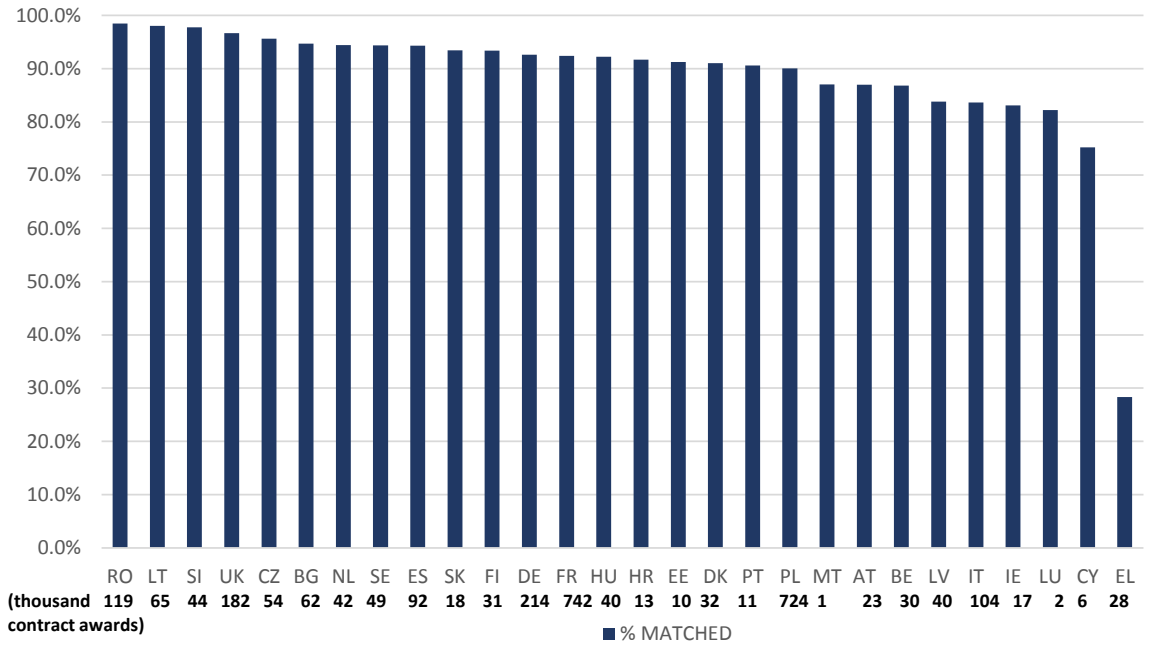
At the end of this process, a quite successful matching rate was achieved, although the match rates of firms across different countries and the success of the different matching techniques varied across countries.

The number of unique successful bidders differs by Member State. It is therefore interesting to consider, not only the match rate of firms at the Member State level, but also the match rate of contract awards.

The match rate of firms, above, translates into a **high match rate of contract awards in the majority of Member States.** Indeed, the match rate of contract awards was over 85% in 22 out of the 28 EU Member States. Only two countries have match rates of contract awards below 80%: Cyprus and Greece.

While Cyprus has an overall contract award match rate of 75%, the match rate is reasonably high for companies recorded in Latin characters but remains low for those recorded in non-Latin characters. Greece has an even lower match rate at just 28%: this is due partly to the issues associated with non-Latin characters but is also due to the fact that the Orbis database contains a relatively small proportion of Greek firms (Please see section 6.4 for a more in-depth discussion).

Figure 3: Final match rates of contract awards per country of successful bidder



Source: London Economics based on TED transactions and Orbis database.
Note: Thousand of contract awards refers to the total number of contract awards in the TED database for the respective country.

Once firms were matched, a further 7 stages were required to identify whether a firm was domestic or foreign (STEP 4). This involved using global ultimate owner (GUO), highest controlling shareholder (CSH), independence indicator[26], shareholder, highest historical

26 Indicator provided by the Orbis database which indicates whether a firm has an owner.

shareholder, standardised legal form and the nationality of the board of directors. Any firms where ownership could not be identified across these 7 stages were allocated as domestic under the assumption that if insufficient ownership information was available on all of the above then the firm was likely to be domestic.

Finally, the matched data was processed to remove any atypical features which could impact results (STEP 5). For instance, very high or low contract awards were removed from the results.

A more detailed overview of the methodology for classification of contract awards and a full discussion of the potential sources of bias can be found in sections 6.3 and 6.4 in the annex.

3.3. High-level summary of cross-border procurement

Between 2009 and 2015, the average level of direct cross-border procurement in the share of contract awards issued by EU28 countries was 1.7% while the average level of indirect cross-border procurement was considerably higher at 21.9% of all contract awards.[27]

Table 12: Direct and indirect cross-border shares of the value and number of awards, yearly total

Year	Total number of awards	Direct cross-border share of number awards	Indirect cross-border share of number of awards	Value of awards (EUR million)	Direct cross-border share in the value of awards	Indirect cross-border share in the value of awards
2009	360,361	1.5%	19.9%	138,927	2.5%	18.6%
2010	404,839	1.5%	21.5%	138,042	2.5%	21.1%
2011	442,243	1.5%	21.4%	148,005	2.8%	19.8%
2012	462,532	1.5%	22.3%	144,989	2.7%	20.0%
2013	453,120	1.9%	22.1%	145,526	3.3%	20.3%
2014	477,867	1.9%	23.0%	142,825	3.4%	21.7%
2015	483,134	2.0%	22.6%	148,053	3.5%	21.4%
Overall	3,084,096	1.7%	21.9%	1,006,367	3.0%	20.4%

Source: London Economics based on TED transactions and Orbis database.

Since 2009, **levels of direct cross-border** procurement in terms of all contract awards have **generally been increasing** both as a share of total value and as a share of the total number of contract awards. This trend reflects a substantial increase in direct cross-border procurement between 2012 and 2013 accompanied by only small changes in all other years.

Over the same period, the **indirect cross-border share** of both number and value of contracts awarded also **followed an overall increasing trend**: the share of total number rose from 19.9% to 22.6% while the share of the total value increased from 18.6% to 21.4%. It can be noted however that this trend of growth of the indirect cross-border share has not been stable over time.

COMPARISON OF RESULTS WITH THE RAMBOLL STUDY

The extent of direct and indirect cross-border procurement was previously estimated by Ramboll in 2011.

The only year of overlap between the studies is 2009.

27 Although we refer to EU28 throughout this chapter, Croatia, as an awarding authority, is only included from 2013 onwards. Firms from Croatia can, however, be present before 2013 as winning bidders or as ultimate owners of winning bidders.

Over that year, the share of direct cross-border awards in the number of awards is found to be the similar across both studies with a 0.1% difference in the cross-border share measured. (1.4% in Ramboll; 1.5% in the current report)

The direct cross-border share in the value of awards is higher in the Ramboll study at 3.6% relative to 2.5%. As the direct cross-border share in the value of awards is more likely to be impacted by extreme values, this is not a significant concern as it is likely to be down to sampling differences between the two studies.

The overall similarity between the results for direct cross-border shares is reassuring.[28]

Table 13: Comparison of 2009 direct and indirect cross-border shares with the Ramboll study

	Direct cross-border share in the number of awards	Indirect cross-border share in the number of awards	Direct cross-border share in the value of awards	Indirect cross-border share in the value of awards
Ramboll Study	1.4%	11.4%	3.6%	12.4%
Current report	1.5%	19.9%	2.5%	18.6%

Source: Ramboll (2011) and London Economics based on TED transactions and Orbis database.
Note: EU27 since Croatia is only included from 2013 onwards.

However, there was a much bigger difference between the indirect cross-border shares in both the number and the value of awards: 11.4% in Ramboll to 19.9% in the current report and 12.4% in Ramboll to 18.6% in the present report, respectively.

It is important to note that there are a few key differences between the sampling methodology of the Ramboll (2011) study and that of the current study. Namely, rather than attempting to match all contract awards, the 2011 Ramboll study analysed the penetration of cross-border procurement using a stratified sample of the overall data. Ramboll then matched a re-weighted sample of TED contracts to correct for sampling bias. The present study attempts to match all contracts in the TED database.

In addition, the period covered by the two studies overlaps in only one year.

Last but not least, the Ramboll study identified indirect cross-border contracts through the global ultimate owner (GUO) only whereas this study identified indirect cross-border contracts through GUO information in combination with wider company information. In the matching process, while the Ramboll study uses the D&B database to identify the ownership structure of successful bidders, the present study uses ownership and independence indicators from the Orbis database.[29]

A further discussion for reasons why the results between the two studies may differ is included in the annex 6.5.

3.4. Country-level

This section analyses the shares of direct and indirect cross-border procurement at the country level across both EU28 and key trading partners.[30]

It is split into eight sub-sections:

- Level and structure of cross-border procurement, by country of contracting authority;
- Evolution of cross-border procurement, by country of contracting authority;

28 Contract awards are determined to be direct on the basis of location of contracting authority and location of successful bidder which is given in TED. In turn, the only differences arising across the studies should be the sample of contract awards considered. These depend for example on the cut-off level for removing 'extreme' award values.
29 For instance, shareholder information was also used to determine ownership. Please see annex 6.3.7 for further information on how firm ownership was determined.
30 Canada, China, Norway, Switzerland, the US and Japan, where data is available.

- Split of cross-border procurement between EU and non-EU firms, by country of contracting authority;
- Bilateral analysis of cross-border procurement: awarding authority perspective;
- Contract winners from selected non-EU Member States, by country of contracting authority;
- Level of cross-border procurement, by NUTS1 and NUTS2 region;
- Level and structure of cross-border procurement, by country of contract winner.
- Bilateral analysis of cross-border procurement: contract winner perspective.

3.4.1. Level and structure of cross-border procurement, by country of contracting authority

Between 2009 and 2015, the average share of direct cross-border procurement in the total number of awards was 1.7%.

As shown by Table 14, at the country level direct cross-border procurement as a share of the number of awards varied between 0.7% and 16.8% across EU28 countries. Similarly, the average share of the direct cross-border contracts in the value of awards varied from 1.2% to 19.6%.

As the direct cross-border share in the value of contract awards is higher than the direct cross-border share in the number of awards for most Member States, this suggests that the average value of cross-border contracts was greater than the average value of domestic contracts.[31]

Table 14: Number and value of direct and indirect cross-border awards, 2009-2015, EU28 and key trading partners

Country	Total number of awards	Direct cross-border share of the number of awards	Indirect cross-border share of the number of awards	Total value (EUR million)	Direct cross-border share of value of awards	Indirect cross-border share of value of awards
Austria	22,488	6.1%	19.0%	15,172	5.2%	19.8%
Belgium	39,888	5.7%	32.1%	21,874	5.1%	36.1%
Bulgaria	61,887	0.7%	11.4%	14,219	4.5%	15.4%
Croatia	14,499	1.1%	17.3%	5,102	4.7%	17.4%
Cyprus	6,502	6.4%	3.8%	2,503	13.8%	5.9%
Czech R.	56,866	2.5%	21.1%	31,665	3.0%	30.2%
Denmark	33,239	5.3%	22.8%	19,283	4.8%	16.7%
Estonia	13,358	5.8%	22.0%	8,282	7.4%	22.3%
Finland	31,918	3.0%	19.5%	17,507	2.9%	24.0%
France	821,626	1.3%	17.6%	184,360	1.8%	12.2%
Germany	219,566	1.6%	15.5%	77,711	2.1%	16.0%
Greece	27,648	1.2%	15.4%	12,233	3.4%	11.5%
Hungary	40,793	1.9%	17.1%	24,071	3.6%	22.5%
Ireland	18,951	13.0%	21.3%	4,294	10.0%	20.8%

31 This inference should be considered with care since cross-border contract values may be impacted by bias. As outlined in annex 6.3, high value awards are excluded to prevent extreme values from biasing results. However, this is unlikely to have removed all potential sources of biases. In particular, one concern for cross-border contracts is that they may have been entered in the incorrect currency which could partly explain the differential between the cross-border shares in the number and value of awards. However, this cannot be verified.

Country	Total number of awards	Direct cross-border share of the number of awards	Indirect cross-border share of the number of awards	Total value (EUR million)	Direct cross-border share of value of awards	Indirect cross-border share of value of awards
Italy	116,217	2.4%	31.7%	100,569	2.6%	24.2%
Latvia	70,616	2.3%	28.8%	32,874	3.2%	16.0%
Lithuania	67,009	1.4%	34.3%	9,171	7.1%	20.9%
Luxembourg	2,719	16.8%	23.8%	2,031	13.3%	18.7%
Malta	1,775	11.9%	2.1%	1,030	19.6%	6.0%
Netherlands	43,508	2.6%	18.3%	17,837	2.8%	17.5%
Poland	789,644	0.9%	23.7%	132,644	1.9%	23.2%
Portugal	11,728	3.9%	31.6%	7,891	6.8%	25.9%
Romania	135,831	1.1%	34.8%	40,089	7.1%	24.0%
Slovakia	19,571	4.3%	19.3%	16,313	6.4%	24.4%
Slovenia	44,984	1.8%	15.3%	8,368	7.8%	17.4%
Spain	99,745	1.5%	30.9%	74,804	1.2%	27.0%
Sweden	58,241	2.4%	22.5%	11,967	3.4%	20.4%
UK	213,279	2.1%	20.0%	112,502	2.5%	22.3%
EU	3,084,096	1.7%	21.9%	1,006,367	3.0%	20.4%
Non-EU						
Switzerland	26,588	7.0%	-	27,049	6.8%	-
Norway	46,460	5.7%	-	34,537	4.9%	-

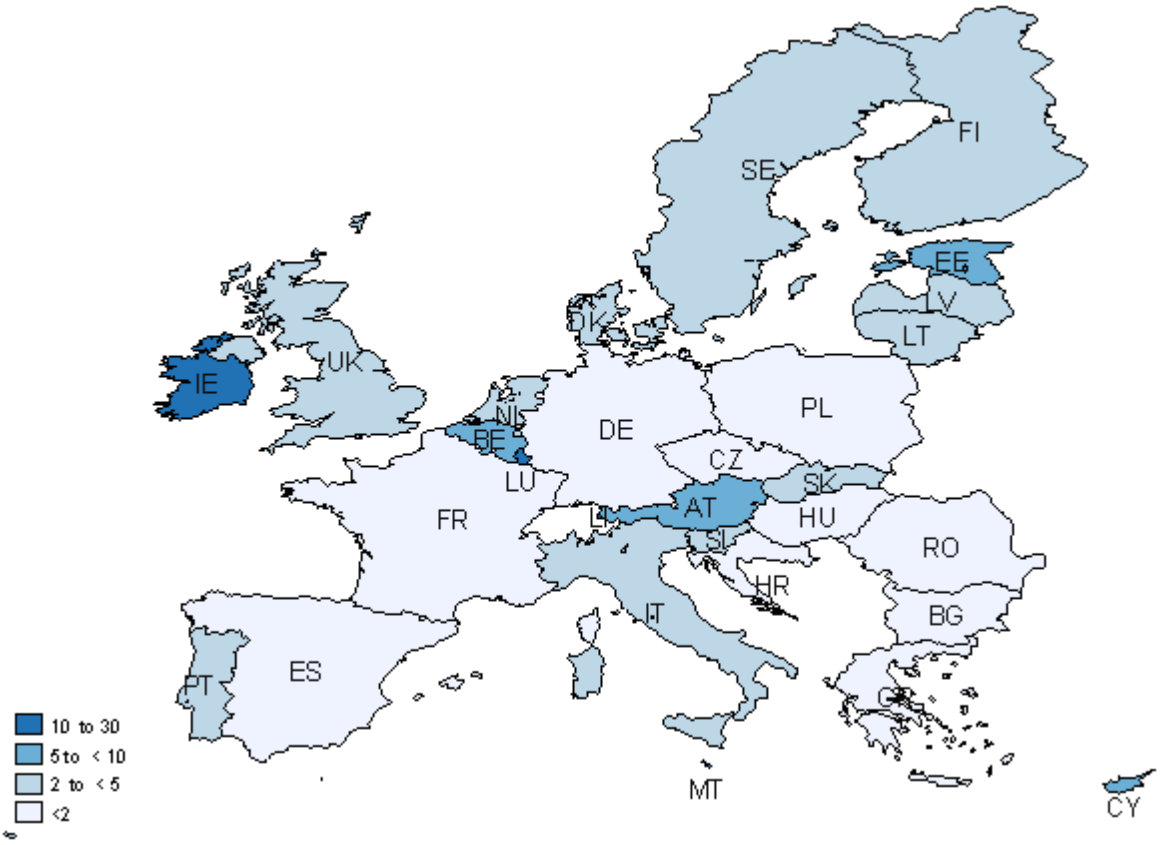
Source: London Economics based on TED transactions and Orbis database.
Note: EU 'Total number of awards' and 'Total value' figures are based on a simple sum of the respective numbers for all EU28 countries. EU direct and indirect share values represent a weighted average of all countries.

The direct cross-border shares of number of awards are above 10% in only three countries: Malta (11.9%), Ireland (13.0%) and Luxembourg (16.8%). These high levels of direct cross-border procurement may be explained by the fact that:

- These are all relatively small countries and as result there may be less competition for contracts from domestically located firms; and
- it is not worth for foreign companies to set up in these countries in order to trade because they are small markets: as a result, foreign companies may be more likely to bid for contracts directly cross-border.

Despite this variability, the direct cross-border share in the number of awards remained under 5% in the majority of EU28 Member States.

Figure 4: Direct cross-border share of the number of awards between 2009 and 2015, EU28



Source: London Economics based on TED transactions and Orbis database.

As to indirect cross-border procurement, the average share of the total number of awards was considerably higher than direct cross-border procurement at 21.9%.

The range of indirect cross-border procurement as a share of the number of awards varied between 2.1% and 34.8% across EU28 countries as shown by the figure below with indirect cross-border procurement above 15% in most[32] Member States.

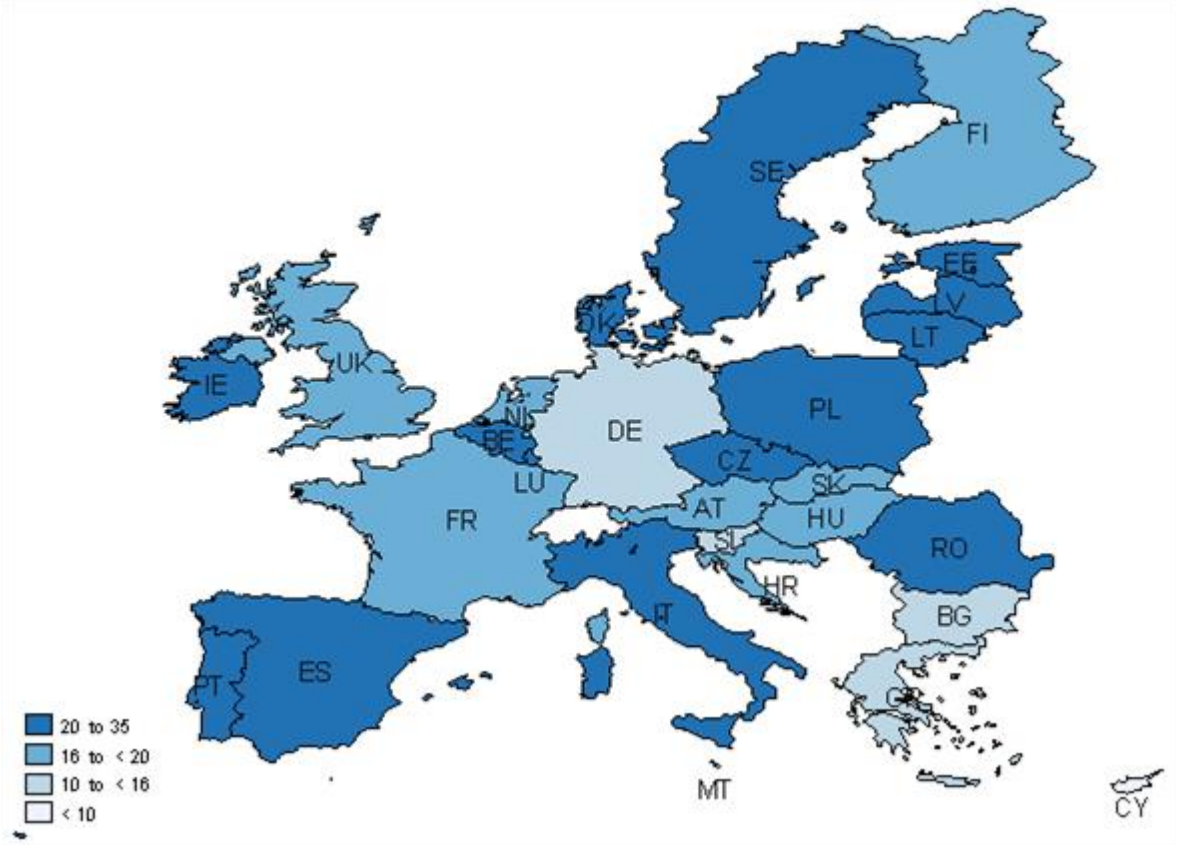
The only countries where the share of indirect cross-border procurement was below 10% were Malta (2.1%) & Cyprus (3.8%).

One potential explanation for this is that it is not worthwhile for firms to establish subsidiaries in Malta or Cyprus because they are both very small markets. Indeed, although the level of indirect cross-border procurement is estimated to be low in Malta and Cyprus, the direct share of cross-border procurement is relatively high in both Cyprus (6.4%) and Malta (11.9%).

A further explanation for why the indirect share is low for Cyprus may be associated with the issues faced in matching Cyrillic characters during the matching. For further detail on this bias, see section 6.4 in the annex.

32 25 out of 28 Member States.

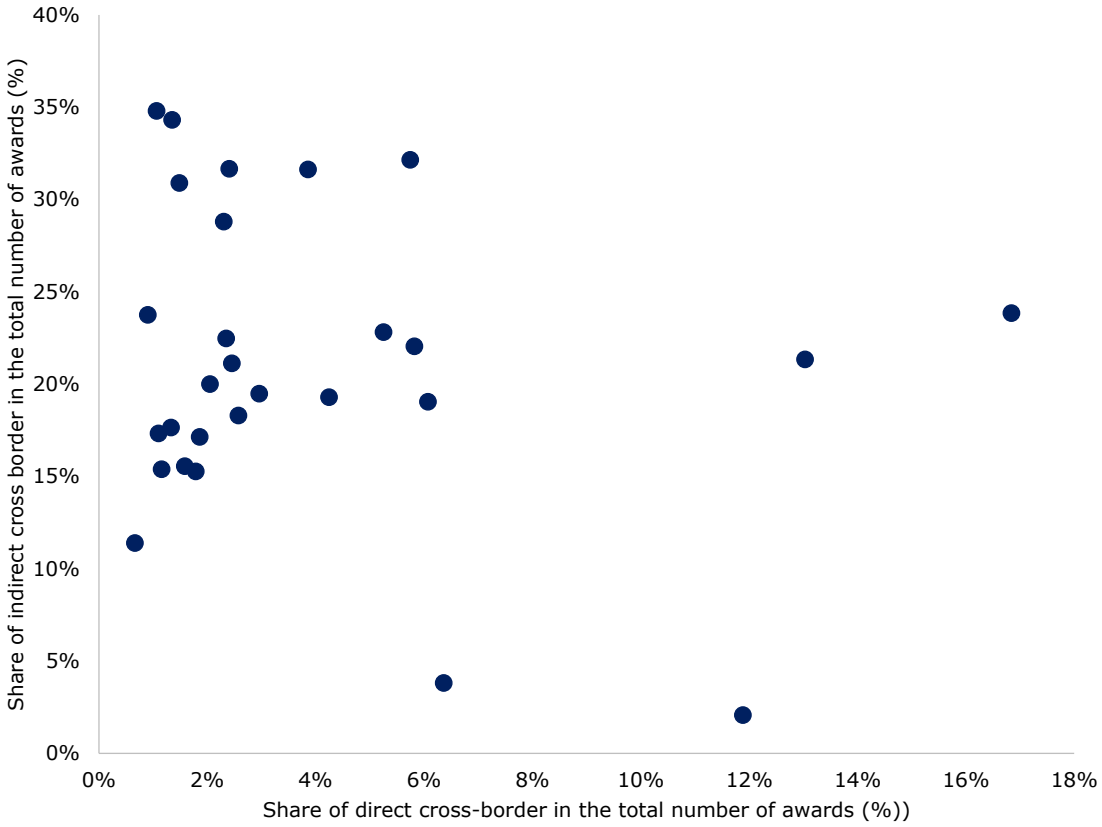
Figure 5: Indirect cross-border share of the number of awards between 2009 and 2015, EU28



Source: London Economics based on TED transactions and Orbis database.

It is interesting to note that there appears to be no clear relationship between shares of indirect and direct cross-border procurement shares at the country level.

Figure 6: Relationship between the share of indirect cross-border in total number of awards and the share of direct cross-border in the total number of awards, EU28

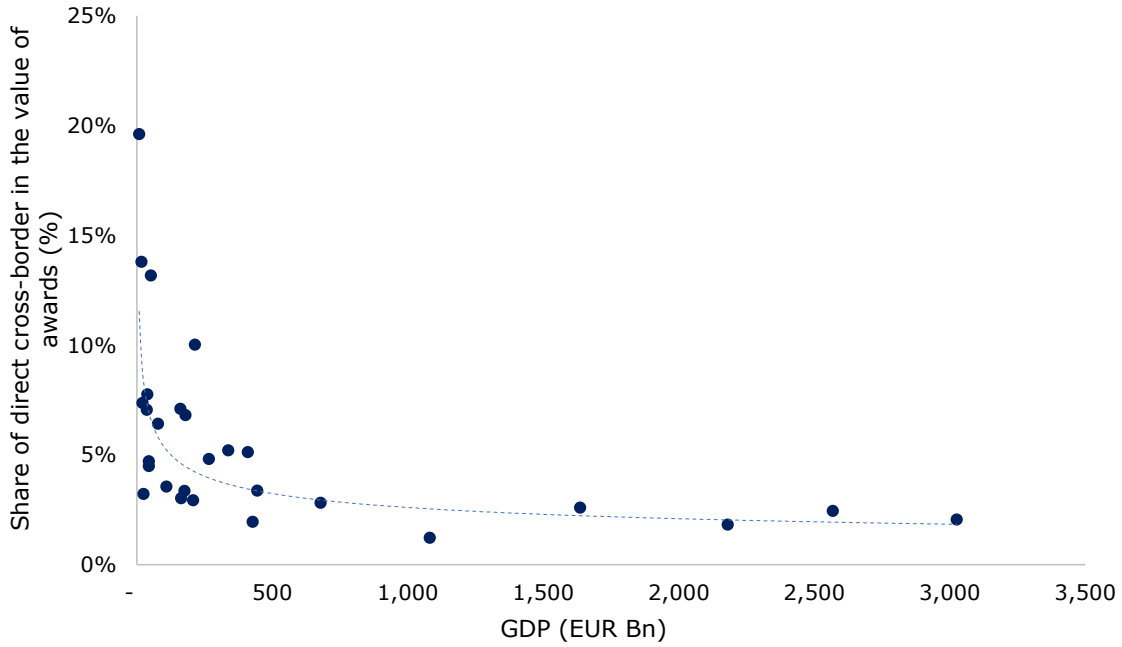


Source: London Economics based on TED transactions and Orbis database.
Note: Cross border shares are over the period 2009-2015.

However, Figure 7 and Figure 8 overleaf demonstrate that there is a weak negative relationship between both GDP & population and the share of direct cross-border contracts in the value of awards and in the total number of awards: **smaller countries are generally more likely to award contracts to firms located in other countries**.

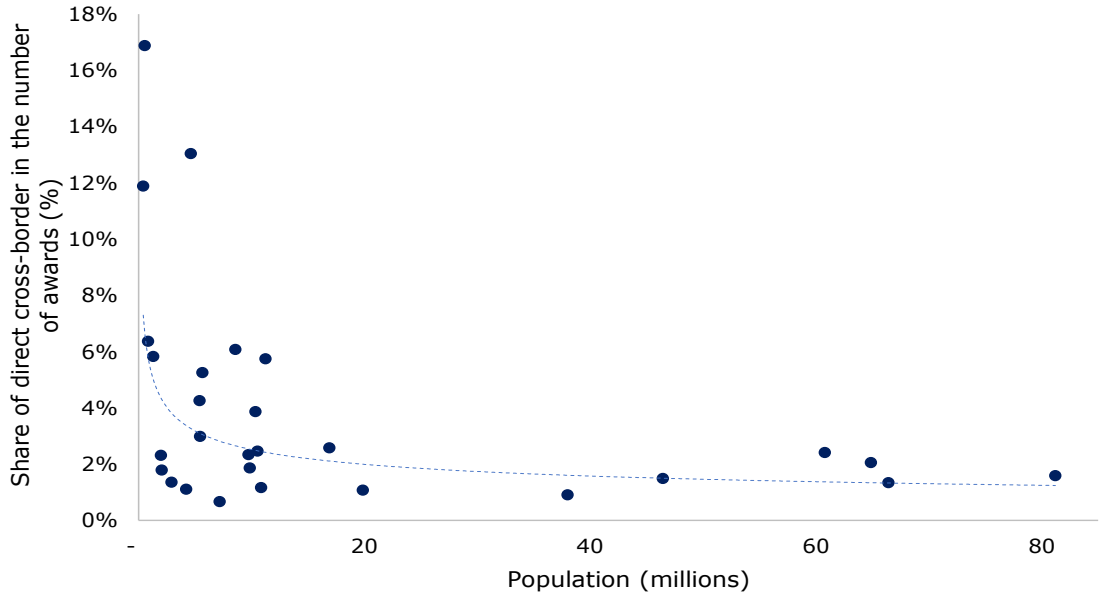
This is unsurprising given that the gains from importing are likely to be higher for smaller countries as shown by the macroeconomic data in section 2.

Figure 7: Relationship between the share of direct cross-border in total value of awards and GDP, EU28



Source: London Economics based on TED transactions and Orbis database; GDP data from Eurostat.
Note: Cross border shares are over the period 2009-2015; GDP data is latest available.

Figure 8: Relationship between the share of direct cross-border in total number of awards and population size, EU28

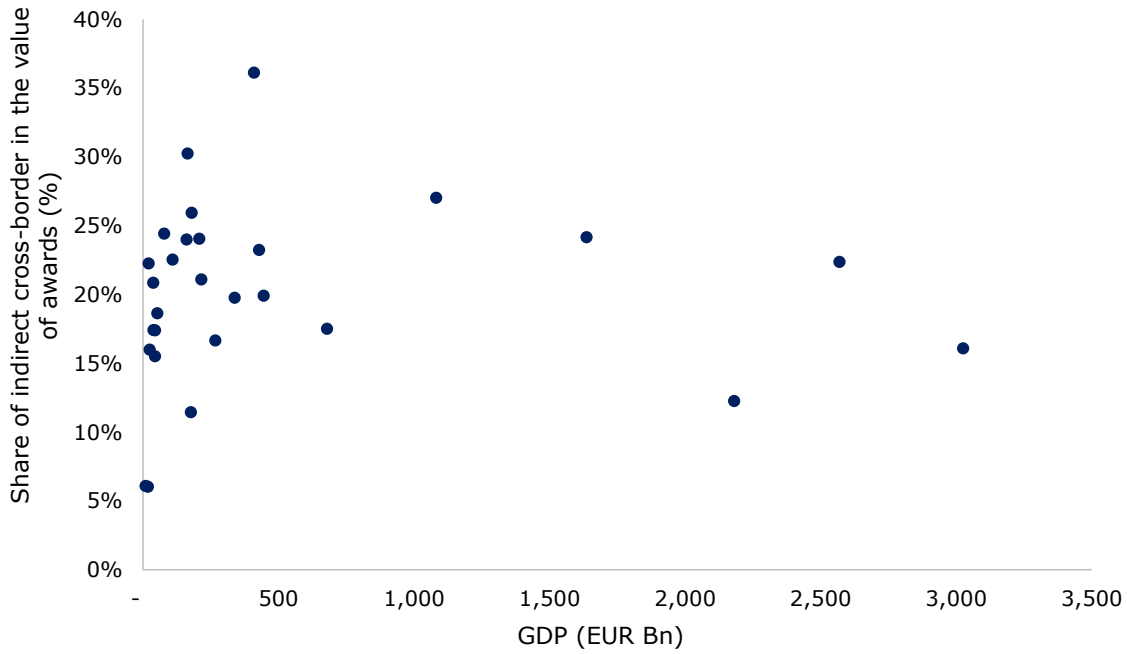


Source: London Economics based on TED transactions and Orbis database; population data from Eurostat.
Note: Cross border shares are over the period 2009-2015; population data is latest available.

As to indirect cross-border, Figure 9 and Figure 10 provide no evidence for a relationship between either GDP or population and shares of indirect cross-border procurements.

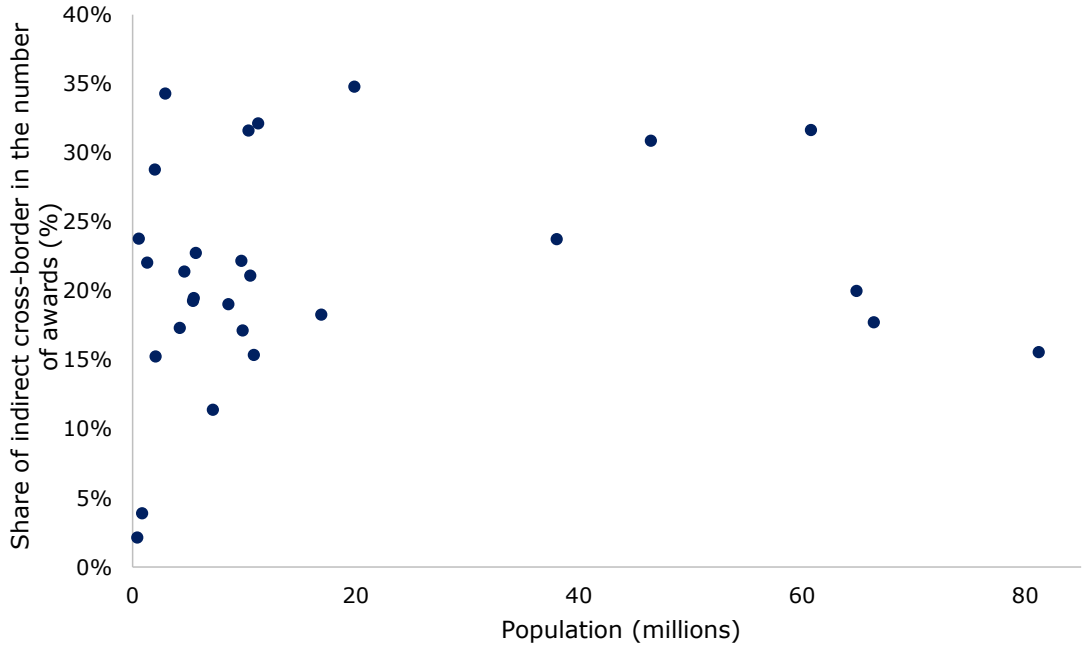
Please see annex 6.7 for data tables comparing cross-border shares with GDP and population.

Figure 9: Relationship between the share of indirect cross-border in total value of awards and GDP, EU28



Source: London Economics based on TED transactions and Orbis database; GDP data from Eurostat.
Note: Cross border shares are over the period 2009-2015; GDP data is latest available.

Figure 10: Relationship between the share of indirect cross-border in total number of awards and population size, EU28



Source: London Economics based on TED transactions and Orbis database; population data from Eurostat.
Note: Cross border shares are over the period 2009-2015; population data is latest available.

3.4.2. Evolution of cross-border procurement, by country of contracting authority

Although at the EU level the share of direct cross-border procurement increased between 2009 and 2015, this was not the case for almost half of all EU countries.

As such, the general increasing trend in the share of direct cross-border procurement in both the value and number of awards hides significant heterogeneity across the EU as a whole. This prompted an investigation of whether any explanatory patterns could be discerned.

Between 2012 and 2013, the year in which there is a substantial increase in the share of direct cross-border procurement in the number of awards at the EU28 level, 19 out of 28 EU countries experience increases in shares indicating that this large change was due to many EU countries experiencing increases in cross-border procurement.

Table 15: Direct cross-border shares in the total number of awards between 2009 and 2015, EU28

Country	2009	2010	2011	2012	2013	2014	2015
Austria	5.8%	5.6%	6.8%	5.6%	7.4%	6.4%	5.0%
Belgium	6.1%	6.6%	5.8%	5.4%	5.0%	5.3%	6.3%
Bulgaria	1.4%	0.5%	0.6%	0.6%	0.5%	0.7%	0.8%
Croatia					3.2%	1.2%	1.0%
Cyprus	9.4%	5.5%	7.3%	5.3%	5.8%	5.3%	6.4%
Czech R.	1.1%	1.6%	1.9%	2.3%	2.1%	5.3%	2.0%
Denmark	4.9%	5.5%	4.7%	4.2%	4.6%	6.2%	6.7%
Estonia	7.2%	5.1%	7.0%	4.7%	7.3%	5.9%	5.1%
Finland	2.1%	1.6%	2.5%	3.0%	4.0%	3.4%	4.7%
France	0.9%	0.9%	0.7%	0.9%	2.0%	1.9%	2.2%
Germany	1.5%	1.5%	1.7%	1.5%	1.6%	1.6%	1.7%
Greece	2.1%	1.5%	1.1%	0.9%	1.5%	0.7%	0.9%
Hungary	1.1%	1.9%	1.6%	1.8%	2.0%	2.2%	2.4%
Ireland	13.5%	12.0%	11.6%	14.4%	17.1%	11.2%	12.8%
Italy	1.3%	2.4%	3.4%	2.1%	2.9%	2.6%	2.1%
Latvia	1.4%	1.8%	2.1%	2.2%	1.8%	3.0%	3.3%
Lithuania	2.3%	1.5%	1.4%	0.9%	2.3%	0.8%	1.8%
Luxembourg	14.7%	17.7%	18.5%	12.9%	18.2%	17.1%	18.3%
Malta	18.2%	15.6%	18.7%	12.6%	14.3%	9.6%	6.8%
Netherlands	3.6%	2.4%	1.9%	2.8%	2.3%	3.3%	2.0%
Poland	0.8%	0.8%	0.7%	0.8%	0.9%	1.0%	1.3%
Portugal	2.7%	4.0%	4.2%	3.3%	3.4%	5.0%	4.0%
Romania	1.9%	2.1%	1.6%	0.8%	0.7%	0.7%	0.6%
Slovakia	4.4%	4.4%	5.4%	3.3%	2.3%	5.0%	7.6%
Slovenia	1.4%	1.9%	2.0%	1.1%	1.7%	2.1%	2.4%
Spain	1.0%	1.2%	1.6%	2.0%	1.8%	1.5%	1.6%
Sweden	3.5%	2.9%	2.4%	2.5%	1.9%	2.1%	1.8%
UK	1.7%	1.6%	2.1%	1.9%	2.4%	2.5%	2.1%
EU28	1.5%	1.5%	1.5%	1.5%	1.9%	1.9%	2.0%
Non-EU							
Switzerland	11.8%	6.6%	6.8%	7.7%	6.2%	7.1%	6.3%
Norway	4.9%	4.8%	5.7%	6.4%	5.7%	6.6%	5.9%

Source: London Economics based on TED transactions and Orbis database.
Note: Stronger green indicates larger share relative to the average for that country.

Table 16: Direct cross-border shares in the total value of awards between 2009 and 2015, EU28

Country	2009	2010	2011	2012	2013	2014	2015
Austria	5.1%	7.1%	5.1%	4.4%	4.7%	4.2%	5.2%
Belgium	5.2%	4.7%	5.1%	5.2%	3.6%	4.5%	5.9%
Bulgaria	7.3%	2.3%	4.9%	1.9%	3.0%	2.2%	3.1%
Cyprus	23.7%	9.0%	10.6%	5.4%	18.8%	12.7%	12.2%
Czech R.	1.7%	3.0%	3.2%	3.7%	2.7%	3.0%	3.5%
Germany	1.4%	1.3%	1.6%	1.4%	2.4%	1.6%	2.0%
Denmark	5.7%	2.7%	5.0%	5.1%	2.7%	5.3%	8.9%

Country	2009	2010	2011	2012	2013	2014	2015
Estonia	7.1%	7.6%	12.8%	4.5%	6.5%	4.6%	8.4%
Spain	0.8%	1.2%	1.9%	1.3%	1.2%	1.9%	1.0%
Finland	1.3%	2.0%	3.1%	2.2%	2.8%	3.2%	3.1%
France	1.5%	1.7%	1.5%	3.9%	3.2%	4.0%	3.1%
Greece	7.4%	4.8%	3.6%	2.6%	1.5%	2.4%	1.3%
Croatia					5.0%	4.6%	2.2%
Hungary	3.1%	2.7%	3.3%	3.2%	3.1%	3.1%	4.7%
Ireland	7.4%	16.3%	3.8%	21.5%	5.6%	4.5%	12.7%
Italy	1.1%	2.0%	3.6%	3.1%	3.0%	3.3%	2.4%
Lithuania	5.8%	3.0%	3.5%	1.7%	7.0%	5.0%	4.6%
Luxembourg	7.0%	20.8%	14.7%	11.7%	12.5%	19.3%	19.1%
Latvia	1.1%	3.2%	1.1%	2.5%	3.3%	4.5%	3.4%
Malta	46.4%	24.3%	25.4%	13.2%	24.6%	16.9%	13.6%
Netherlands	2.7%	3.3%	2.1%	2.1%	3.3%	1.6%	3.0%
Poland	1.5%	1.1%	1.0%	1.1%	1.7%	1.4%	1.8%
Portugal	6.2%	5.5%	3.2%	2.9%	9.5%	9.1%	9.3%
Romania	7.1%	7.1%	5.0%	2.9%	4.4%	2.5%	1.4%
Sweden	3.1%	3.2%	1.7%	2.8%	3.1%	2.6%	1.6%
Slovenia	2.5%	3.2%	4.0%	4.3%	6.3%	12.7%	9.1%
Slovakia	7.4%	5.5%	7.6%	5.3%	3.5%	7.6%	8.7%
UK	1.0%	1.0%	1.6%	2.1%	2.7%	1.8%	2.6%
EU28	2.1%	2.2%	2.4%	2.9%	2.9%	2.9%	3.0%
Non-EU							
Switzerland	8.7%	6.2%	6.7%	8.1%	9.5%	6.9%	4.8%
Norway	3.7%	3.8%	5.6%	5.0%	2.9%	8.9%	4.4%

Source: London Economics based on TED transactions and Orbis database.
Note: Stronger green indicates larger share relative to the average for that country.

It is possible that the negative economic conditions had a generally dampening effect on cross-border purchasing. Several countries had their higher levels at the start of the period, including Cyprus, Estonia, Greece, Malta and Sweden. In some countries, this may be due to development of the local economies and domestic producers widening the range of what they are able to supply.

As to indirect cross-border procurement which is given in Table 17 below, over 70% of countries experienced an increase in share of indirect cross-border procurement in the number of awards between 2009 and 2015. However, there was also no consistent pattern over time or across countries for how individual countries performed.

Countries that saw a decrease in indirect cross-border procurement shares over the period include Ireland, Slovenia and Slovakia (between 4 and 6 percentage points drop in share) and, to a smaller extent, Estonia, Lithuania, Denmark, France and the United Kingdom.

In Ireland, Slovenia, Slovakia, Estonia and Lithuania, this could reflect improving performance of domestically owned companies relative to foreign owned ones.[33] It is more difficult to discern an explanation for the slight downward trend in Denmark, France and the UK. However, it is interesting to observe that these countries have meanwhile experienced an increase in the share of direct cross-border procurement over the same period, indicating at a potential substitution effect from indirect to direct cross-border procurement in these countries.

33 Eurostat (2015). 'National Accounts and GDP', Table 2. Available at: http://ec.europa.eu/eurostat/statistics-explained/index.php/National_accounts_and_GDP.

Table 17: Indirect cross-border shares in the total number of contracts awarded between 2009 and 2015, EU28

Country	2009	2010	2011	2012	2013	2014	2015
Austria	15.2%	18.8%	18.4%	17.6%	22.0%	18.8%	22.3%
Belgium	30.7%	31.5%	33.2%	31.2%	30.3%	35.4%	32.2%
Bulgaria	8.3%	6.6%	8.8%	14.1%	13.6%	9.7%	14.6%
Croatia					19.5%	15.2%	18.4%
Cyprus	1.9%	2.3%	3.9%	6.8%	4.4%	3.8%	2.4%
Czech R.	18.9%	18.7%	22.1%	24.2%	22.5%	20.1%	20.9%
Denmark	23.4%	21.8%	26.5%	24.0%	21.1%	21.6%	21.8%
Estonia	25.0%	13.5%	23.0%	20.7%	25.7%	24.4%	21.8%
Finland	18.9%	18.1%	20.7%	18.4%	20.2%	18.4%	22.1%
France	17.7%	18.0%	17.6%	17.8%	17.7%	18.3%	16.3%
Germany	12.4%	16.9%	13.8%	15.5%	16.1%	17.1%	15.8%
Greece	14.1%	16.7%	17.1%	15.8%	14.0%	15.3%	14.8%
Hungary	13.3%	16.0%	17.7%	13.9%	18.1%	17.6%	22.7%
Ireland	22.9%	21.6%	22.2%	21.3%	21.3%	20.1%	19.0%
Italy	29.4%	30.0%	30.7%	31.6%	31.0%	34.2%	34.1%
Latvia	17.0%	33.7%	27.7%	22.1%	31.8%	28.0%	32.6%
Lithuania	24.1%	37.3%	32.0%	45.0%	19.1%	39.3%	23.3%
Luxembourg	22.6%	22.9%	23.3%	30.4%	23.5%	21.3%	24.2%
Malta	0.0%	1.9%	1.9%	2.9%	4.5%	1.1%	2.1%
Netherlands	16.2%	17.4%	18.6%	18.5%	18.9%	20.4%	17.4%
Poland	21.5%	22.9%	22.0%	22.8%	24.7%	24.6%	26.6%
Portugal	29.2%	26.2%	30.9%	28.3%	34.0%	34.5%	35.1%
Romania	27.0%	33.1%	37.2%	37.9%	36.1%	34.0%	34.4%
Slovakia	25.3%	22.7%	21.8%	17.4%	15.8%	21.1%	19.7%
Slovenia	16.0%	16.5%	15.0%	15.9%	16.9%	15.8%	11.0%
Spain	27.6%	28.3%	31.3%	32.7%	31.9%	32.7%	32.7%
Sweden	21.1%	22.7%	21.7%	21.7%	22.7%	22.1%	24.1%
United Kingdom	20.9%	21.1%	20.5%	19.2%	20.3%	19.4%	19.0%
EU28	19.9%	21.5%	21.4%	22.3%	22.1%	23.0%	22.6%

Source: London Economics based on TED transactions and Orbis database.
Note: Stronger green indicates larger share relative to the average for that country.

Table 18: Indirect cross-border shares in the total value of contracts awarded between 2009 and 2015, EU28

Country	2009	2010	2011	2012	2013	2014	2015
Austria	12.7%	15.3%	16.6%	17.9%	19.6%	22.4%	28.9%
Belgium	35.4%	31.4%	36.5%	36.8%	35.8%	44.2%	42.4%
Bulgaria	14.0%	11.3%	18.5%	51.0%	23.0%	11.8%	15.5%
Cyprus	2.8%	3.1%	9.5%	8.2%	6.3%	5.6%	5.4%
Czech R.	31.5%	27.9%	30.6%	28.9%	30.2%	27.5%	32.0%
Germany	10.6%	16.0%	18.0%	16.7%	17.4%	14.8%	14.3%
Denmark	32.2%	28.7%	32.2%	26.7%	28.5%	32.2%	30.1%
Estonia	17.5%	12.3%	26.1%	23.9%	25.5%	27.7%	19.0%
Spain	21.3%	20.8%	25.2%	30.5%	32.7%	29.4%	31.4%
Finland	22.5%	23.0%	21.6%	21.9%	24.7%	19.6%	21.1%
France	11.5%	16.9%	24.8%	17.7%	13.6%	17.2%	17.9%
Greece	14.3%	18.7%	5.8%	18.1%	10.2%	7.8%	7.1%
Croatia					39.6%	16.9%	17.9%
Hungary	22.0%	26.3%	22.1%	11.3%	25.0%	24.1%	21.7%
Ireland	20.8%	20.5%	9.7%	15.6%	14.6%	19.7%	23.2%
Italy	26.1%	24.9%	28.4%	25.5%	22.8%	29.9%	30.4%
Lithuania	24.2%	42.7%	36.9%	54.1%	20.5%	20.2%	20.7%
Luxembourg	25.1%	10.2%	22.0%	29.5%	12.8%	14.7%	16.5%
Latvia	8.6%	31.1%	14.1%	9.2%	16.0%	26.0%	27.6%
Malta	0.0%	13.6%	0.3%	18.7%	1.3%	0.7%	2.5%
Netherlands	14.3%	19.6%	16.7%	15.1%	19.7%	17.8%	21.2%
Poland	19.2%	23.3%	21.0%	20.2%	21.2%	21.8%	23.1%
Portugal	20.2%	24.2%	25.3%	38.9%	24.5%	36.1%	30.3%
Romania	19.4%	28.0%	32.4%	31.8%	34.0%	36.7%	37.7%
Sweden	24.0%	26.6%	20.3%	22.1%	20.8%	21.7%	10.4%
Slovenia	12.1%	10.6%	12.8%	21.7%	16.1%	18.8%	16.5%
Slovakia	23.8%	26.8%	27.4%	28.5%	16.8%	28.6%	26.4%
United Kingdom	20.6%	25.7%	19.5%	19.1%	22.4%	18.4%	20.5%
EU28	18.9%	22.5%	22.9%	22.9%	21.9%	22.6%	23.2%

Source: London Economics based on TED transactions and Orbis database.
Note: Stronger green indicates larger share relative to the average for that country.

3.4.3. Split of cross-border procurement between EU and non-EU firms, by country of contracting authority

This subsection analyses the countries of the owners of the winners of cross-border contract awards issued by EU28 contracting authorities in more detail.

Table 19 below splits **country of ownership for direct cross-border** contracts **between EU and non-EU successful bidders**.

It is evident that the vast majority of direct cross-border contracts – 78.6% of all contracts and 78.7% of the value of contracts between 2009 and 2015 - are awarded to other EU countries.

However, this percentage has generally followed a decreasing trend in terms of both number and value of awards with the share of the number of direct cross-border contracts awarded to firms within the EU decreasing from 87.4% in 2009 to 73.6% in 2015.

This result is not due to the number of direct cross-border contracts to other EU countries falling during this period. In fact, there were nearly double as many direct cross-border contracts to the EU28 in 2015 relative to 2009. Instead, it is due to the number of direct cross-border contracts awarded outside the EU increasing more rapidly.

Table 19: Breakdown of country of winner for direct cross-border awards between EU and non-EU countries, 2009 to 2015

Year	Number of direct cross-border contracts awarded to firms located in the EU28	Number of direct cross-border contracts awarded to firms located outside the EU28	EU share in the total number of direct cross-border awards	Value of direct cross-border contracts awarded to firms located in the EU28 (EUR million)	Value of direct cross-border contracts awarded to firms located outside the EU28 (EUR million)	EU share in the total value of direct cross-border awards
2009	4,743	685	87.4%	2,944	545	84.4%
2010	5,436	773	87.6%	2,964	506	85.4%
2011	5,696	1,155	83.1%	3,514	577	85.9%
2012	5,601	1,256	81.7%	3,139	827	79.1%
2013	6,030	2,431	71.3%	3,564	1,174	75.2%
2014	6,694	2,436	73.3%	3,565	1,345	72.6%
2015	7,074	2,533	73.6%	3,779	1,381	73.2%
Total	41,274	11,269	78.6%	23,469	6,356	78.7%

Source: London Economics based on TED transactions and Orbis database.

The top 3 non-EU countries who won the largest number of contracts from contracting authorities located in the EU are the US, Switzerland and Norway. The non-EU countries which won the highest value of EU contracts are the US, Switzerland and Canada.

As Switzerland and Norway are both part of the EFTA and are geographically well-positioned to trade with the EU, it is hardly surprising that they are among the largest non-EU winners of direct cross-border contracts both in terms of number and value of awards. Neither is it surprising that the US wins a relatively large proportion of EU contract awards as it is the world's largest economy.

Table 20: Top 3 non-EU countries for successful bidders for direct cross-border awards, 2009 to 2015

Top 3 non-EU countries partners	
In terms of contract numbers	In terms of contract values
US	US
Switzerland	Switzerland
Norway	Canada

Source: London Economics based on TED transactions and Orbis database.

The Table below splits **country of ownership for indirect cross-border** contracts **between EU versus non-EU successful bidders** where the country of ownership could be exactly identified.[34]

34 It should be noted that the exact country of ownership was not identified for around 5% of indirect cross-border contracts. For instance, if a firm had several owners located in different foreign countries then the firm could be identified as foreign. However, it

For indirect cross-border shares, it is estimated that 61.3% of the number of contracts and 68.0% of the value of contracts were won by EU based firms.

Unlike the EU direct cross-border share, this percentage of indirect cross-border in terms of both number and value of awards actually increased between 2009 and 2015.

This reflects the fact that between 2009 and 2015 the number of indirect cross-border contract awards directed towards EU firms increased more rapidly than the number of indirect cross-border contracts directed to firms outside the EU.

Table 21: Breakdown of country of winner for indirect cross-border awards between EU and non-EU countries, 2009 to 2015

Year	Number of indirect cross-border contracts awarded to firms located in the EU28	Number of indirect cross-border contracts awarded to firms located outside the EU28	EU share in the total number of indirect cross-border awards	Value of indirect cross-border contracts awarded to firms located in the EU28 (EUR million)	Value of indirect cross-border contracts awarded to firms located outside the EU28 (EUR million)	EU share in the total value of indirect cross-border awards
2009	37,232	23,895	60.9%	14,942	7,354	67.0%
2010	45,491	29,367	60.8%	17,595	7,758	69.4%
2011	49,636	32,249	60.6%	17,402	7,624	69.5%
2012	54,103	35,353	60.5%	17,273	7,939	68.5%
2013	53,724	33,207	61.8%	17,490	8,467	67.4%
2014	59,330	36,783	61.7%	18,560	8,704	68.1%
2015	58,960	35,560	62.4%	18,308	9,361	66.2%
Total	358,476	226,414	61.3%	121,571	57,207	68.0%

Source: London Economics based on TED transactions and Orbis database.
Note: Totals are not comparable to Table 12 as country of ownership could not be exactly identified for all indirect cross-border contract awards.

The top 3 non-EU countries for country of ownership of indirect cross-border awards (both in terms of number and value of awards) were the US, Switzerland and Japan.

These mostly overlap with the top 3 non-EU countries for country of ownership of indirect cross-border awards in terms of value of awards with the exception of Japan which replaces Norway and Canada. This shows that the non-EU countries which engage in indirect and direct cross-border procurement may differ. For instance, although firms from Japan do not constitute a large share of direct cross-border procurement in most EU28 countries, between 1% and 5% of indirect cross-border procurement in the majority of EU28 countries was in firms with Japanese owners.

was not always possible to allocate ownership to a specific country i.e. a British firm with both French and Spanish owners can be identified as having foreign ownership, but it is not always possible to determine whether the actual country of ownership is France or Spain.

Table 22: Top 3 non-EU countries for firm ownership for number and value of indirect cross-border awards, 2009 to 2015

Top 3 non-EU countries	
In terms of contract numbers	**In terms of contract values**
US	US
Switzerland	Switzerland
Japan	Japan

Source: London Economics based on TED transactions and Orbis database.

A more detailed breakdown of direct and indirect cross-border procurement by major non-EU country is provided in section 3.4.5.

3.4.4. Bilateral analysis of cross-border procurement: contracting authority perspective

To explore cross-country relationships in greater depth, the number and value of direct and indirect cross-border contracts between 2009 and 2015 are broken down by country of contracting authority and by country of award winner. Table 23 and Table 24 overleaf show, for direct cross-border contracts, country of contract winners in columns and country of awarding authorities in rows.

Each cell represents the percentage of cross border awards that the row awarding authority attributed to firms of the column country.[35]

The tables highlight with darker shades of green the cells with higher values. One darker shaded column corresponds to German firms. This column indicates that German firms win a high percentage of direct cross-border contracts from several contracting authorities, compared to firms from most other countries.

The tables can also be used to infer the extent to which direct cross-border contract awards are procured from EU based firms. This indicator varies substantially across countries: while only 3% of Luxembourg's direct cross-border procurement is awarded to non-EU28 firms, this percentage is 42% in the UK.

Similarly, Table 25 and Table 26 overleaf show, for indirect cross-border contracts, country of ownership of contract winners in columns and country of awarding authorities in rows. Each cell represents the percentage of cross border awards that the row awarding authority attributed to firms owned by the column country.

The four tables have some similarities. German firms take a high percentage of all cross-border contracts for most authorities, generally followed by French and UK firms. Non-EU firms also take a substantial share of the cross-border wins, across the generality of awarding authorities and this is most pronounced in terms of indirect cross border awards.

In terms of bilateral relationships, we observe patterns that mimic those encountered in trade statistics. For example, Cypriot authorities award a high percentage of cross border contracts to Greek firms, Slovakian authorities to Czech firms and Irish authorities to UK firms, to name a few examples.

35 For instance in the first row, the column corresponding to Germany can be read as: 64% of the number of direct cross-border contracts awarded by Austrian authorities were given to German firms.

Table 23: Distribution of direct cross-border procurement per country of successful bidder, in % of total number of direct cross-border contracts awarded in each EU28 country

Country of contracting authority \ Country of contract winner	AT	BE	BG	HR	CY	CZ	DK	EE	FI	FR	DE	EL	HU	IE	IT	LV	LT	LU	MT	NL	PL	PT	RO	SK	SI	ES	SE	UK	X-EU
AT		1%	0%	1%	0%	1%	1%	0%	0%	3%	64%	0%	2%	0%	8%	0%	1%	0%	0%	3%	1%	0%	0%	1%	5%	1%	1%	1%	6%
BE	1%		1%	0%	0%	1%	1%	0%	0%	31%	14%	0%	0%	1%	4%	0%	0%	3%	0%	29%	1%	0%	0%	0%	0%	3%	1%	5%	5%
BG	9%	7%		1%	0%	9%	0%	0%	1%	5%	17%	3%	1%	0%	6%	0%	0%	0%	0%	3%	3%	0%	3%	0%	0%	3%	0%	5%	20%
HR	12%	3%	0%		1%	3%	1%	0%	1%	8%	15%	1%	2%	0%	13%	0%	0%	0%	0%	4%	1%	0%	0%	1%	14%	3%	1%	1%	17%
CY	1%	0%	0%	1%		0%	1%	0%	2%	1%	5%	68%	1%	0%	3%	0%	0%	1%	0%	1%	0%	0%	0%	0%	0%	2%	0%	7%	5%
CZ	5%	1%	1%	0%	0%		0%	0%	0%	5%	16%	0%	1%	0%	1%	0%	13%	0%	0%	3%	9%	0%	0%	15%	0%	0%	0%	4%	25%
DK	2%	2%	0%	0%	0%	1%		0%	2%	6%	12%	0%	0%	1%	2%	0%	0%	0%	0%	5%	3%	0%	0%	0%	1%	1%	33%	13%	17%
EE	1%	2%	0%	0%	0%	2%	2%		17%	5%	13%	0%	0%	0%	1%	10%	7%	0%	0%	6%	4%	0%	0%	0%	0%	1%	6%	6%	16%
FI	1%	3%	0%	0%	0%	1%	8%	6%		5%	9%	0%	0%	0%	1%	0%	1%	0%	0%	3%	1%	0%	0%	0%	0%	1%	29%	7%	22%
FR	1%	9%	0%	0%	0%	0%	2%	0%	0%		12%	0%	0%	2%	9%	0%	0%	1%	0%	5%	2%	1%	0%	0%	0%	3%	5%	7%	40%
DE	21%	2%	1%	0%	0%	3%	3%	1%	1%	8%		1%	4%	2%	4%	0%	0%	1%	0%	12%	2%	0%	0%	0%	1%	3%	2%	6%	22%
EL	2%	2%	2%	5%	7%	2%	0%	0%	2%	11%	13%		0%	1%	15%	0%	0%	0%	0%	9%	2%	1%	2%	0%	0%	3%	2%	6%	12%
HU	19%	2%	0%	2%	0%	9%	0%	0%	1%	6%	19%	0%		0%	3%	0%	0%	0%	1%	6%	6%	0%	3%	4%	1%	1%	0%	5%	13%
IE	0%	1%	0%	0%	0%	0%	1%	0%	1%	2%	3%	0%	0%		1%	0%	0%	0%	0%	2%	0%	0%	0%	0%	0%	1%	0%	75%	12%
IT	7%	2%	0%	1%	0%	1%	2%	0%	0%	33%	6%	0%	0%	2%		1%	1%	0%	0%	3%	5%	0%	1%	0%	0%	3%	5%	9%	16%
LV	1%	1%	0%	1%	0%	4%	3%	21%	13%	2%	7%	0%	0%	0%	1%		24%	0%	0%	2%	4%	0%	0%	0%	0%	0%	2%	4%	10%
LT	1%	1%	0%	0%	0%	6%	2%	11%	3%	2%	11%	0%	0%	1%	2%	23%		1%	0%	4%	8%	0%	0%	0%	0%	3%	3%	9%	9%
LU	2%	20%	0%	0%	0%	0%	0%	0%	0%	10%	53%	0%	0%	2%	1%	0%	0%		0%	4%	0%	0%	0%	0%	0%	1%	0%	3%	3%
MT	1%	1%	0%	1%	0%	0%	2%	0%	0%	7%	9%	3%	0%	2%	29%	0%	0%	2%		1%	0%	2%	2%	0%	0%	3%	1%	23%	8%
NL	2%	22%	0%	0%	0%	1%	1%	0%	1%	7%	23%	0%	0%	1%	2%	0%	0%	1%	0%		0%	0%	0%	0%	0%	4%	1%	13%	18%
PL	2%	3%	0%	0%	1%	8%	0%	0%	0%	5%	15%	0%	0%	5%	5%	0%	1%	0%	0%	3%		2%	1%	1%	0%	2%	1%	34%	11%
PT	1%	2%	0%	0%	0%	0%	1%	0%	1%	13%	12%	1%	0%	1%	4%	0%	0%	0%	0%	3%	3%		1%	0%	0%	40%	5%	4%	9%
RO	7%	3%	0%	0%	0%	2%	0%	0%	0%	6%	15%	2%	5%	0%	23%	0%	0%	1%	0%	4%	2%	1%		0%	0%	7%	1%	5%	15%
SK	4%	0%	0%	0%	0%	69%	0%	0%	0%	2%	8%	0%	2%	0%	2%	0%	0%	0%	0%	1%	3%	0%	0%		0%	0%	0%	2%	5%
SI	12%	2%	0%	8%	0%	3%	0%	0%	1%	7%	16%	0%	8%	0%	10%	0%	0%	0%	0%	9%	0%	0%	0%	1%		2%	1%	6%	13%
ES	1%	5%	0%	1%	0%	0%	4%	1%	4%	33%	9%	2%	0%	2%	8%	0%	0%	0%	0%	9%	2%	2%	0%	0%	0%		1%	9%	7%
SE	2%	1%	0%	0%	0%	1%	28%	1%	7%	5%	13%	0%	0%	1%	2%	0%	0%	0%	0%	5%	1%	0%	0%	0%	1%	1%		11%	19%
UK	1%	3%	0%	0%	0%	0%	2%	0%	1%	7%	10%	0%	0%	22%	2%	0%	0%	0%	0%	5%	1%	0%	0%	0%	0%	1%	2%		42%

Source: London Economics based on TED transactions and Orbis database.
Note: Country of contracting authorities in rows and country of ownership of successful bidder in columns. Stronger green shades represent higher incidence of the respective contracting authority awarding its direct cross border contracts to bidders from the respective column country. "X-EU" aggregates all non-EU-owned bidders. Rows in table do not sum to 100% due to rounding: there are several countries with shares lower than 0.5% that therefore round to zero in the table.

Table 24: Distribution of direct cross-border procurement per country of successful bidder, in % of total value of direct cross-border contracts awarded in each EU28 country

Country of contracting authority	Country of contract winner: AT	BE	BG	HR	CY	CZ	DK	EE	FI	FR	DE	EL	HU	IE	IT	LV	LT	LU	MT	NL	PL	PT	RO	SK	SI	ES	SE	UK	X-EU
AT		1%	0%	0%	0%	4%	0%	0%	1%	4%	63%	0%	1%	0%	6%	0%	1%	0%	0%	4%	0%	0%	0%	1%	2%	2%	0%	2%	8%
BE	2%		1%	0%	1%	1%	0%	1%	1%	24%	13%	0%	0%	1%	5%	0%	0%	7%	0%	24%	1%	0%	0%	0%	0%	4%	1%	4%	9%
BG	6%	2%		0%	1%	19%	0%	1%	0%	3%	20%	2%	0%	0%	6%	0%	0%	0%	0%	3%	7%	0%	4%	0%	0%	5%	0%	2%	16%
HR	17%	0%	0%		3%	3%	5%	0%	0%	3%	13%	0%	0%	0%	16%	0%	0%	0%	0%	2%	2%	0%	0%	3%	1%	4%	0%	0%	28%
CY	1%	0%	0%	4%		0%	1%	0%	4%	1%	10%	44%	0%	0%	2%	0%	0%	0%	0%	0%	0%	0%	5%	0%	0%	6%	0%	7%	15%
CZ	11%	1%	2%	0%	0%		0%	0%	0%	7%	20%	0%	1%	0%	3%	0%	0%	0%	0%	4%	16%	0%	0%	0%	17%	0%	0%	3%	13%
DK	1%	2%	0%	0%	0%	0%		1%	1%	4%	10%	0%	0%	0%	1%	0%	0%	0%	0%	6%	3%	0%	0%	1%	0%	3%	39%	7%	21%
EE	3%	0%	0%	0%	0%	7%	1%		21%	2%	16%	0%	0%	0%	2%	6%	2%	0%	0%	9%	9%	0%	0%	0%	0%	1%	3%	6%	11%
FI	1%	2%	0%	0%	0%	4%	6%	3%		10%	14%	0%	0%	0%	1%	0%	0%	0%	0%	6%	1%	0%	0%	0%	0%	2%	22%	5%	22%
FR	1%	8%	1%	0%	0%	0%	2%	0%	1%		10%	1%	0%	1%	9%	0%	0%	1%	0%	3%	3%	1%	0%	0%	0%	6%	3%	6%	42%
DE	34%	3%	0%	1%	0%	1%	4%	1%	2%	6%		1%	2%	2%	2%	0%	0%	1%	0%	8%	3%	0%	0%	0%	0%	2%	1%	4%	23%
EL	10%	2%	2%	5%	6%	1%	0%	0%	6%	9%	9%		0%	0%	20%	0%	0%	0%	0%	3%	1%	2%	2%	0%	0%	3%	1%	5%	13%
HU	16%	1%	1%	3%	0%	8%	0%	0%	2%	8%	17%	0%		0%	7%	0%	0%	0%	0%	7%	9%	0%	1%	3%	1%	1%	0%	1%	13%
IE	0%	1%	0%	0%	0%	0%	0%	0%	0%	1%	3%	0%	0%		0%	0%	0%	0%	0%	6%	0%	0%	0%	0%	0%	0%	1%	75%	11%
IT	7%	2%	0%	3%	0%	1%	2%	0%	0%	19%	9%	1%	0%	5%		0%	0%	0%	0%	2%	3%	1%	2%	0%	0%	6%	2%	15%	18%
LV	0%	1%	0%	0%	0%	1%	6%	15%	7%	2%	12%	0%	0%	0%	3%		24%	0%	0%	3%	4%	0%	0%	0%	0%	0%	3%	1%	16%
LT	2%	1%	0%	0%	0%	4%	3%	6%	2%	1%	15%	0%	0%	0%	7%	19%		1%	0%	2%	10%	0%	0%	0%	0%	8%	2%	6%	11%
LU	2%	20%	0%	0%	0%	0%	0%	0%	0%	6%	63%	0%	0%	1%	0%	0%	0%		0%	1%	0%	0%	0%	0%	0%	1%	0%	1%	6%
MT	2%	7%	0%	0%	0%	0%	0%	0%	1%	4%	16%	1%	0%	0%	33%	0%	0%	0%		0%	0%	4%	1%	0%	0%	2%	0%	10%	17%
NL	6%	21%	0%	0%	0%	1%	4%	0%	1%	3%	25%	0%	0%	3%	3%	0%	1%	1%	0%		0%	0%	0%	0%	0%	3%	0%	12%	17%
PL	5%	2%	0%	0%	2%	9%	1%	0%	1%	5%	23%	0%	0%	2%	4%	0%	1%	0%	0%	6%		2%	3%	1%	1%	10%	1%	7%	13%
PT	1%	1%	0%	0%	0%	0%	0%	0%	0%	4%	8%	3%	0%	3%	1%	0%	0%	0%	0%	1%	1%		0%	0%	0%	68%	0%	1%	7%
RO	10%	2%	1%	1%	0%	1%	0%	0%	0%	3%	16%	1%	5%	0%	21%	0%	0%	1%	0%	3%	2%	1%		0%	0%	15%	1%	4%	13%
SK	9%	3%	0%	8%	0%	8%	0%	0%	1%	9%	11%	0%	17%	0%	3%	0%	0%	0%	0%	5%	0%	0%	0%		0%	4%	1%	4%	17%
SI	3%	0%	0%	0%	1%	65%	0%	0%	1%	2%	8%	0%	3%	0%	1%	0%	0%	0%	0%	0%	6%	0%	0%	0%		0%	0%	1%	8%
ES	1%	4%	0%	0%	0%	1%	10%	0%	2%	24%	10%	1%	0%	4%	10%	0%	0%	0%	0%	12%	1%	2%	0%	0%	0%		1%	6%	10%
SE	2%	0%	0%	0%	0%	4%	22%	0%	10%	3%	9%	0%	0%	2%	4%	0%	2%	0%	0%	6%	1%	0%	0%	0%	0%	4%		8%	23%
UK	2%	3%	0%	0%	0%	0%	2%	0%	1%	4%	7%	1%	1%	20%	1%	0%	0%	0%	0%	5%	1%	1%	0%	0%	0%	1%	1%		50%

Source: London Economics based on TED transactions and Orbis database.
Note: Country of contracting authorities in rows and country of ownership of successful bidder in columns. Stronger green shades represent higher incidence of the respective contracting authority awarding its direct cross border contracts to bidders from the respective column country. "X-EU" aggregates all non-EU-owned bidders. Rows in table do not sum to 100% due to rounding: there are several countries with shares lower than 0.5% that therefore round to zero in the table.

Table 25: Distribution of indirect cross-border procurement per country of ownership of successful bidder, in % of total number of indirect cross-border contracts awarded in each EU28 country

Country of contracting authority \ Country of owner of contract winner	AT	BE	BG	HR	CY	CZ	DK	EE	FI	FR	DE	EL	HU	IE	IT	LV	LT	LU	MT	NL	PL	PT	RO	SK	SI	ES	SE	UK	X-EU
AT		1%	0%	0%	0%	0%	3%	0%	4%	6%	32%	0%	3%	2%	3%	0%	0%	4%	0%	5%	0%	0%	0%	1%	0%	5%	1%	7%	24%
BE	1%		0%	0%	0%	0%	2%	0%	1%	30%	9%	0%	0%	1%	3%	0%	0%	5%	0%	17%	0%	0%	0%	0%	0%	0%	4%	5%	23%
BG	6%	1%		0%	10%	2%	0%	0%	0%	1%	45%	2%	1%	0%	4%	0%	0%	0%	0%	4%	3%	0%	0%	0%	0%	1%	0%	1%	17%
HR	4%	0%	0%		0%	0%	0%	0%	0%	1%	58%	0%	4%	0%	8%	0%	0%	1%	0%	0%	0%	0%	0%	0%	3%	0%	1%	0%	19%
CY	0%	6%	0%	0%		0%	0%	0%	12%	3%	1%	44%	0%	0%	0%	0%	0%	1%	0%	0%	0%	0%	0%	0%	0%	0%	1%	7%	25%
CZ	15%	1%	0%	0%	4%		1%	0%	0%	8%	22%	0%	0%	0%	2%	0%	0%	3%	0%	5%	2%	0%	0%	4%	0%	2%	3%	3%	23%
DK	0%	0%	0%	0%	0%	0%		0%	5%	4%	10%	0%	0%	2%	0%	0%	0%	0%	0%	2%	0%	0%	0%	0%	0%	0%	20%	13%	43%
EE	0%	0%	0%	0%	0%	0%	3%		25%	2%	15%	0%	0%	0%	0%	3%	5%	2%	0%	2%	1%	0%	0%	0%	0%	0%	20%	4%	18%
FI	0%	0%	0%	0%	0%	0%	12%	0%		5%	9%	0%	0%	2%	0%	0%	0%	0%	0%	3%	0%	0%	0%	0%	0%	0%	29%	6%	32%
FR	0%	6%	0%	0%	0%	0%	3%	0%	0%		14%	0%	0%	5%	2%	0%	0%	7%	0%	6%	0%	1%	0%	0%	0%	1%	2%	6%	46%
DE	10%	1%	0%	0%	0%	0%	1%	0%	2%	12%		0%	0%	2%	3%	0%	0%	2%	0%	11%	0%	1%	0%	0%	1%	1%	3%	4%	46%
EL	0%	10%	0%	0%	16%	0%	3%	0%	0%	6%	14%		0%	2%	5%	0%	0%	1%	0%	8%	0%	0%	0%	0%	0%	0%	1%	2%	33%
HU	15%	1%	0%	0%	0%	1%	0%	0%	0%	10%	32%	0%		1%	5%	0%	0%	0%	0%	4%	0%	0%	0%	1%	0%	1%	4%	3%	20%
IE	0%	0%	0%	0%	0%	0%	2%	0%	0%	7%	9%	0%	0%		0%	0%	0%	3%	0%	2%	0%	0%	0%	0%	0%	0%	1%	38%	35%
IT	0%	1%	0%	0%	0%	0%	2%	0%	0%	10%	14%	1%	0%	6%		0%	0%	2%	0%	6%	0%	0%	0%	0%	0%	1%	2%	5%	49%
LV	0%	0%	5%	0%	1%	0%	0%	28%	6%	0%	22%	0%	0%	0%	0%		9%	0%	0%	0%	1%	0%	0%	0%	0%	0%	6%	2%	18%
LT	0%	0%	0%	0%	6%	0%	0%	1%	2%	0%	2%	0%	0%	0%	0%	2%		0%	0%	0%	35%	0%	0%	0%	0%	0%	8%	2%	40%
LU	0%	16%	0%	0%	0%	0%	0%	0%	2%	20%	36%	1%	0%	0%	0%	0%	0%		0%	7%	0%	0%	0%	0%	0%	1%	0%	2%	14%
MT	0%	0%	0%	0%	24%	0%	0%	0%	0%	0%	0%	0%	0%	0%	47%	0%	0%	0%		6%	0%	0%	0%	0%	0%	0%	0%	24%	0%
NL	2%	4%	0%	0%	0%	0%	2%	0%	1%	19%	14%	0%	0%	2%	1%	0%	0%	5%	0%		0%	0%	0%	0%	0%	0%	6%	12%	32%
PL	1%	0%	0%	0%	0%	0%	0%	0%	0%	10%	28%	0%	0%	5%	1%	0%	0%	1%	0%	7%		0%	0%	2%	0%	1%	2%	6%	34%
PT	1%	1%	0%	0%	0%	0%	1%	0%	0%	6%	13%	0%	0%	6%	1%	0%	0%	2%	0%	4%	0%		0%	0%	0%	14%	2%	7%	41%
RO	2%	0%	0%	0%	26%	0%	0%	0%	0%	1%	14%	2%	6%	5%	2%	0%	0%	0%	0%	1%	1%	0%		0%	0%	1%	0%	6%	32%
SK	14%	1%	0%	0%	2%	27%	1%	0%	0%	9%	21%	0%	3%	0%	1%	0%	0%	1%	0%	1%	2%	0%	0%		0%	1%	1%	2%	13%
SI	7%	0%	0%	38%	2%	0%	1%	0%	0%	4%	7%	0%	0%	0%	5%	0%	0%	0%	0%	7%	0%	0%	0%	0%		0%	2%	0%	26%
ES	0%	1%	0%	0%	0%	0%	2%	0%	0%	11%	14%	0%	0%	5%	4%	0%	0%	1%	0%	5%	0%	2%	0%	0%	0%		2%	6%	44%
SE	0%	1%	0%	0%	1%	0%	17%	0%	8%	6%	9%	0%	0%	2%	0%	0%	0%	1%	0%	6%	0%	0%	0%	0%	0%	0%		10%	38%
UK	0%	1%	0%	0%	0%	0%	1%	0%	1%	10%	11%	0%	0%	6%	2%	0%	0%	2%	0%	6%	0%	0%	0%	0%	0%	2%	2%		55%

Source: London Economics based on TED transactions and Orbis database.

Note Country of contracting authorities in rows and country of ownership of successful bidder in columns. Stronger green shades represent higher incidence of the respective contracting authority awarding its direct cross border contracts to bidders from the respective column country. ”X-EU” aggregates all non-EU-owned bidders. Rows in table do not sum to 100% due to rounding: there are several countries with shares lower than 0.5% that therefore round to zero in the table.

Table 26: Distribution of indirect cross-border procurement per country of ownership of successful bidder, in % of total value of indirect cross-border contracts awarded in each EU28 country

Country of contracting authority \ Country of owner of contract winner	AT	BE	BG	HR	CY	CZ	DK	EE	FI	FR	DE	EL	HU	IE	IT	LV	LT	LU	MT	NL	PL	PT	RO	SK	SI	ES	SE	UK	X-EU
AT		0%	0%	0%	0%	0%	7%	0%	2%	11%	30%	0%	3%	2%	4%	0%	0%	1%	0%	4%	0%	0%	0%	0%	0%	8%	2%	7%	21%
BE	2%		0%	0%	0%	0%	1%	0%	0%	37%	6%	0%	0%	0%	3%	0%	0%	5%	0%	28%	0%	0%	0%	0%	0%	1%	2%	3%	12%
BG	7%	1%		0%	8%	5%	0%	0%	0%	1%	19%	1%	1%	0%	3%	0%	0%	6%	0%	3%	0%	0%	0%	0%	0%	1%	2%	3%	36%
HR	11%	0%	0%		0%	0%	0%	0%	0%	7%	17%	0%	21%	0%	17%	0%	0%	0%	0%	2%	0%	0%	0%	3%	0%	0%	2%	1%	19%
CY	0%	2%	0%	0%		0%	0%	0%	1%	3%	4%	44%	0%	0%	0%	0%	0%	1%	0%	0%	0%	0%	0%	0%	0%	0%	0%	5%	40%
CZ	16%	2%	0%	0%	9%		1%	0%	1%	11%	17%	0%	1%	0%	1%	0%	0%	3%	0%	6%	2%	0%	0%	0%	2%	4%	4%	3%	16%
DK	1%	0%	0%	0%	0%	0%		0%	3%	5%	10%	0%	0%	0%	0%	0%	0%	0%	0%	1%	0%	0%	0%	0%	0%	0%	23%	11%	45%
EE	0%	0%	0%	0%	0%	0%	3%		23%	5%	12%	0%	0%	1%	0%	6%	2%	5%	0%	3%	2%	0%	0%	0%	0%	0%	19%	3%	17%
FI	0%	0%	0%	0%	0%	0%	6%	1%		6%	4%	0%	0%	2%	1%	0%	0%	0%	0%	3%	0%	0%	0%	0%	0%	0%	49%	7%	20%
FR	1%	5%	0%	0%	0%	0%	1%	0%	0%		12%	0%	0%	3%	3%	0%	0%	13%	0%	8%	0%	1%	0%	0%	0%	1%	2%	9%	41%
DE	21%	1%	0%	0%	0%	0%	1%	0%	3%	14%		0%	0%	0%	2%	0%	0%	2%	0%	16%	0%	0%	0%	0%	0%	3%	2%	5%	29%
EL	0%	22%	0%	0%	21%	0%	3%	0%	0%	3%	11%		0%	3%	1%	0%	0%	2%	0%	6%	0%	0%	0%	0%	0%	1%	1%	4%	23%
HU	22%	1%	0%	0%	1%	0%	1%	0%	0%	14%	35%	0%		1%	5%	0%	0%	1%	0%	3%	0%	0%	0%	0%	1%	1%	1%	3%	12%
IE	3%	0%	0%	0%	0%	0%	3%	0%	0%	8%	4%	0%	0%		0%	0%	0%	3%	1%	10%	0%	2%	0%	0%	0%	0%	0%	37%	28%
IT	0%	0%	0%	0%	0%	0%	0%	0%	1%	20%	13%	0%	0%	3%		0%	0%	3%	0%	6%	0%	0%	0%	0%	0%	1%	2%	7%	42%
LV	1%	0%	2%	0%	3%	1%	0%	19%	7%	0%	13%	0%	0%	0%	0%		8%	0%	2%	0%	3%	0%	0%	0%	0%	1%	8%	3%	29%
LT	2%	0%	0%	0%	1%	0%	1%	6%	9%	2%	5%	0%	0%	0%	0%	3%		0%	0%	2%	16%	0%	0%	0%	0%	0%	14%	5%	34%
LU	0%	19%	0%	0%	0%	0%	0%	0%	2%	21%	34%	1%	0%	0%	0%	0%	0%		0%	12%	0%	0%	0%	0%	0%	1%	0%	1%	8%
MT	0%	0%	0%	0%	2%	0%	0%	0%	0%	0%	0%	0%	0%	0%	72%	0%	0%	0%		0%	0%	0%	0%	0%	0%	0%	0%	26%	0%
NL	3%	5%	0%	0%	0%	0%	2%	0%	0%	18%	19%	0%	0%	2%	0%	0%	0%	4%	0%		0%	0%	0%	0%	0%	0%	4%	9%	32%
PL	6%	0%	0%	0%	1%	0%	1%	0%	1%	11%	21%	0%	0%	1%	3%	0%	0%	4%	0%	4%		1%	0%	0%	0%	9%	9%	4%	22%
PT	0%	0%	0%	0%	0%	0%	3%	0%	1%	7%	9%	0%	0%	1%	1%	0%	0%	3%	1%	8%	0%		0%	0%	0%	23%	2%	6%	35%
RO	14%	0%	0%	0%	20%	0%	1%	0%	0%	8%	12%	2%	2%	3%	3%	0%	0%	1%	0%	4%	0%	0%		0%	0%	1%	0%	3%	26%
SK	16%	0%	0%	9%	1%	0%	3%	0%	0%	6%	11%	0%	0%	0%	9%	0%	0%	0%	0%	3%	0%	0%	0%		0%	0%	0%	1%	41%
SI	19%	0%	0%	0%	2%	15%	3%	0%	0%	14%	19%	0%	5%	0%	1%	0%	0%	0%	0%	1%	2%	0%	0%	0%		0%	3%	2%	13%
ES	0%	1%	0%	0%	0%	0%	3%	0%	1%	14%	11%	0%	0%	2%	7%	0%	0%	2%	0%	7%	0%	4%	0%	0%	0%		2%	7%	38%
SE	2%	0%	0%	0%	1%	0%	11%	0%	10%	10%	10%	0%	0%	0%	0%	0%	0%	1%	0%	4%	0%	0%	0%	0%	0%	0%		7%	43%
UK	0%	1%	0%	0%	0%	0%	2%	0%	1%	15%	10%	0%	0%	5%	2%	0%	0%	3%	1%	9%	0%	0%	0%	0%	0%	4%	2%		47%

Source: London Economics based on TED transactions and Orbis database.
Note: Country of contracting authorities in rows and country of ownership of successful bidder in columns. Stronger green shades represent higher incidence of the respective contracting authority awarding its direct cross border contracts to bidders from the respective column country. "X-EU" aggregates all non-EU-owned bidders. Rows in table do not sum to 100% due to rounding: there are several countries with shares lower than 0.5% that therefore round to zero in the table.

3.4.5. Contract winners from selected non-EU Member States, by country of contracting authority

The tables below report on the split of cross-border contract wins for a selection of non-EU partner countries, per contracting authority between 2009 and 2015.

Patterns of historic and geographic relationships are apparent for both direct and indirect cross-border relationships: for instance, Denmark's and Sweden's cross-border contracts were most often awarded to Norwegian firms, at 7.7% and 9.7% for direct cross-border and 7.1% and 7.9% for indirect cross-border, respectively.

The US and Switzerland stand out as being the sources of a relatively large share of both direct and indirect cross-border procurement, attracting 3.8% and 3.2%, respectively, of direct cross-border contracts and 21.8% and 6% of indirect cross-border contracts.

Table 27: Direct cross-border awards to selected extra-EU partners as a percentage of total number of direct cross-border awards, EU28

Country	Canada	China	Japan	Norway	Switzerland	US
Austria	0.2%	0.0%	0.0%	0.3%	4.1%	0.6%
Belgium	0.5%	0.0%	0.2%	0.5%	1.4%	0.9%
Bulgaria	0.0%	0.0%	0.0%	0.2%	8.0%	1.7%
Croatia	0.6%	0.6%	1.3%	0.0%	2.5%	8.7%
Cyprus	0.0%	2.2%	0.0%	0.0%	0.5%	0.5%
Czech R.	0.9%	0.1%	0.1%	1.2%	1.5%	5.1%
Denmark	1.0%	0.1%	0.0%	7.7%	1.4%	3.4%
Estonia	0.4%	0.5%	0.1%	0.9%	4.2%	6.9%
Finland	0.4%	0.1%	0.1%	1.5%	1.5%	13.9%
France	0.7%	0.2%	0.2%	0.3%	2.9%	1.5%
Germany	0.7%	0.2%	0.7%	0.4%	8.6%	5.9%
Greece	0.9%	0.3%	0.0%	1.2%	3.4%	1.9%
Hungary	0.3%	0.1%	0.1%	1.2%	2.1%	5.0%
Ireland	0.9%	0.2%	0.0%	0.3%	0.7%	3.0%
Italy	0.4%	0.5%	0.3%	0.3%	5.1%	3.4%
Latvia	0.2%	0.1%	0.0%	1.1%	0.7%	1.5%
Lithuania	0.3%	0.2%	0.2%	0.3%	0.7%	4.4%
Luxembourg	0.0%	0.0%	0.0%	0.0%	1.3%	0.0%
Malta	0.0%	0.5%	0.0%	0.5%	0.0%	0.5%
Netherlands	0.7%	0.2%	0.0%	0.8%	3.1%	7.4%
Poland	0.4%	0.1%	0.1%	1.1%	5.5%	1.9%
Portugal	1.1%	0.4%	0.0%	0.7%	1.3%	2.6%
Romania	4.5%	0.3%	0.1%	0.3%	1.9%	4.4%
Slovakia	0.5%	0.2%	0.1%	0.1%	0.7%	1.9%
Slovenia	0.1%	0.0%	0.4%	0.9%	2.9%	4.3%
Spain	0.3%	0.1%	0.1%	0.3%	1.6%	3.6%
Sweden	0.8%	0.3%	0.4%	9.7%	1.8%	3.3%
U.K.	1.4%	1.0%	0.1%	0.7%	2.3%	12.2%
EU	0.7%	0.3%	0.2%	1.1%	3.2%	3.8%

Source: London Economics based on TED transactions and Orbis database.
Note: Stronger green shading represents a high value relative to average values in the tables.

It can also be observed that although firms from Japan do not constitute a large share of direct cross-border procurement in most EU28 countries, the share of indirect cross-border procurement awarded to firms with Japanese owners[36] was higher (2.7%).

Table 28: Indirect cross-border awards to selected extra-EU partners as a percentage of total number of indirect cross-border awards, EU28

Country	Canada	China	Japan	Norway	Switzerland	US
Austria	0.1%	0.0%	2.3%	0.0%	8.4%	10.6%
Belgium	0.2%	0.0%	4.9%	0.2%	1.6%	10.6%
Bulgaria	0.0%	0.0%	0.1%	0.2%	1.9%	2.7%
Croatia	0.0%	0.0%	3.3%	0.0%	4.3%	8.4%
Cyprus	0.0%	0.0%	0.6%	0.0%	1.2%	16.8%
Czech R.	0.1%	0.1%	2.8%	0.0%	4.0%	11.7%
Denmark	0.7%	0.0%	2.4%	7.1%	6.7%	23.8%
Estonia	0.0%	0.0%	1.6%	5.0%	2.9%	5.5%
Finland	2.6%	0.0%	3.5%	3.3%	4.4%	16.7%
France	0.3%	0.0%	4.2%	0.3%	7.2%	30.4%
Germany	0.5%	0.1%	6.3%	0.3%	11.6%	15.3%
Greece	0.0%	0.0%	1.3%	0.0%	11.5%	18.6%
Hungary	0.3%	0.0%	1.4%	0.3%	4.0%	11.9%
Ireland	0.3%	0.0%	2.3%	0.2%	1.5%	27.1%
Italy	0.2%	0.0%	1.8%	0.2%	8.1%	35.7%
Latvia	0.0%	0.0%	0.6%	4.0%	0.2%	3.4%
Lithuania	0.0%	0.0%	0.1%	5.0%	1.0%	2.9%
Luxembourg	0.0%	0.0%	3.1%	0.0%	2.7%	1.9%
Netherlands	1.6%	0.4%	7.1%	0.5%	2.2%	11.2%
Poland	0.4%	0.0%	1.9%	0.1%	7.5%	23.5%
Portugal	0.5%	0.0%	3.3%	0.1%	6.7%	22.0%
Romania	0.0%	0.1%	0.0%	0.0%	1.5%	6.1%
Slovakia	0.0%	0.0%	0.6%	0.0%	2.2%	7.8%
Slovenia	0.1%	0.0%	2.0%	0.0%	3.1%	15.3%
Spain	0.4%	0.0%	4.7%	0.1%	7.0%	28.5%
Sweden	1.6%	0.1%	2.3%	7.9%	4.3%	19.8%
UK	1.8%	0.1%	3.3%	0.5%	5.1%	34.8%
EU	0.4%	0.0%	2.7%	0.7%	6.0%	21.8%

Source: London Economics based on TED transactions and Orbis database.
Note: Stronger green shading represents a high value relative to average values in the tables.

3.4.6. Level of cross-border procurement, by NUTS1 and NUTS2 region

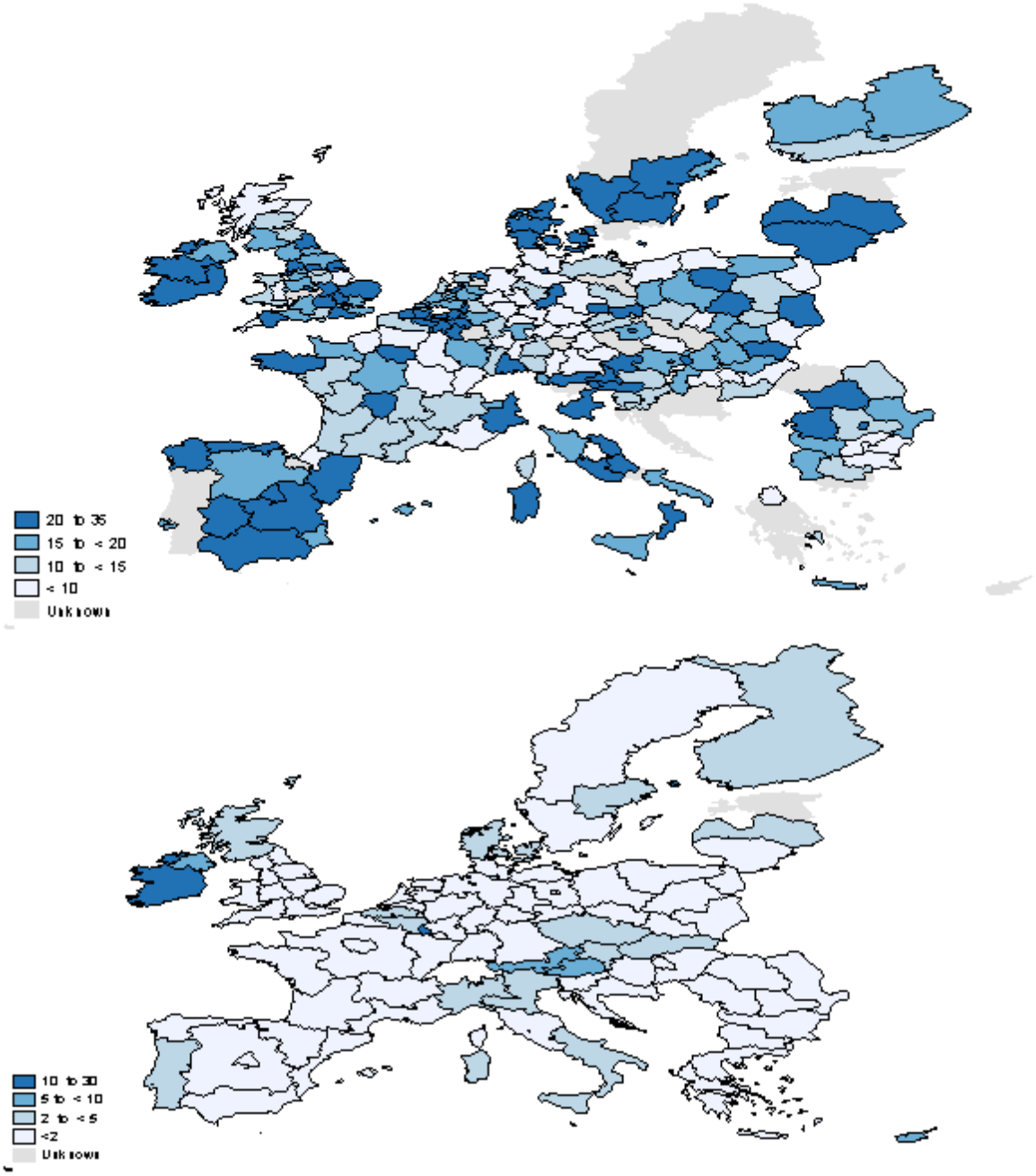
In Figure 11 and Figure 12 below, the shares of direct and indirect cross-border procurement are analysed by location where the contract work took place[37] in terms of Nomenclature of territorial units (NUTS) codes.[38]

36 The only exceptions are Bulgaria, Cyprus, Romania, Slovakia, Lithuania and Latvia.
37 Defined as the "Main site or location of work, place of delivery or of performance".
38 The NUTS classification (Nomenclature of territorial units for statistics) is a hierarchical system for dividing up the economic territory of the EU. Nuts level 1 classifies major socio-economic regions; and NUTS level 2 - basic regions for the application of regional policies. For more information, please see http://ec.europa.eu/eurostat/web/nuts/overview.

It can be observed that there are substantial differences within regions in the levels of direct and indirect cross-border procurements if we consider the NUTS 2 level breakdown. However, this may be driven by the small sample of cross-border contracts which were recorded with that degree of detail. Indeed, these differentials become considerably smaller when the NUTS 1 level breakdown is instead considered.[39] Interestingly, despite the findings that cross-border relationships appear to depend on geographical proximity, there appears to be little evidence that border regions are more likely to engage in cross-border procurement.

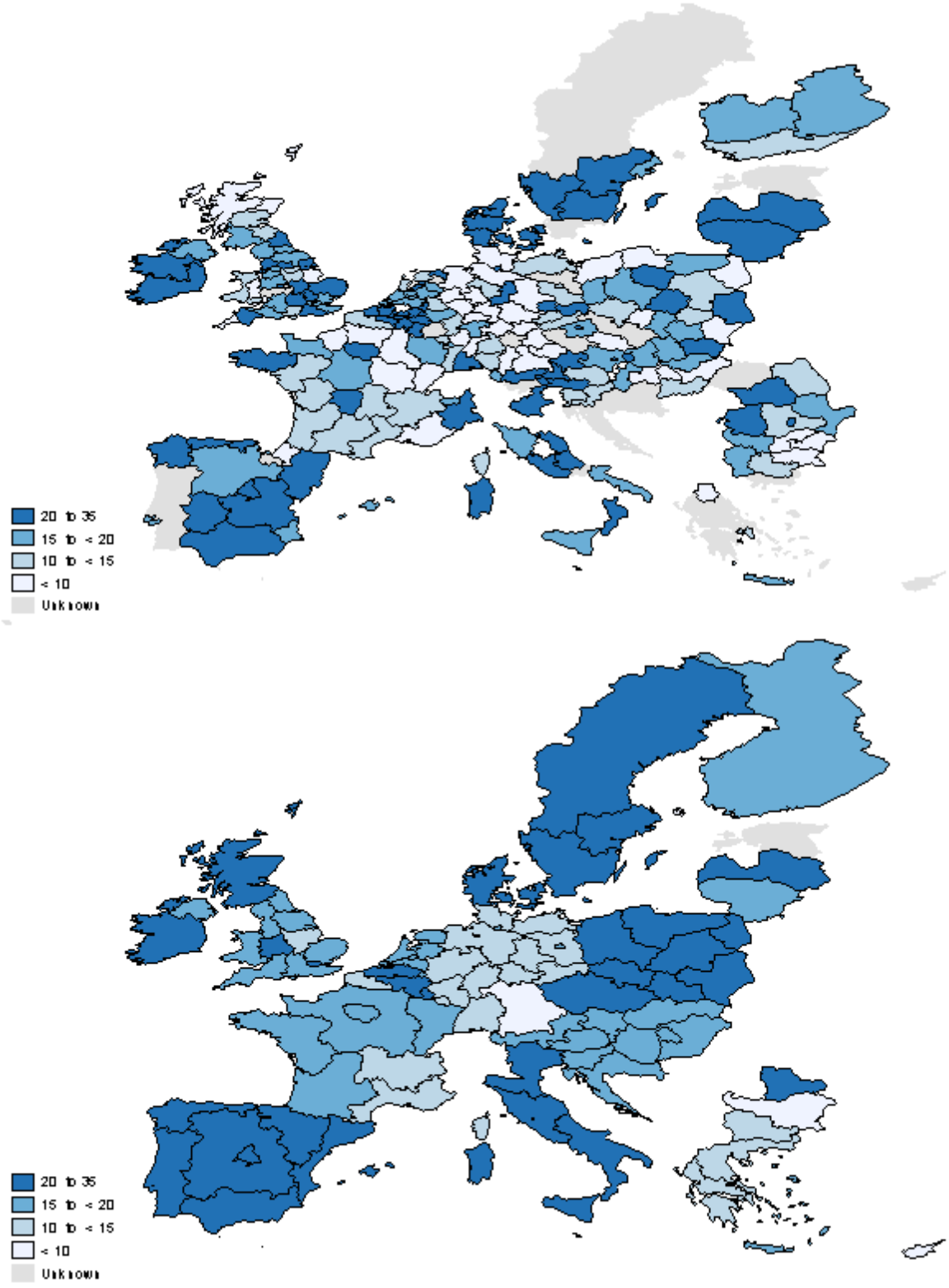
[39] NUTS 1 leve-information is available for 2,115,635 contract awards.

Figure 11: Direct cross-border share of the number of awards by contracting authority, at the 'Main site or location of work, place of delivery or of performance', at the NUTS 2 – top graph – and at the NUTS 1 – bottom graph – levels, between 2009 and 2015, EU28



Source: London Economics based on TED transactions and Orbis database.
Note: Darker shades of blue refer to a higher share of direct cross-border contracts in all awards by contracting authority, with the given NUTS region as the 'main location of work'. Areas in grey indicate that the sample of contract awards with that NUTS code was less than 50 and as a result they were not included in the analysis.

Figure 12: Indirect cross-border share of the number of awards by contracting authority, at the 'Main site or location of work, place of delivery or of performance', at the NUTS 2 – top graph – and at the NUTS 1 – bottom graph – levels, between 2009 and 2015, EU28



Source: London Economics based on TED transactions and Orbis database.
Note: Darker shades of blue refer to a higher share of indirect cross-border contracts in all awards by contracting authority, with the given NUTS region as the 'main location of work'. Areas in grey indicate that the sample of contract awards with that NUTS code was less than 50 and as a result they were not included in the analysis.

3.4.7. Level and structure of cross-border procurement, by country of contract winner

This sub-section examines cross-border procurement at the level of country of ownership of the successful bidder. It takes as a starting point the total number and value of contracts won by firms of a given Member State and then breaks these totals into direct and indirect cross-border contracts.

It should be noted that this section only covers indirect cross-border contracts by firms for which the country of ownership could be identified.[40] As a result, indirect cross-border levels in these tables slightly understate the overall level of indirect cross-border procurement.

As shown below, the direct cross-border shares in the number of awards ranged between 0.1% and 5.5% of all cross-border shares.

Eastern European firms from Latvia, Slovenia, Bulgaria, and Romania won very low levels of direct cross-border contracts in terms of both the number and values of awards. On the other end of the spectrum, owners in Austria, Malta, Ireland, Luxembourg, Belgium, the UK, Czech Republic, Denmark & the Netherlands had high shares of direct cross-border wins relative to the total number of awards won by firms from these countries.

The range in the values of indirect cross-border participation was much wider across countries, varying from 0.1% to 90.5%. The highest shares of indirect cross-border in terms of number of awards arise in firms with ownership from Luxembourg (90.5%) and Cyprus (85.1%). This is likely to be a reflection that in both these countries the number of domestic contract awards is relatively small, which translates into unusually high indirect cross-border procurement at the ownership level.

Eastern European firms also engaged in low levels of indirect cross-border procurement with low indirect cross-border shares in terms of both the number and value of awards in Bulgaria, Latvia, Poland, Slovenia, and Romania.

Table 29: Number and value of awards between 2009 and 2015 across EU28 and other European countries, by country of ownership of successful bidder

Country of contract winner	Total number of awards	Direct cross-border share in the number of awards	Indirect cross-border share in the number of awards	Total value of awards (EUR million)	Direct cross-border share in the value of awards	Indirect cross-border share in the value of awards
Austria	23,884	5.5%	46.5%	18,924	6.5%	50.5%
Belgium	30,814	3.1%	32.0%	12,101	4.0%	17.5%
Bulgaria	50,951	0.1%	1.8%	9,730	0.4%	1.2%
Croatia	10,623	0.7%	23.8%	2,606	6.1%	4.9%
Cyprus	18,487	0.4%	85.1%	4,607	2.4%	76.9%
Czech R.	33,158	2.9%	3.7%	16,735	4.0%	4.4%
Denmark	28,122	2.9%	33.4%	15,561	3.1%	16.5%
Estonia	13,400	2.3%	38.3%	6,083	2.2%	14.6%
Finland	19,304	2.7%	26.2%	11,657	2.9%	18.8%
France	407,122	0.4%	9.8%	125,510	1.0%	16.4%
Germany	234,084	1.8%	43.7%	72,536	3.6%	31.9%
Greece	6,848	2.2%	20.5%	4,343	1.7%	7.5%
Hungary	20,801	1.0%	15.3%	9,313	2.3%	8.3%

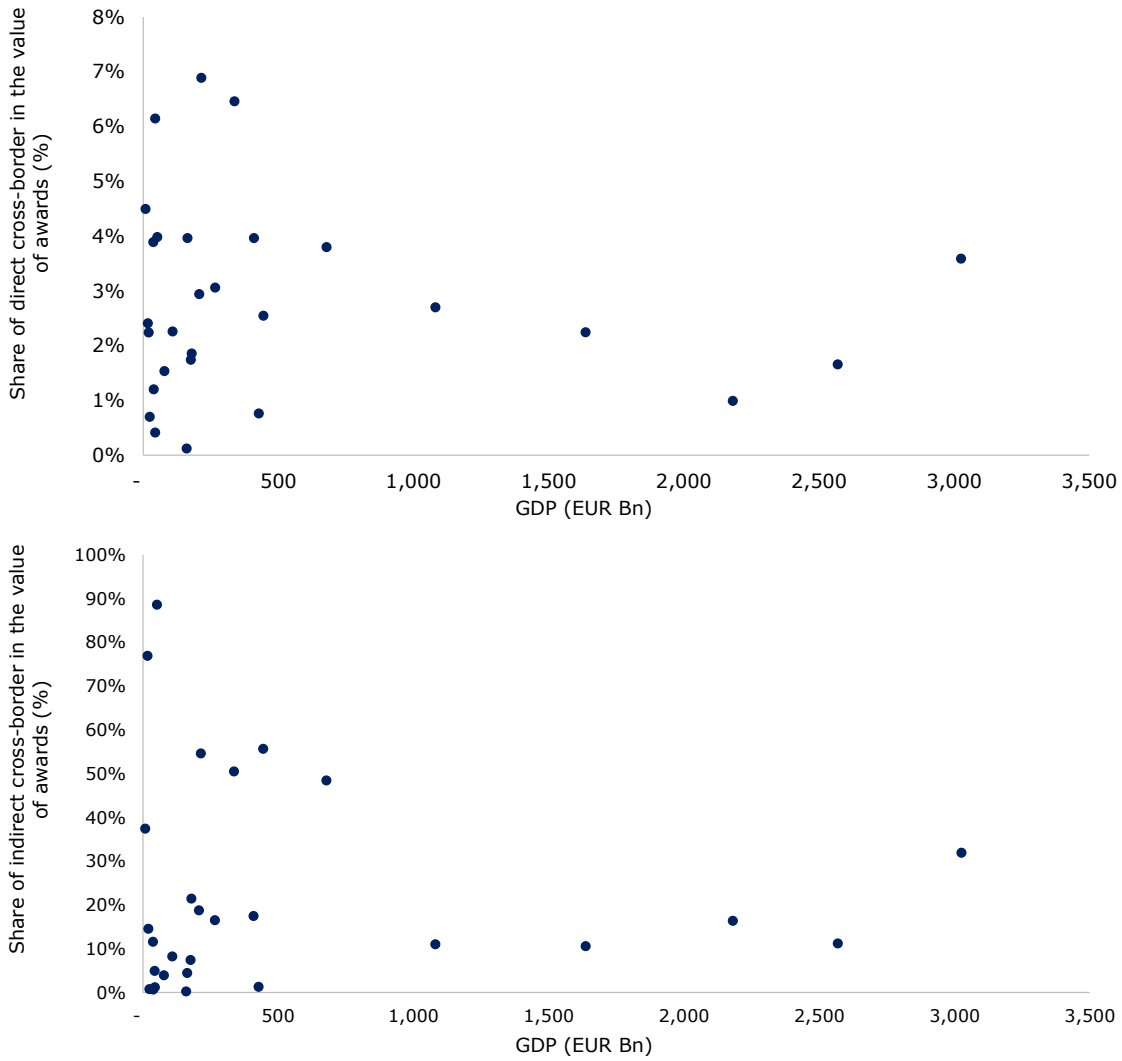
40 For instance, where a firm had two foreign owners from different countries then the firm was assigned as foreign but no country could be assigned.

Country of contract winner	Total number of awards	Direct cross-border share in the number of awards	Indirect cross-border share in the number of awards	Total value of awards (EUR million)	Direct cross-border share in the value of awards	Indirect cross-border share in the value of awards
Ireland	33,327	3.5%	68.3%	6,006	6.9%	54.6%
Italy	56,978	2.6%	18.5%	45,384	2.3%	10.6%
Latvia	34,931	0.5%	1.5%	18,593	0.7%	0.8%
Lithuania	25,633	1.5%	6.9%	4,034	3.9%	11.6%
Luxembourg	15,383	3.2%	90.5%	7,002	4.0%	88.6%
Malta	2,127	4.1%	42.0%	926	4.5%	37.4%
Netherlands	62,249	2.9%	53.1%	25,199	3.8%	48.4%
Poland	363,572	0.1%	2.5%	62,613	0.8%	1.3%
Portugal	8,665	1.5%	22.3%	5,806	1.9%	21.5%
Romania	62,224	0.1%	0.1%	19,731	0.1%	0.2%
Slovakia	14,103	1.5%	27.7%	7,614	1.5%	3.9%
Slovenia	32,599	0.4%	1.1%	5,363	1.2%	0.7%
Spain	51,934	1.3%	13.0%	46,438	2.7%	11.0%
Sweden	40,576	1.7%	39.3%	15,124	2.5%	55.7%
UK	164,738	3.0%	19.0%	76,383	1.7%	11.2%

Source: London Economics based on TED transactions and Orbis database.
Note: The total number and value of awards across countries are not comparable to Table 12 as country of ownership could not be exactly identified for all contract awards.

It is also interesting to note that there is no apparent relationship neither between a country's economic size and its participation in direct cross-border procurement nor between a country's economic size and its participation in indirect cross-border procurement, from the point of the country of ownership of the contract award winner.

Figure 13: Relationship between the share of direct and indirect cross-border in total value of awards and GDP, by country of ownership of successful bidder, EU28



Source: London Economics based on TED transactions and Orbis database; GDP data from Eurostat.
Note: Cross border shares are over the period 2009-2015; GDP data is latest available.

3.4.8. Bilateral analysis of cross-border procurement: contract winner perspective

This sub-section investigates what percentage of cross border wins by firms from each country were won from the different countries of contracting authorities between 2009 and 2015. Thus, Table 30 and Table 31 show, for direct cross-border contracts, country of contract winner in rows and country of awarding authorities in columns. Each cell represents the percentage of cross border awards that firms from the row country won from awarding authorities in the column country.[41]

For example, the tables highlight with darker shades of green the cells with higher values. Darker columns in Table 30 represent awarding authorities with relatively high numbers of direct cross border awards.

Table 32 and Table 33 are similar and show, for indirect cross-border contracts, country of ownership of contract winner in rows and country of awarding authorities in columns. Each cell

41 For instance, the (EL, CY) cell implies that 62% of all direct cross-border contracts won by Greek firms were won from Cypriot authorities.

represents the percentage of cross border awards that firms owned in the row country won from awarding authorities in the column country.

It is interesting to note that the expected strength of particular bilateral relations remains.

There are bigger differences between number and value of contract tables than in the previous set of tables. For example, French and Polish awarding authorities are a large fraction of the number of cross border awards to firms from many different countries, but their importance becomes considerably smaller when we look at value of contracts. This is at least partly explained by the fact that TED records a relatively large number of French and Polish contracts of relatively smaller value.

It is important not to interpret darker shades as necessarily corresponding to authorities that award more cross border contracts. Indeed, because the cells represent percentages of the wins by firms in the respective row country, some authorities may have darker shares simply because they are an important partner to relatively small countries.

Table 30: Distribution of direct cross-border procurement per country of contracting authority, in % of number of direct cross-border awards won by all firms in each EU28 country

Country of contract winner \ Country of contracting authority	AT	BE	BG	HR	CY	CZ	DK	EE	FI	FR	DE	EL	HU	IE	IT	LV	LT	LU	MT	NL	PL	PT	RO	SK	SI	ES	SE	UK
AT		1%	2%	1%	0%	3%	2%	1%	1%	7%	37%	0%	7%	1%	10%	1%	1%	1%	0%	1%	8%	0%	5%	5%	2%	1%	1%	3%
BE	1%		1%	0%	0%	1%	2%	1%	1%	45%	4%	0%	1%	1%	3%	1%	0%	4%	0%	12%	10%	0%	2%	1%	0%	3%	1%	6%
BG	2%	12%		0%	0%	8%	1%	1%	0%	24%	13%	6%	2%	0%	6%	3%	0%	0%	0%	3%	12%	0%	5%	1%	1%	0%	0%	2%
HR	8%	0%	1%		1%	1%	1%	0%	0%	6%	6%	7%	9%	0%	7%	7%	0%	0%	1%	0%	0%	0%	3%	29%	0%	8%	3%	0%
CY	1%	6%	1%	1%		1%	0%	0%	1%	2%	4%	23%	0%	0%	2%	0%	0%	0%	0%	1%	47%	0%	2%	3%	1%	1%	0%	5%
CZ	1%	1%	2%	0%	0%		1%	1%	1%	0%	7%	0%	4%	0%	1%	4%	4%	0%	0%	1%	33%	0%	2%	1%	35%	0%	0%	0%
DK	1%	1%	0%	0%	0%	0%		2%	7%	19%	10%	0%	0%	2%	5%	3%	2%	0%	0%	1%	2%	0%	0%	0%	0%	4%	33%	6%
EE	0%	1%	0%	0%	0%	0%	1%		10%	1%	5%	0%	0%	0%	0%	57%	17%	0%	0%	0%	1%	0%	0%	1%	0%	2%	3%	0%
FI	0%	1%	0%	0%	1%	0%	5%	16%		6%	6%	1%	1%	2%	2%	26%	3%	0%	0%	1%	4%	0%	1%	1%	0%	6%	12%	5%
FR	1%	18%	1%	0%	0%	2%	3%	1%	1%		7%	1%	1%	2%	23%	1%	1%	1%	0%	2%	9%	2%	2%	1%	0%	12%	2%	8%
DE	13%	5%	1%	0%	0%	3%	3%	1%	1%	20%		1%	2%	1%	2%	2%	1%	4%	0%	4%	16%	1%	3%	2%	1%	2%	3%	6%
EL	0%	1%	3%	0%	62%	0%	0%	0%	0%	3%	9%		0%	1%	3%	0%	0%	0%	1%	0%	1%	1%	5%	0%	0%	6%	0%	4%
HU	6%	0%	1%	1%	1%	2%	0%	0%	0%	5%	35%	0%		0%	2%	1%	0%	0%	0%	1%	3%	0%	17%	16%	4%	2%	1%	3%
IE	0%	1%	0%	0%	0%	0%	1%	0%	0%	10%	4%	0%	0%		3%	0%	0%	0%	0%	1%	21%	0%	0%	0%	0%	2%	1%	56%
IT	4%	3%	1%	1%	0%	1%	1%	0%	0%	37%	5%	2%	1%	1%		0%	1%	0%	2%	1%	13%	1%	12%	3%	1%	4%	1%	3%
LV	0%	0%	0%	0%	0%	0%	0%	23%	1%	1%	0%	0%	0%	0%	9%		60%	0%	0%	0%	2%	0%	0%	0%	0%	0%	0%	1%
LT	1%	0%	0%	0%	0%	25%	0%	7%	1%	0%	1%	0%	0%	0%	3%	52%		0%	0%	1%	8%	0%	0%	0%	0%	1%	0%	0%
LU	0%	20%	0%	0%	1%	1%	1%	0%	0%	40%	10%	0%	1%	0%	3%	1%	3%		1%	3%	3%	0%	5%	0%	0%	2%	1%	3%
MT	0%	0%	8%	0%	0%	0%	0%	0%	0%	0%	8%	4%	15%	0%	31%	0%	0%	0%		4%	8%	0%	0%	0%	0%	4%	0%	19%
NL	1%	23%	0%	0%	0%	1%	3%	2%	1%	18%	14%	1%	2%	1%	2%	1%	1%	1%	0%		8%	0%	2%	3%	0%	4%	2%	7%
PL	1%	1%	1%	0%	0%	12%	5%	3%	1%	21%	8%	1%	4%	0%	14%	7%	7%	0%	0%	0%		1%	3%	0%	2%	2%	2%	3%
PT	0%	3%	0%	0%	0%	1%	0%	0%	1%	22%	2%	1%	0%	2%	4%	0%	0%	0%	2%	1%	40%		4%	0%	0%	10%	0%	6%
RO	4%	1%	8%	0%	1%	1%	1%	0%	0%	8%	4%	3%	14%	1%	16%	1%	0%	0%	3%	0%	28%	2%		0%	0%	1%	3%	1%
SK	36%	1%	1%	12%	1%	0%	6%	1%	1%	1%	11%	1%	4%	1%	2%	2%	1%	0%	0%	2%	11%	1%	0%		2%	1%	4%	2%
SI	4%	0%	1%	1%	0%	58%	1%	1%	0%	1%	3%	0%	8%	0%	1%	0%	1%	0%	0%	0%	17%	0%	1%	2%		0%	1%	1%
ES	1%	5%	1%	0%	1%	0%	1%	1%	1%	26%	7%	1%	0%	2%	7%	1%	2%	0%	1%	3%	12%	14%	8%	1%	0%		1%	4%
SE	0%	1%	0%	0%	0%	0%	29%	2%	14%	27%	3%	0%	0%	0%	7%	2%	1%	0%	0%	1%	4%	1%	1%	0%	0%	1%		4%
UK	0%	2%	0%	0%	0%	1%	3%	1%	1%	11%	3%	0%	1%	27%	4%	1%	1%	0%	1%	2%	35%	0%	1%	1%	0%	2%	2%	
X-EU	1%	1%	1%	0%	0%	3%	3%	1%	2%	39%	7%	0%	1%	3%	4%	1%	1%	0%	0%	2%	7%	0%	2%	1%	0%	1%	2%	16%

Source: London Economics based on TED transactions and Orbis database.
Note: Country of winning bidder in rows and country of awarding authority in columns. Stronger green shades represent higher incidence of firms from the respective row country winning direct cross border contracts from contracting authorities in the respective column country. Rows in table do not sum to 100% due to rounding: there are several countries whose firms win less than 0.5% of their cross border contracts from authorities in particular countries; shares lower than 0.5% round to zero in the table. An "X-EU" column as in tables 23 to 26 is absent in this table because TED data does not record public procurement awards by non-EU authorities.

Table 31: Distribution of direct cross-border procurement per country of contracting authority, in % of value of direct cross-border awards won by all firms in each EU28 country

Country of contract winner \ Country of contracting authority	AT	BE	BG	HR	CY	CZ	DK	EE	FI	FR	DE	EL	HU	IE	IT	LV	LT	LU	MT	NL	PL	PT	RO	SK	SI	ES	SE	UK
AT		1%	2%	2%	0%	5%	0%	1%	1%	2%	29%	2%	7%	0%	10%	0%	1%	0%	0%	2%	7%	0%	15%	3%	2%	0%	0%	3%
BE	1%		2%	0%	0%	1%	3%	0%	2%	30%	5%	1%	1%	0%	6%	1%	1%	6%	1%	11%	6%	1%	6%	2%	0%	4%	0%	10%
BG	1%	7%		0%	0%	16%	0%	0%	0%	18%	4%	6%	5%	0%	7%	1%	0%	0%	0%	0%	0%	0%	30%	1%	2%	0%	0%	0%
HR	0%	0%	1%		6%	0%	0%	0%	0%	0%	6%	9%	11%	0%	31%	2%	0%	0%	0%	0%	1%	0%	8%	22%	0%	2%	0%	0%
CY	0%	12%	6%	4%		0%	0%	0%	0%	2%	0%	18%	0%	0%	0%	0%	0%	0%	0%	0%	32%	0%	9%	2%	8%	1%	0%	7%
CZ	2%	1%	9%	0%	0%		0%	3%	2%	0%	1%	0%	5%	0%	3%	1%	2%	0%	0%	0%	16%	0%	2%	3%	47%	0%	1%	0%
DK	1%	1%	0%	2%	1%	0%		1%	6%	11%	10%	0%	0%	0%	8%	10%	3%	0%	0%	3%	3%	0%	0%	0%	0%	14%	16%	9%
EE	0%	4%	2%	0%	0%	0%	5%		8%	0%	3%	0%	0%	0%	0%	59%	14%	0%	0%	0%	2%	0%	0%	0%	0%	1%	0%	0%
FI	1%	2%	1%	0%	3%	0%	4%	24%		5%	6%	5%	4%	0%	1%	14%	2%	0%	0%	1%	7%	0%	0%	1%	2%	4%	9%	4%
FR	2%	14%	1%	0%	0%	3%	3%	1%	4%		5%	2%	4%	0%	25%	1%	0%	1%	0%	1%	6%	1%	5%	3%	1%	11%	1%	7%
DE	12%	3%	3%	1%	1%	4%	3%	2%	2%	8%		1%	3%	0%	5%	3%	2%	4%	1%	3%	14%	1%	10%	2%	2%	2%	1%	6%
EL	0%	0%	3%	0%	50%	0%	0%	0%	0%	7%	3%		0%	0%	6%	0%	0%	0%	1%	0%	2%	5%	8%	0%	0%	4%	0%	11%
HU	2%	0%	0%	0%	0%	1%	0%	0%	0%	2%	8%	0%		0%	1%	0%	0%	0%	0%	0%	2%	0%	37%	30%	9%	0%	0%	6%
IE	0%	1%	0%	0%	0%	0%	0%	0%	0%	5%	4%	0%	0%		11%	0%	0%	0%	0%	1%	5%	2%	0%	0%	0%	3%	1%	65%
IT	3%	3%	2%	2%	0%	1%	1%	1%	0%	19%	2%	5%	3%	0%		2%	2%	0%	4%	1%	6%	0%	32%	1%	0%	5%	1%	3%
LV	0%	0%	0%	0%	0%	0%	0%	19%	0%	0%	1%	0%	2%	0%	3%		69%	0%	0%	0%	3%	0%	0%	0%	0%	0%	0%	3%
LT	2%	0%	0%	0%	0%	1%	0%	4%	0%	0%	0%	0%	0%	0%	3%	76%		0%	0%	1%	8%	0%	0%	0%	0%	1%	3%	0%
LU	0%	39%	1%	0%	1%	0%	0%	0%	0%	25%	9%	0%	1%	0%	4%	0%	2%		0%	3%	1%	0%	10%	0%	0%	0%	0%	3%
MT	0%	0%	7%	0%	0%	0%	0%	0%	0%	0%	0%	3%	5%	0%	58%	0%	0%	0%		0%	5%	0%	0%	0%	0%	0%	0%	22%
NL	2%	17%	1%	0%	0%	2%	6%	3%	3%	8%	8%	1%	4%	2%	3%	2%	1%	0%	0%		9%	0%	5%	2%	0%	7%	2%	12%
PL	0%	1%	5%	0%	0%	18%	4%	6%	1%	11%	5%	0%	8%	0%	10%	5%	8%	0%	0%	0%		0%	5%	0%	7%	1%	1%	3%
PT	0%	2%	0%	0%	0%	1%	0%	0%	0%	18%	1%	5%	0%	0%	8%	0%	0%	0%	4%	0%	25%		13%	0%	1%	11%	0%	11%
RO	0%	0%	12%	0%	8%	1%	0%	0%	0%	1%	0%	4%	2%	0%	27%	0%	0%	0%	1%	0%	40%	1%		0%	0%	1%	0%	0%
SK	6%	0%	1%	10%	2%	0%	11%	1%	1%	0%	7%	0%	28%	0%	0%	1%	0%	0%	0%	0%	28%	1%	0%		1%	0%	0%	0%
SI	6%	0%	0%	1%	0%	66%	1%	0%	0%	4%	1%	0%	4%	0%	1%	0%	0%	0%	0%	0%	15%	0%	0%	1%		0%	0%	0%
ES	1%	2%	2%	1%	1%	0%	3%	0%	1%	11%	2%	1%	0%	0%	9%	0%	3%	0%	0%	1%	15%	21%	23%	1%	0%		1%	2%
SE	0%	1%	0%	0%	0%	0%	52%	2%	14%	9%	1%	0%	0%	0%	5%	3%	1%	0%	0%	0%	3%	0%	1%	1%	0%	1%		4%
UK	1%	2%	1%	0%	1%	2%	5%	2%	2%	11%	3%	1%	0%	19%	20%	1%	2%	0%	1%	3%	9%	0%	6%	1%	1%	3%	2%	
X-EU	1%	2%	1%	1%	1%	2%	4%	1%	2%	22%	5%	1%	2%	1%	7%	3%	1%	0%	1%	1%	5%	1%	5%	2%	1%	1%	2%	26%

Source: London Economics based on TED transactions and Orbis database.
Note: Country of winning bidder in rows and country of awarding authority in columns. Stronger green shades represent higher incidence of firms from the respective row country winning direct cross border contracts from contracting authorities in the respective column country. Rows in table do not sum to 100% due to rounding: there are several countries whose firms win less than 0.5% of their cross border contracts from authorities in particular countries; shares lower than 0.5% round to zero in the table. An ”X-EU” column as in tables 23 to 26 is absent in this table because TED data does not record public procurement awards by non-EU authorities.

Table 32: Distribution of indirect cross-border procurement per country of contracting authority, in % of number of indirect cross-border awards won by all firms with ownership in each EU28 country

Country of owner of contract winner	Country of contracting authority																											
	AT	BE	BG	HR	CY	CZ	DK	EE	FI	FR	DE	EL	HU	IE	IT	LV	LT	LU	MT	NL	PL	PT	RO	SK	SI	ES	SE	UK
AT		1%	3%	1%	0%	15%	0%	0%	0%	4%	29%	0%	8%	0%	0%	0%	0%	0%	0%	2%	16%	0%	10%	4%	4%	1%	0%	1%
BE	0%		1%	0%	0%	2%	0%	0%	0%	72%	4%	1%	1%	0%	2%	0%	0%	1%	0%	3%	5%	0%	1%	0%	0%	3%	1%	3%
BG	0%	0%		0%	0%	0%	0%	0%	0%	0%	1%	0%	0%	0%	0%	93%	0%	0%	0%	0%	0%	0%	5%	0%	0%	0%	0%	0%
HR	0%	0%	0%		0%	0%	0%	0%	0%	0%	0%	0%	0%	0%	0%	0%	0%	0%	0%	0%	0%	0%	0%	99%	0%	0%	0%	0%
CY	0%	0%	4%	0%		3%	0%	0%	0%	0%	0%	1%	0%	0%	0%	1%	8%	0%	0%	0%	3%	0%	77%	1%	0%	0%	0%	0%
CZ	0%	0%	11%	0%	0%		0%	0%	0%	0%	3%	0%	3%	0%	0%	1%	0%	0%	0%	0%	11%	0%	2%	0%	68%	0%	0%	0%
DK	1%	2%	0%	0%	0%	1%		1%	7%	32%	4%	0%	0%	1%	6%	0%	1%	0%	0%	1%	8%	0%	1%	1%	0%	7%	20%	5%
EE	0%	0%	0%	0%	0%	0%	0%		0%	0%	0%	0%	0%	0%	0%	93%	6%	0%	0%	0%	0%	0%	0%	0%	0%	0%	0%	0%
FI	3%	2%	0%	0%	0%	1%	7%	12%		4%	11%	0%	1%	0%	1%	19%	9%	0%	0%	1%	6%	0%	0%	0%	0%	3%	17%	4%
FR	1%	8%	0%	0%	0%	2%	1%	0%	1%		9%	0%	2%	1%	8%	0%	0%	0%	0%	3%	42%	1%	1%	1%	1%	8%	2%	8%
DE	1%	1%	3%	1%	0%	2%	1%	0%	0%	17%		0%	2%	0%	4%	4%	0%	0%	0%	1%	45%	0%	6%	0%	1%	4%	1%	4%
EL	0%	0%	9%	0%	5%	0%	0%	0%	0%	4%	1%		0%	0%	23%	0%	0%	0%	0%	0%	1%	0%	55%	0%	0%	0%	0%	0%
HU	3%	0%	1%	3%	0%	2%	0%	0%	0%	0%	1%	0%		0%	0%	0%	0%	0%	0%	0%	3%	0%	83%	0%	3%	0%	0%	0%
IE	0%	1%	0%	0%	0%	0%	1%	0%	1%	25%	2%	0%	0%		8%	0%	0%	0%	0%	0%	34%	1%	11%	0%	0%	6%	1%	8%
IT	1%	3%	2%	2%	0%	2%	0%	0%	0%	27%	8%	1%	3%	0%		0%	0%	0%	0%	1%	20%	0%	9%	3%	0%	12%	0%	5%
LV	0%	0%	0%	0%	0%	0%	0%	15%	0%	0%	1%	0%	0%	0%	0%		84%	0%	0%	0%	0%	0%	0%	0%	0%	0%	0%	0%
LT	0%	0%	0%	0%	0%	0%	0%	7%	0%	0%	0%	0%	0%	0%	0%	87%		0%	0%	0%	1%	0%	0%	0%	0%	4%	0%	0%
LU	1%	4%	0%	0%	0%	3%	0%	0%	0%	61%	4%	0%	0%	1%	5%	0%	0%		0%	3%	8%	1%	1%	0%	0%	2%	1%	6%
MT	0%	0%	1%	0%	0%	2%	0%	0%	0%	1%	2%	0%	3%	1%	3%	7%	0%	0%		2%	56%	1%	3%	0%	0%	1%	0%	15%
NL	0%	6%	1%	0%	0%	2%	0%	0%	0%	22%	10%	0%	1%	0%	6%	0%	0%	0%	0%		35%	0%	2%	1%	0%	5%	2%	6%
PL	0%	0%	2%	0%	0%	2%	0%	0%	0%	0%	1%	0%	0%	0%	1%	3%	86%	0%	0%	0%		0%	4%	0%	1%	0%	0%	0%
PT	0%	0%	0%	0%	0%	0%	0%	0%	0%	43%	10%	0%	0%	0%	0%	0%	0%	0%	0%	0%	11%		3%	0%	0%	32%	0%	0%
RO	0%	0%	3%	0%	0%	6%	0%	0%	0%	34%	42%	0%	4%	0%	10%	0%	0%	0%	0%	0%	0%	0%		0%	0%	0%	0%	0%
SK	1%	0%	0%	16%	0%	1%	0%	0%	0%	1%	78%	0%	0%	0%	0%	0%	0%	0%	0%	0%	2%	0%	0%		1%	0%	0%	0%
SI	1%	0%	0%	0%	0%	11%	0%	0%	0%	0%	0%	0%	2%	0%	0%	0%	0%	0%	0%	0%	86%	0%	0%	0%		0%	0%	0%
ES	3%	1%	1%	0%	0%	3%	0%	0%	0%	26%	5%	0%	1%	0%	4%	0%	0%	0%	0%	0%	35%	7%	4%	0%	0%		0%	10%
SE	0%	3%	0%	0%	0%	2%	8%	3%	10%	14%	5%	0%	2%	0%	3%	7%	11%	0%	0%	3%	18%	0%	0%	1%	0%	4%		5%
UK	1%	2%	0%	0%	0%	1%	3%	0%	1%	23%	4%	0%	1%	4%	5%	1%	1%	0%	0%	3%	32%	1%	8%	0%	0%	6%	3%	
X-EU	0%	1%	0%	0%	0%	1%	1%	0%	1%	24%	6%	0%	1%	0%	7%	1%	4%	0%	0%	1%	25%	1%	7%	2%	0%	6%	2%	8%

Source: London Economics based on TED transactions and Orbis database.
Note: Country of winning bidder in rows and country of awarding authority in columns. Stronger green shades represent higher incidence of firms from the respective row country winning indirect cross border contracts from contracting authorities in the respective column country. Rows in table do not sum to 100% due to rounding: there are several countries whose firms win less than 0.5% of their cross border contracts from authorities in particular countries; shares lower than 0.5% round to zero in the table. An ”X-EU” column as in tables 23 to 26 is absent in this table because TED data does not record public procurement awards by non-EU authorities.

Table 33: Distribution of indirect cross-border procurement per country of contracting authority, in % of value of indirect cross-border awards won by all firms with ownership in each EU28 country

Country of owner of contract winner	Country of contracting authority																											
	AT	BE	BG	HR	CY	CZ	DK	EE	FI	FR	DE	EL	HU	IE	IT	LV	LT	LU	MT	NL	PL	PT	RO	SK	SI	ES	SE	UK
AT		1%	1%	1%	0%	14%	1%	0%	0%	1%	25%	0%	10%	0%	0%	0%	0%	0%	0%	1%	18%	0%	13%	2%	7%	1%	0%	1%
BE	0%		1%	0%	0%	7%	0%	0%	0%	44%	5%	6%	2%	0%	3%	0%	0%	2%	0%	7%	3%	0%	1%	0%	0%	7%	0%	12%
BG	0%	0%		0%	0%	0%	0%	0%	0%	0%	1%	0%	0%	0%	0%	76%	0%	0%	0%	0%	0%	6%	17%	0%	0%	0%	0%	0%
HR	0%	0%	1%		0%	0%	0%	0%	0%	0%	0%	0%	0%	0%	0%	0%	0%	0%	0%	0%	1%	0%	0%	99%	0%	0%	0%	0%
CY	0%	0%	5%	0%		22%	0%	0%	0%	0%	0%	3%	1%	0%	1%	3%	0%	0%	0%	0%	10%	0%	51%	0%	2%	0%	1%	0%
CZ	0%	0%	14%	0%	0%		0%	0%	0%	0%	2%	0%	0%	0%	0%	3%	0%	0%	0%	0%	5%	0%	4%	0%	71%	0%	0%	0%
DK	6%	2%	0%	0%	0%	3%		2%	10%	10%	4%	1%	1%	1%	1%	0%	1%	0%	0%	2%	9%	2%	2%	1%	4%	17%	9%	13%
EE	0%	0%	0%	0%	0%	0%	0%		6%	0%	0%	0%	0%	0%	0%	82%	12%	0%	0%	0%	0%	0%	0%	0%	0%	0%	0%	0%
FI	3%	1%	0%	0%	0%	4%	5%	16%		1%	15%	0%	0%	0%	4%	13%	8%	0%	0%	0%	8%	1%	0%	0%	0%	5%	10%	5%
FR	1%	11%	0%	0%	0%	5%	1%	0%	1%		7%	0%	3%	0%	17%	0%	0%	0%	0%	2%	14%	1%	3%	0%	2%	12%	1%	15%
DE	3%	2%	2%	1%	0%	6%	2%	1%	1%	9%		0%	7%	0%	10%	2%	0%	0%	0%	2%	24%	1%	5%	1%	3%	9%	1%	10%
EL	0%	0%	7%	0%	15%	0%	0%	0%	0%	2%	5%		0%	0%	18%	0%	0%	0%	0%	0%	1%	0%	50%	0%	0%	0%	0%	1%
HU	8%	0%	3%	22%	0%	10%	0%	0%	0%	0%	0%	0%		0%	1%	0%	0%	0%	0%	0%	7%	0%	24%	0%	25%	0%	0%	0%
IE	1%	1%	0%	0%	0%	0%	0%	0%	2%	14%	1%	0%	1%		16%	0%	0%	0%	0%	1%	9%	1%	8%	0%	0%	12%	0%	32%
IT	2%	4%	1%	3%	0%	3%	0%	0%	1%	10%	5%	0%	5%	0%		0%	0%	0%	1%	0%	18%	0%	5%	3%	1%	28%	0%	9%
LV	0%	0%	0%	0%	0%	0%	0%	62%	0%	0%	0%	0%	0%	0%	0%		37%	0%	0%	0%	0%	0%	0%	0%	0%	0%	0%	0%
LT	0%	0%	0%	0%	0%	0%	0%	5%	0%	0%	0%	0%	0%	0%	0%	70%		0%	0%	0%	6%	0%	0%	0%	0%	18%	0%	0%
LU	0%	5%	2%	0%	0%	4%	0%	1%	0%	39%	3%	0%	1%	0%	9%	0%	0%		0%	2%	15%	1%	2%	0%	0%	7%	0%	9%
MT	0%	0%	1%	0%	0%	4%	0%	0%	0%	0%	15%	0%	0%	2%	7%	23%	0%	0%		2%	6%	3%	1%	0%	0%	0%	0%	35%
NL	1%	15%	1%	0%	0%	4%	0%	0%	1%	12%	15%	0%	1%	1%	8%	0%	0%	0%	0%		8%	1%	3%	0%	0%	10%	1%	16%
PL	0%	0%	1%	0%	0%	26%	1%	4%	0%	0%	4%	0%	0%	0%	1%	14%	35%	0%	0%	0%		0%	4%	0%	7%	1%	0%	1%
PT	0%	0%	0%	0%	0%	0%	0%	0%	0%	16%	2%	0%	0%	1%	1%	0%	0%	0%	0%	0%	24%		1%	0%	0%	54%	0%	1%
RO	0%	0%	0%	0%	0%	2%	0%	0%	0%	55%	15%	0%	2%	0%	26%	0%	0%	0%	0%	0%	0%	0%		0%	0%	0%	0%	0%
SK	1%	0%	0%	60%	0%	33%	0%	0%	0%	1%	3%	0%	0%	0%	0%	0%	0%	0%	0%	0%	0%	0%	0%		2%	0%	0%	0%
SI	2%	0%	0%	0%	0%	63%	0%	1%	0%	0%	0%	0%	8%	0%	0%	0%	0%	0%	0%	0%	19%	0%	6%	0%		0%	0%	0%
ES	4%	1%	1%	0%	0%	6%	0%	0%	0%	5%	7%	0%	1%	0%	4%	1%	0%	0%	0%	0%	47%	8%	1%	0%	0%		0%	15%
SE	0%	1%	0%	0%	0%	4%	9%	3%	26%	4%	3%	0%	1%	0%	4%	4%	3%	0%	0%	1%	26%	0%	0%	0%	1%	4%		5%
UK	2%	2%	1%	0%	0%	3%	5%	0%	4%	18%	7%	0%	2%	3%	14%	1%	1%	0%	0%	3%	13%	1%	3%	0%	1%	15%	2%	
X-EU	1%	1%	1%	0%	0%	2%	3%	0%	2%	13%	6%	0%	1%	0%	13%	2%	1%	0%	0%	2%	10%	1%	4%	1%	1%	12%	2%	18%

Source: London Economics based on TED transactions and Orbis database.
Note: Country of winning bidder in rows and country of awarding authority in columns. Stronger green shades represent higher incidence of firms from the respective row country winning indirect cross border contracts from contracting authorities in the respective column country. Rows in table do not sum to 100% due to rounding: there are several countries whose firms win less than 0.5% of their cross border contracts from authorities in particular countries; shares lower than 0.5% round to zero in the table. An "X-EU" column as in tables 23 to 26 is absent in this table because TED data does not record public procurement awards by non-EU authorities.

3.5. Sector level by CPV nomenclature

Table 34 below gives a breakdown of indirect and direct procurement shares by high-level (2-digit) common procurement vocabulary (CPV) sectors.

It illustrates the heterogeneity of direct and indirect cross-border shares both in the total number and value of awards at the sector level.

Indeed, the share of direct cross-border in the total number of awards varies from 0.3% in the 'health and social work services' sector and in the 'agricultural, forestry, horticultural, aquacultural and apicultural services' sector to 14.2% in 'services related to the oil and gas industry'.

The share of direct cross-border in the total value of awards equally had a similar range of between 0.2% in the `hotel, restaurant and retail trade services' and 'agricultural, forestry, horticultural, aquacultural and apicultural services' sectors and 15.6% in the 'security, fire-fighting, police and defence equipment' sector. The share of indirect cross-border awards in the total number of awards was even more varied across sectors ranging from 3.2% in 'agricultural, forestry, horticultural, aquacultural and apicultural services' sector to 38.7% in the 'medical equipment, pharmaceuticals and personal care products' sector. The share of the value of indirect cross-border awards were also widely spread between from 5.8% in the 'education and training services' sector to 49.4% in the 'medical equipment, pharmaceuticals and personal care products' sector.

Table 34: Indirect and direct cross-border shares in the total number and total value of awards between 2009 and 2015, EU28

Sector	Total number of awards	Direct cross-border share of total number of awards	Indirect cross-border share of total number of awards	Total value of awards (EUR million)	Direct cross-border share of total value of awards	Indirect cross-border share of total value of awards
Agricultural, farming, fishing, forestry and related products	13,089	2.4%	8.8%	2,262	2.9%	14.6%
Petroleum products, fuel, electricity and other sources of energy	56,832	0.8%	21.3%	40,094	1.7%	28.1%
Mining, basic metals and related products	7,041	2.0%	16.9%	2,519	5.2%	24.0%
Food, beverages, tobacco and related products	118,512	0.9%	15.0%	13,193	1.2%	16.6%
Agricultural machinery	4,635	1.8%	12.0%	528	5.2%	22.4%
Clothing, footwear, luggage articles and accessories	21,762	3.0%	12.5%	4,054	6.9%	9.3%
Leather and textile fabrics, plastic and rubber materials	5,378	2.5%	18.6%	886	13.5%	16.4%
Printed matter and related products	22,390	4.1%	8.5%	4,239	10.4%	13.3%
Office and computing machinery, equipment and supplies except furniture and software packages	73,592	0.9%	20.9%	19,992	1.8%	29.4%

Sector	Total number of awards	Direct cross-border share of total number of awards	Indirect cross-border share of total number of awards	Total value of awards (EUR million)	Direct cross-border share of total value of awards	Indirect cross-border share of total value of awards
Electrical machinery, apparatus, equipment and consumables; lighting	27,923	6.8%	20.8%	12,895	13.6%	28.1%
Radio, television, communication, telecommunication and related equipment	21,766	3.1%	18.4%	11,001	4.6%	22.0%
Medical equipment, pharmaceuticals and personal care products	978,231	1.3%	38.7%	90,193	2.6%	49.4%
Transport equipment and auxiliary products to transportation	96,338	3.8%	20.5%	35,044	9.4%	27.0%
Security, fire-fighting, police and defence equipment	13,935	6.7%	14.3%	5,745	15.6%	16.6%
Musical instruments, sport goods, games, toys, handicraft, art materials and accessories	6,723	2.5%	12.2%	768	8.4%	17.0%
Laboratory, optical and precision equipments (excl. glasses)	54,455	8.0%	31.1%	10,183	13.9%	34.8%
Furniture (incl. office furniture), furnishings, domestic appliances (excl. lighting) and cleaning products	64,837	2.0%	13.4%	9,321	4.3%	14.1%
Collected and purified water	839	1.2%	15.8%	622	0.6%	15.0%
Industrial machinery	27,228	7.5%	20.1%	10,042	14.7%	22.0%
Machinery for mining, quarrying, construction equipment	10,001	3.0%	15.0%	3,911	5.4%	19.6%
Construction structures and materials; auxiliary products to construction (except electric apparatus)	47,059	2.3%	15.7%	17,239	5.6%	22.8%
Construction work	315,360	1.0%	7.6%	303,500	1.7%	12.3%
Software package and information systems	22,582	4.6%	23.2%	12,971	5.2%	29.8%
Repair and maintenance services	95,319	1.8%	17.6%	41,031	2.7%	18.0%
Installation services (except software)	3,158	3.5%	17.8%	1,635	4.2%	27.3%
Hotel, restaurant and retail trade services	22,133	1.2%	12.8%	11,120	0.2%	23.3%
Transport services (excl. Waste transport)	105,870	0.8%	5.1%	33,770	1.1%	11.5%
Supporting and auxiliary transport services; travel agencies services	8,554	1.6%	11.2%	4,972	3.5%	21.7%
Postal and telecommunications services	25,306	1.1%	23.4%	8,806	1.2%	23.7%

Sector	Total number of awards	Direct cross-border share of total number of awards	Indirect cross-border share of total number of awards	Total value of awards (EUR million)	Direct cross-border share of total value of awards	Indirect cross-border share of total value of awards
Public utilities	7,771	0.8%	15.2%	7,175	0.5%	19.6%
Financial and insurance services	71,941	1.8%	23.2%	27,975	2.9%	31.6%
Real estate services	7,522	1.2%	10.2%	3,095	1.0%	13.2%
Architectural, construction, engineering and inspection services	131,725	1.7%	11.2%	38,758	3.9%	13.7%
IT services: consulting, software development, Internet and support	53,253	3.2%	24.0%	33,022	3.5%	30.8%
Research and development services and related consultancy services	9,516	5.6%	11.7%	3,574	8.9%	20.5%
Administration, defence and social security services	7,408	3.0%	10.9%	3,776	7.0%	13.1%
Services related to the oil and gas industry	1,694	14.2%	19.8%	2,556	10.9%	25.2%
Agricultural, forestry, horticultural, aquacultural and apicultural services	79,687	0.3%	3.2%	17,691	0.2%	6.5%
Business services: law, marketing, consulting, recruitment, printing and security	105,683	2.1%	10.7%	30,225	2.4%	17.0%
Education and training services	82,255	0.5%	4.0%	17,977	1.0%	5.8%
Health and social work services	68,815	0.3%	9.5%	34,346	0.3%	11.0%
Sewage, refuse, cleaning and environmental services	133,799	0.6%	9.6%	57,227	0.8%	13.0%
Recreational, cultural and sporting services	11,549	3.3%	4.9%	3,690	3.9%	7.5%
Other community, social and personal services	13,643	1.5%	10.1%	6,306	2.5%	13.0%

Source: London Economics based on TED transactions and Orbis database.
Note: Stronger green shading represents a high value of cross-border penetrative relative to average values in the respective column. The total number and value of awards across sectors are not comparable to Table 12 as sector could not be identified for all contract awards.

The highest levels of direct cross-border procurement in the number and value of awards were generally experienced in sectors related to machinery and specialist equipment as shown by Table 35.

On the other end of the spectrum, the lowest shares of direct cross-border procurement in the number and value of awards occurred in contract awards in the service sector. This is unsurprising as in the service sectors, such as education and healthcare, there are substantial constraints such as geographical proximity and language on firms bidding for contracts directly cross-border.

There was also a low share of direct cross-border procurement in the 'petroleum products, fuel, electricity and other sources of energy' sector. This may seem surprising as these are goods which are often imported. However, this counterintuitive result can be explained by the high share of indirect cross-border in this sector at 21.3% and 28.1% of the total number and value

of awards respectively. The explanation of the low share of direct cross-border procurement in 'public utilities' might be to some extent similar, as the shares of indirect cross-border 'public utilities' procurement is also relatively large (15.2% in number and 19.6% in value of awards).

Table 35: Top and bottom five sectors for direct cross-border shares in the total number and value of awards between 2009 and 2015, EU28

Top 5 sectors for direct cross-border procurement	
In the total number of awards	**In the total value of awards**
Services related to the oil and gas industry	Security, fire-fighting, police and defence equipment
Laboratory, optical and precision equipments (excl. glasses)	Industrial machinery
Industrial machinery	Laboratory, optical and precision equipments (excl. glasses)
Electrical machinery, apparatus, equipment and consumables; lighting	Electrical machinery, apparatus, equipment and consumables; lighting
Security, fire-fighting, police and defence equipment	Leather and textile fabrics, plastic and rubber materials
Bottom 5 sectors for direct cross-border procurement	
In the total number of awards	**In the total value of awards**
Agricultural, forestry, horticultural, aquacultural and apicultural services	Agricultural, forestry, horticultural, aquacultural and apicultural services
Health and social work services	Hotel, restaurant and retail trade services
Education and training services	Health and social work services
Sewage, refuse, cleaning and environmental services	Public utilities
Petroleum products, fuel, electricity and other sources of energy	Collected and purified water

Source: London Economics based on TED transactions and Orbis database.

As shown by Table 36, the highest shares of indirect cross-border in both the number and value of awards seem to arise in sectors covering highly specialised materials i.e. 'medical equipment, pharmaceuticals and personal care products', 'chemical products', and 'laboratory, optical and precision equipments (excl. glasses)' sectors. Indirect cross-border procurement is also high for services in 'IT services' and 'postal & telecommunications services'. This may be because IT software and telecommunications services are dominated by multinationals either benefitting from specialised technical knowledge or large economies of scale. The lowest shares in indirect cross-border procurement occur, in terms of both number and value of awards, mostly in service sectors as with the lowest direct cross-border shares. Indeed, the bottom three sectors in terms of indirect cross-border shares in both number and value of awards were 'education and training services' services', 'agricultural, forestry, horticultural, aquacultural and apicultural services' and 'recreational, cultural and sporting services'.

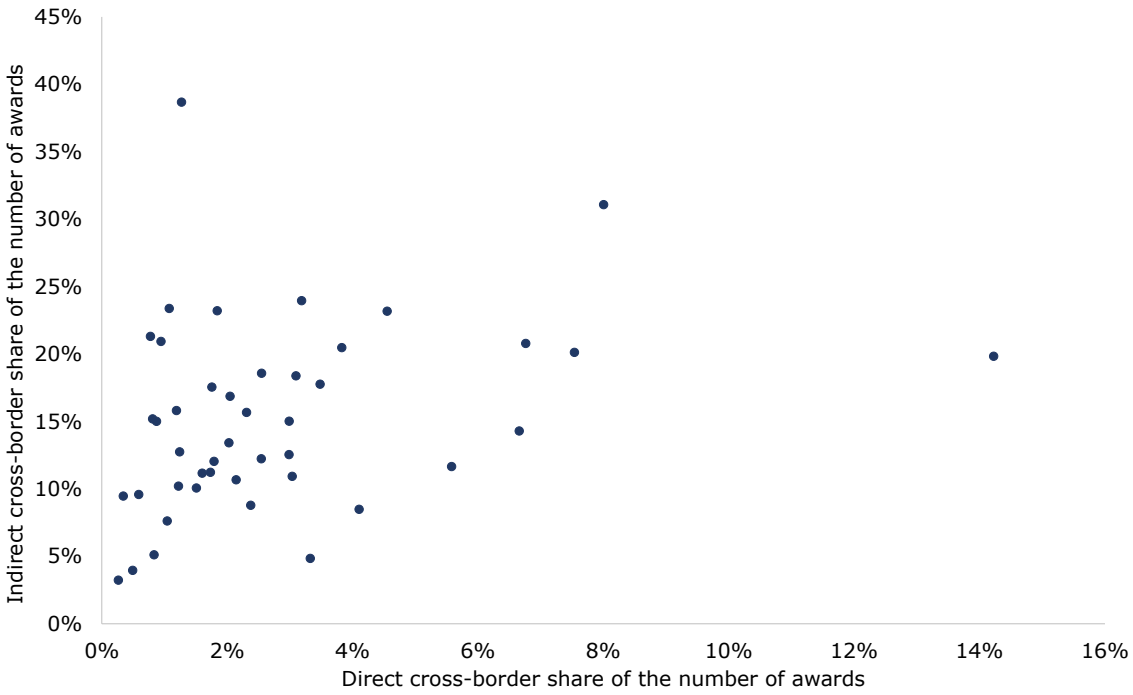
Table 36: Top and bottom five sectors for indirect cross-border shares in the total number and value of awards between 2009 and 2015, EU28

Top 5 sectors for indirect cross-border procurement	
In the total number of awards	**In the total value of awards**
Medical equipments, pharmaceuticals and personal care products	Medical equipments, pharmaceuticals and personal care products
Chemical products	Laboratory, optical and precision equipments (excl. glasses)
Laboratory, optical and precision equipments (excl. glasses)	Financial and insurance services
IT services: consulting, software development, Internet and support	IT services: consulting, software development, Internet and support
Postal and telecommunications services	Software package and information systems
Bottom 5 sectors for indirect cross-border procurement	
In the total number of awards	**In the total value of awards**
Agricultural, forestry, horticultural, aquacultural and apicultural services	Education and training services
Education and training services	Agricultural, forestry, horticultural, aquacultural and apicultural services
Recreational, cultural and sporting services	Recreational, cultural and sporting services
Transport services (excl. Waste transport)	Clothing, footwear, luggage articles and accessories
Construction work	Health and social work services

Source: London Economics based on TED transactions and Orbis database.

As shown by Figure 14, there is no observable relationship between the shares of direct and indirect cross-border in total number of awards at the sector level.

Figure 14: Relationship between the shares of direct and indirect cross-border in total number of awards, at the sector level, EU28



Source: London Economics based on TED transactions and Orbis database.
Note: Cross border shares are over the period 2009-2015.

3.6. Type of contract (Work, Supplies & Services)

Supplies represented the higher share of direct cross-border at 2.0% of the number of awards while the share of direct cross-border was lower at 1.1% and 1.3% in the works and services sectors respectively.

There appears, however, to be more variability across types of contract in terms of indirect cross-border shares. While the indirect cross-border share in the number of awards is 7.9% and 11.6% in the works and services sectors respectively, the indirect cross-border share for supplies contracts is considerably higher at 30.6% of the number of awards.

Similar patterns can also be observed considering the shares of direct and indirect cross-border contracts in the value of awards by type of contract.

A further analysis of cross-border penetration by contract type can be found in Table 74, Table 75 and Table 76 in annex 6.7.

Table 37: Direct and indirect cross-border procurement by type of contract between 2009 and 2015, EU28

Type of contract	Total number of awards	Direct cross-border share in number of awards	Indirect cross-border share in number of awards	Total value of awards (EUR million)	Direct cross-border share in value of awards	Indirect cross-border share in value of awards
Services	1,068,523	1.3%	11.6%	393,298	2.1%	17.0%
Supplies	1,691,334	2.0%	30.6%	297,793	5.3%	32.7%

Type of contract	Total number of awards	Direct cross-border share in number of awards	Indirect cross-border share in number of awards	Total value of awards (EUR million)	Direct cross-border share in value of awards	Indirect cross-border share in value of awards
Works	324,239	1.1%	7.9%	315,276	1.9%	12.4%

Source: London Economics based on TED transactions and Orbis database.

3.7. Type of contracting authority

The lowest share of direct cross-border procurement in terms of both the number and value of awards arose in local authorities and regional or local agencies: only 0.9% and 1.1% of the number of awards were direct cross-border, respectively. This indicates that procurement is least often **direct cross-border at the local and regional level**.

Excluding EU institutions[42], the highest shares of direct cross-border are found in contracts issued by the water, energy, transport and telecommunications sectors, at 5.5% of the value of all awards and 4.3% of the number of all awards.

As to the share of indirect cross-border purchases, the highest share in the number and value of awards occurred in bodies' governed by public law (27.4% & 23.3% respectively) and the lowest in local authorities (15.3% & 16.9% respectively).

Table 38: Direct and indirect cross-border procurement by contracting authority between 2009 and 2015, EU28

Contracting authority	Total number of awards	Direct cross-border share of number of awards	Indirect cross-border share of number of awards	Total value of awards (EUR million)	Direct cross-border share of value of awards	Indirect cross-border share of value of awards
Body governed by public law	940,599	1.7%	27.4%	204,113	2.8%	23.3%
Local authorities	703,706	0.9%	15.3%	256,501	1.2%	16.9%
Central government	262,644	2.4%	20.2%	114,635	4.9%	21.9%
Water, energy, transport and telecommunications sectors	174,961	4.3%	18.0%	156,261	5.5%	23.3%
Regional or local Agency / Office	61,650	1.1%	20.7%	27,974	0.9%	21.3%
National or federal Agency / Office	51,655	2.6%	23.3%	26,348	2.8%	19.9%
EU institutions	823	15.7%	25.8%	333	26.4%	20.8%
Other	705,450	1.5%	23.3%	184,795	2.6%	20.2%

Source: London Economics based on TED transactions and Orbis database.
Note: The total number and value of awards across contracting authorities are not comparable to Table 12 as contracting authority was not available for all contract awards.

3.8. Classical and Utilities Directives

This sub-section examines the trends in cross-border procurement across the Classical and Utilities Directives.[43]

42 EU institutions unsurprisingly engage in the highest share of direct cross-border procurement with 13.8% of all awards and 26.4% of the value of all awards corresponding to direct cross-border awards. However, it should be noted that this result is based on only a small number of contract awards.

The share of direct cross-border procurement was considerably **higher in awards covered by the Utilities Directive than the Classical Directive** in terms of both number and value of contract awards. In particular**,** the share of direct cross-border procurement in the number of awards was 4.3% in awards covered by the Utilities Directive relative to 1.5% in awards covered by the Classical Directive.

This difference is likely to be largely explained by the differences in the types of goods and services covered by the Utilities and Classical Directives although it could also be due to the greater flexibility that contractors have under the Utilities Directive relative to the Classical Directive.

Comparing the shares of indirect cross-border procurement, there is less of a clear pattern. Although the share of indirect cross-border contracts in the number of awards is larger for contracts covered by the Classical Directive relative to the Utilities Directive, indirect cross-border procurement as a share of value of awards is higher for contracts covered by the Utilities Directive relative to the Classical Directive.

Table 39: Direct and indirect cross-border procurement by Classical and Utilities Directives between 2009 and 2015, EU28

Type of Directive	Total number of awards	Share of direct cross-border procurement in the number of awards	Share of indirect cross-border procurement in the number of awards	Total value of awards (EUR million)	Share of direct cross-border procurement in the value of awards	Share of indirect cross-border procurement in the value of awards
Classical	2,902,214	1.5%	22.2%	843,688	2.4%	20.0%
Utilities	174,904	4.3%	18.0%	156,315	5.5%	23.3%

Source: London Economics based on TED transactions and Orbis database.
Note: The total number and value of awards across type of directive are not comparable to Table 12 as type of directive was not available for all contract awards.

Between 2009 and 2015, the direct cross-border share in contracts covered by the Classical Directive, in terms of both number and value, generally rose with a sharp increase between 2012 and 2013. Direct cross-border shares in terms of both number and value of awards for contracts covered by the Utilities Directive did not follow a consistent trend over time with cross-border shares jumping from year to year.

As to the indirect cross-border shares, they were generally increasing in contracts covered by both the Utilities and Classical Directive in terms of both number and value of awards. Indeed, between 2009 and 2015 the share of indirect cross-border contracts covered by the Classical Directive rose from 20.1% to 22.9% in terms of number of awards and from 18.3% to 21.1% in terms of the value of awards. Over the same period, the share of indirect cross-border contracts covered by the Utilities Directive increased from 16.5% to 18.9% in terms of the number of awards and from 20.9% to 23.6% in terms of the value of awards.

Both the Utilities and Classical Directive were repealed and replaced in February 2014, however, due to lag in transposition and implementation it is likely to be too early to see any impact. Changes to the Directives included changes in the treatment of certain services, greater promotion of electronic procurement, more flexibility and changes to encourage more SMEs to bid for contracts.

43 As mentioned above, Directive 2004/18/EC on procurement procedures for the award of public works, supply and service contracts is often referred to as the Classical Directive, while Directive 2004/17/EC on procurement procedures of entities operating in the water, energy, transport and postal services sectors, is often referred to as the Utilities Directive.

Table 40: Direct and indirect cross-border procurement for the Classical Directive, by year, EU28

Year	Total number of awards	Share of direct cross-border procurement in the number of awards	Share of indirect cross-border procurement in the number of awards	Total value of awards (EUR million)	Share of direct cross-border procurement in the value of awards	Share of indirect cross-border procurement in the value of awards
2009	339,290	1.3%	20.1%	118,655	2.0%	18.3%
2010	383,521	1.4%	21.6%	117,398	2.1%	20.8%
2011	417,059	1.4%	21.6%	126,326	2.1%	19.1%
2012	436,531	1.3%	22.6%	123,307	2.3%	19.6%
2013	425,100	1.7%	22.4%	120,271	2.8%	19.6%
2014	449,609	1.7%	23.3%	118,383	2.9%	21.3%
2015	451,104	1.8%	22.9%	119,348	2.7%	21.1%

Source: London Economics based on TED transactions and Orbis database.

Table 41: Direct and indirect cross-border procurement for the Utilities Directive by year, EU28

Year	Total number of awards	Share of direct cross-border procurement in the number of awards	Share of indirect cross-border procurement in the number of awards	Total value of awards (EUR million)	Share of direct cross-border procurement in the value of awards	Share of indirect cross-border procurement in the value of awards
2009	21,071	4.2%	16.5%	20,272	5.3%	20.9%
2010	21,318	4.8%	18.3%	20,644	5.1%	23.2%
2011	25,167	4.5%	17.9%	21,657	6.6%	23.7%
2012	25,528	3.7%	17.5%	21,296	5.0%	22.5%
2013	26,420	4.4%	18.2%	24,005	5.1%	24.0%
2014	26,219	4.3%	18.4%	22,324	5.7%	24.6%
2015	29,181	4.1%	18.9%	26,117	5.8%	23.6%

Source: London Economics based on TED transactions and Orbis database.

3.9. Type of procedure

Differentiating across different types of procedure, contracts awarded by negotiation without a call for competition and contracts awarded through competitive dialogue were those with the highest shares of direct and indirect cross-border procurement in terms of number of awards.

For instance, of the contracts awarded by negotiation without a call for competition over 26.6% of the number of awards and 31.0% of the value of awards were allocated through indirect cross-border procurement. However, both these procedures combined make up only 2.8% of all contracts.

Open procedures, which cover 84% of all contract awards, have relatively low shares of direct cross-border procurement in terms of both number and value of awards with shares at 1.4% and 2.4% respectively. The respective shares of indirect cross-border procurement are much higher, at 22.6% of the number of awards and 20.0% of the value of awards.

Although type of procedure used clearly has a bearing on cross-border participation, this does not seem to strongly relate to the 'openness' of the type of procedure. Moreover, these results

may simply be highlighting differences across the nature of the contracts covered by the different procedures.

Table 42: Direct and indirect cross-border procurement by type of procedure between 2009 and 2015, EU28

Type of procedure	Total number of awards	Share of direct cross-border procurement in the number of awards	Share of indirect cross-border procurement in the number of awards	Total value of awards (EUR million)	Share of direct cross-border procurement in the value of awards	Share of indirect cross-border procurement in the value of awards
Open	2,595,871	1.4%	22.6%	695,606	2.4%	20.0%
Restricted	156,953	2.1%	18.5%	125,213	2.5%	18.5%
Negotiated with a call for competition	118,787	4.5%	17.9%	77,461	5.5%	23.4%
Award without prior publication of a contract notice [44]	90,115	1.5%	10.6%	33,240	2.1%	12.9%
Negotiated without a call for competition	81,003	5.7%	26.6%	49,835	8.6%	31.0%
Accelerated restricted	17,098	3.3%	19.2%	9,750	3.3%	18.9%
Not specified	13,486	2.3%	20.4%	5,096	4.0%	20.7%
Accelerated negotiated	5,825	4.3%	19.6%	3,199	3.6%	23.3%
Competitive dialogue	4,958	5.6%	22.7%	6,965	4.4%	21.0%

Source: London Economics based on TED transactions and Orbis database.

3.10. Type of award criteria

A contract can be awarded based on two possible criteria:

- Lowest price – where the price of the bid is the main factor which distinguishes across bids
- Most economically advantageous tender – where the quality, technical specification and price of the bid are all factors in assessing the bids

The share of direct cross-border procurement in the number of awards was higher where the award criteria was 'most economically advantageous tender' relative to the 'lowest price' at 2.0% relative to 1.4%.

The opposite is true for the share of direct cross-border in terms of value of awards. In turn, although a small relative percentage of lowest price contracts are direct cross-border, these tend to be higher value awards.

44 This refers to contracts which generally fulfilled unusual circumstances which include:
- No tenders or suitable tenders in response to either open or restricted procedures.
- Products are manufactured purely for the purpose of researc/ experiment/ study or development.
- The works/good services can be provided by a paticular tendered for: technical, artistic or exclusive right.
- Extreme urgency.

Regarding the share of indirect cross-border procurement in the number and value of awards, this was generally higher in contracts awarded to the lowest price than in those allocated as the most economically advantageous tender.

Table 43: Direct and indirect cross-border procurement by award criteria between 2009 and 2015, EU28

Type of award criteria	Total number of awards	Share of direct cross-border procurement in the number of awards	Share of indirect cross-border procurement in the number of awards	Total value of awards (EUR million)	Share of direct cross-border procurement in the value of awards	Share of indirect cross-border procurement in the value of awards
Lowest price	1,316,214	1.4%	23.4%	371,041	3.2%	22.0%
Most economically advantageous tender	1,513,333	2.0%	20.5%	567,998	2.8%	19.3%
Not specified	254,549	2.0%	22.9%	67,328	3.3%	21.7%

Source: London Economics based on TED transactions and Orbis database.

3.11. EU funds

Comparing awards by whether they were financed by EU funds, the **direct cross-border share of procurement** in terms of both the number and value of awards **was larger for awards financed by EU funds** relative to awards which were not financed by EU funds or where funding was not specified.

On the other hand, the share of **indirect cross-border procurement was considerably lower** for awards financed by EU funds at 12.7% relative to 23.0% for awards that were not financed by EU funds and 21.2% where the source of funding was not specified. However, in terms of the share of indirect cross-border procurement in the value of awards, this gap was much smaller with the share of indirect cross-border procurement at 18.3% for awards financed by EU funding relative to 20.9% and 20.0% for awards which were not financed by EU funds or where the source of funding was not specified.

This implies that although a small share of indirect cross-border procurement in the number of awards is financed by EU funds: these are generally large contracts in terms of value.

Table 44: Direct and indirect cross-border procurement by whether award notice was funded by EU funds between 2009 and 2015, EU28

Financing by EU funds	Total number of awards	Share of direct cross-border procurement in the number of awards	Share of indirect cross-border procurement in the number of awards	Total value of awards (EUR million)	Share of direct cross-border procurement in the value of awards	Share of indirect cross-border procurement in the value of awards
Yes	238,927	2.7%	12.7%	123,767	4.9%	18.3%
No	2,179,562	1.6%	23.0%	701,462	2.8%	20.9%
Not specified	665,607	1.8%	21.2%	181,138	2.1%	20.0%

Source: London Economics based on TED transactions and Orbis database.

3.12. Number of offers

The share of **direct cross-border awards and indirect cross-border** awards is **higher** for contracts with **one or a very small number of offers** relative to contracts with a higher number of offers.

This suggests that when there are many suppliers to choose from contracting authorities are less likely to choose cross-border suppliers. However, it should be noted that awards with only very few offers are more likely to be more specialised awards where domestic firms may not have the required expertise.

Table 45: Direct and indirect cross-border procurement by number of offers between 2009 and 2015, EU28

Number of offers	Total number of awards	Share of direct cross-border procurement in the number of awards	Share of indirect cross-border procurement in the number of awards	Total value of awards (EUR million)	Share of direct cross-border procurement in the value of awards	Share of indirect cross-border procurement in the value of awards
1	638,880	2.1%	27.1%	164,109	4.7%	24.6%
2	433,475	1.6%	20.9%	123,200	3.7%	23.1%
3	363,221	1.6%	20.4%	121,413	3.4%	21.4%
4	268,279	1.5%	20.2%	103,156	2.4%	20.8%
5-9	515,399	1.5%	18.3%	232,891	2.4%	17.9%
10-14	138,636	1.3%	18.1%	63,090	1.9%	17.7%
15-19	69,048	1.4%	20.2%	26,891	1.5%	18.8%
20 or over	170,406	1.2%	22.0%	68,857	0.8%	14.4%
Not specified	486,752	2.0%	23.4%	102,760	3.2%	21.0%

Source: London Economics based on TED transactions and Orbis database.

3.13. Framework agreements and dynamic purchasing systems

The share of direct cross-border awards in the number of awards was **substantially lower** for **contracts awarded through dynamic purchasing systems** relative to other contract awards.

As to the share of indirect cross-border awards in the number of awards, this was substantially higher for contracts awarded through dynamic purchasing systems at 44.7% relative to 23.5% of the contracts awards through framework agreements and 21.0% of the contracts which were procured through neither framework agreements nor dynamic purchasing systems.

This sizable difference in the shares of direct and indirect cross-border procurement, however, disappears when considering the value of awards. In turn, although contracts awarded through dynamic purchasing systems are less likely to be awarded directly cross-border, the direct cross-border contracts which are awarded tend to be larger relative to contracts awarded through other means. The opposite it is true for indirect cross-border contracts awarded through dynamic purchasing systems.

Table 46: Direct and indirect cross-border procurement by framework agreement and dynamic purchasing systems between 2009 and 2015, EU28

Techniques and instruments	Total number of awards	Share of direct cross-border procurement in the number of awards	Share of indirect cross-border procurement in the number of awards	Total value of awards (EUR million)	Share of direct cross-border procurement in the value of awards	Share of indirect cross-border procurement in the value of awards
Framework agreement	683,264	1.6%	23.5%	209,000	2.4%	21.8%
Dynamic purchasing system	42,749	0.8%	44.7%	7,013	3.3%	21.3%
Neither	2,354,975	1.7%	21.0%	788,099	3.1%	20.1%

Source: London Economics based on TED transactions and Orbis database.
Note: There 104 contract awards which were recorded as being both part of a framework agreement and dynamic purchasing system, these were included in the 'Neither' section. The total number and value of awards across techniques and instruments are not comparable to Table 12 as techniques and instruments were not available for all contract awards.

3.14. Size of bidder

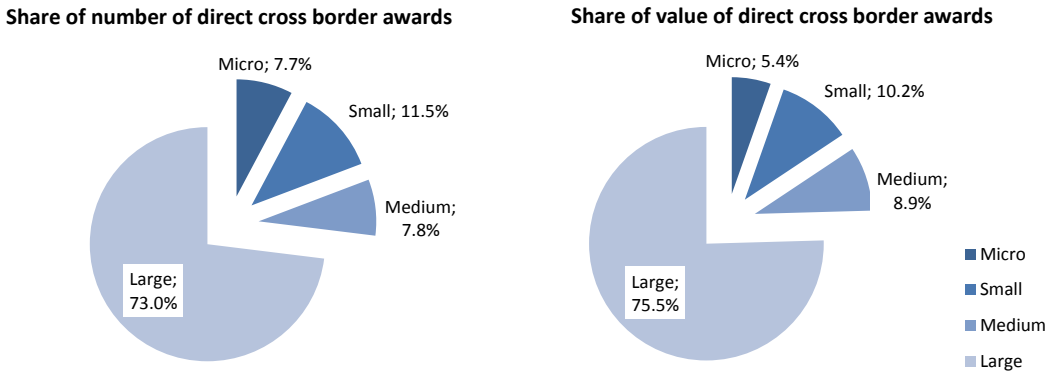
Based on a sample of the data[45], the breakdown of direct and indirect cross-border awards was also analysed by size of firm.

The share of SMEs is estimated at 27.0% of the number and 24.5% of the value of direct cross border awards. The share of SMEs in indirect cross border is much smaller and estimated at under 3% in terms of both number and value of contract awards.

Among SME classes, small firms accounted for the highest share of cross-border awards. The graphs below provide the detailed results.

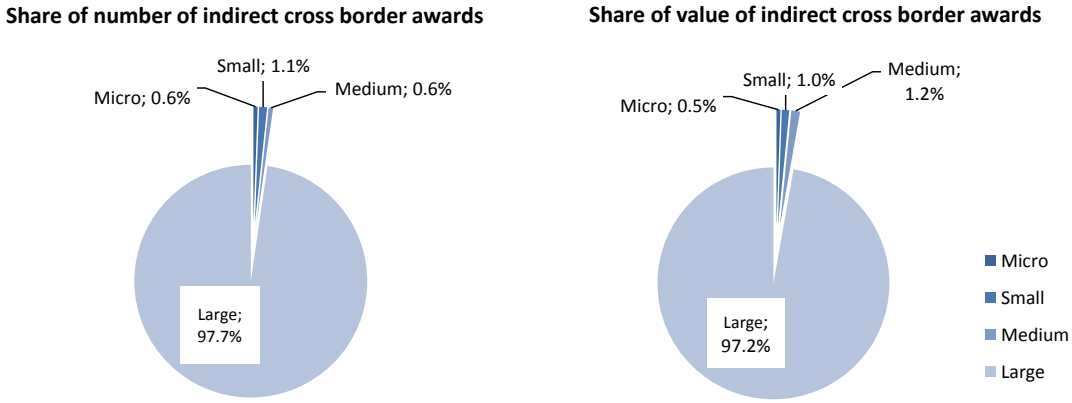
45 Details of the methodology for the analysis in this sub-section are provided in annex 6.4.4.

Figure 15: Distribution of direct cross-border procurement, in % of number and value of awards, by size of bidder, EU28



Source: London Economics based on TED transactions and Orbis database.
Notes: Based on a sample of approximately 30,000 direct cross-border contract awards.

Figure 16: Participation in indirect cross-border procurement, in % of number and value of awards, by size of bidder, EU28



Source: London Economics based on TED transactions and Orbis database.
Notes: Based on a sample of approximately 700,000 indirect cross-border contract awards.

It can be noted that, over time, the share of SMEs in the total number of both direct cross-border awards and indirect cross-border awards has remained broadly stable.

Table 47: Participation in direct cross-border procurement, by size of bidder, per year, EU28

Year	Number of contract awards	Shares in the number of contract awards				
		SME	*Micro*	*Small*	*Medium*	Large
2009	3,641	27.1%	8.5%	10.7%	7.9%	72.9%
2010	4,219	26.1%	9.3%	10.2%	6.6%	73.9%
2011	4,936	26.0%	6.8%	12.6%	6.7%	74.0%
2012	4,469	27.7%	7.9%	11.6%	8.2%	72.3%
2013	4,772	26.4%	7.4%	11.3%	7.8%	73.6%
2014	5,600	27.3%	7.2%	11.7%	8.4%	72.7%
2015	5,845	27.8%	7.4%	11.9%	8.5%	72.2%

Source: London Economics based on TED transactions and Orbis database.
Notes: Based on a sample of approximately 30,000 direct cross-border contract awards.

Table 48: Participation in indirect cross-border procurement, by size of bidder, per year, EU28

Year	Number of contract awards	Shares in the number of contract awards				
		SME	*Micro*	*Small*	*Medium*	Large
2009	74,224	2.5%	0.7%	1.0%	0.7%	97.5%
2010	95,125	2.3%	0.6%	1.1%	0.6%	97.7%
2011	101,221	2.2%	0.6%	1.0%	0.6%	97.8%
2012	126,339	2.1%	0.5%	1.0%	0.6%	97.9%
2013	110,153	2.4%	0.5%	1.3%	0.5%	97.6%
2014	121,363	2.3%	0.5%	1.2%	0.6%	97.7%
2015	140,354	2.3%	0.5%	1.0%	0.7%	97.7%

Source: London Economics based on TED transactions and Orbis database.
Notes: Based on a sample of approximately 700,000 indirect cross-border contract awards.

For an in-depth discussion of the issues associated with the estimates presented above, please see annex 6.4.4.

3.15. Comparison of TED data analysis with input-output tables analysis

Table 49 compares the cross-border procurement shares with the import penetration found in section 2.

For comparability, the shares of direct cross-border and indirect cross-border are taken from the same year as the import penetration wherever possible. For Portugal, Latvia & Croatia, it was not possible to compare the same year and as such the closest available years were compared.

As such, across all Member States, it can be observed that the total share of direct plus indirect cross-border procurement is generally considerably higher than import penetration in total public sector use, with the exception of Bulgaria, Hungary, Ireland and Latvia.

Table 49: Comparison of public sector import penetration with the share of cross-border public procurement, per country

Country	Public sector import penetration	Direct cross-border procurement in the value of awards	Indirect cross-border procurement in the value of awards
Austria, 2012	10%	4%	18%
Belgium, 2010	9%	5%	32%
Bulgaria, 2010	20%	2%	11%
Croatia, 2010*	10%	5%	40%
Czech R., 2012	17%	4%	29%
Cyprus	-	-	-
Denmark, 2011	7%	5%	32%
Estonia, 2011	15%	13%	26%
Finland, 2011	8%	3%	22%
France, 2012	8%	4%	18%
Germany, 2011	7%	2%	18%
Greece, 2010	10%	5%	19%
Hungary, 2012	14%	3%	11%
Ireland, 2011	16%	4%	10%
Italy, 2012	6%	3%	25%

Country	Public sector import penetration	Direct cross-border procurement in the value of awards	Indirect cross-border procurement in the value of awards
Latvia,1998	16%	1%	9%
Lithuania, 2010	12%	3%	43%
Luxembourg	-	-	-
Malta, 2010	7%	24%	14%
Netherlands, 2012	7%	2%	15%
Poland, 2010	8%	1%	23%
Portugal, 2008	9%	6%	20%
Romania	-	-	-
Slovakia, 2011	17%	8%	27%
Slovenia, 2010	12%	3%	11%
Spain, 2010	8%	1%	21%
Sweden, 2011	6%	2%	20%
UK	-	-	-
EU	8%	3%	20%

Source: London Economics based on TED transactions and Orbis database; import penetration based on Eurostat's supply, use and input-output tables.
Note: The table uses the latest available year, per country, in Eurostat's supply, use and input-output tables and compares with closest year in TED, for the same country.

In turn, there appears to be no relationship between import penetration and direct cross-border procurement at the country level.

In order to compare the cross-border shares with the import penetration results from section 2, all sectors were converted to the CPV classification.[46]

At the sector level, there appears to be no relationship between direct cross-border import shares and import penetration. This result is surprising but may well be due to the difficulties involved in matching the TED and import penetration results.[47]

Please see Table 77 in annex 6.7.3 for further details.

46 Due to the difficulties in converting from CPA to CPV codes, an approximate match was used: in some cases, CPV and CPA codes were grouped and not all codes were matched. Please see section 7.8.2 for further details.
Note that 1,807,219 contract awards had associated NACE R2 codes from Orbis (nearly all of these were also recorded in CPV code), but this is around half the number of contract awards recorded in CPV sectors. As a result, it was decided to report the cross-border shares of TED contracts in terms of CPV sectors.
47 Difficulties included availability of countries by the correct year and matching between CPV and CPA sectors.

4. EXPLANATORY FACTORS FOR CROSS-BORDER PROCUREMENT

This chapter presents factors that influence the rationale for cross-border public procurement combining the results from two different sources:

- A survey of economic operators;
- Qualitative case studies on selected topics.

Findings are presented from the perspective of businesses (*sell side*) and contracting authorities (*buying side*).

4.1. The business perspective

This chapter presents findings on businesses' views on cross-border procurement. Companies with experience in dealing with public procurement in the EU were consulted though an online survey.[48]

The contact details extracted from TED database have been used to build up our sample. We received 1,791 answers to our survey:

- 790 were '*completed*' answers (i.e. the respondent went through all the questions and submitted the questionnaire);
- 1,001 were '*partial*' answers (i.e. the respondent abandoned the questionnaire at a certain point).

All the '*partial*' answers were checked manually to assess their relevance and potential inclusion in the final sample. '*Partial*' answers that provided more information than basic company information (in total 221 answers) were included. Thus, our sample includes 1,011 (790+221) answers.

Our conclusions regarding experience of economic operators with public procurement are based on the answers to the survey using descriptive statistics technique (e.g. percentage distribution). The analysis is complemented with visual aids (e.g. column charts, pie charts, etc.).

4.1.1. Information about the respondents of the survey

The following tables and figures present basic information about the respondents.

Forty-one countries are represented in the survey, the 28 Member States plus thirteen non-EU countries (Australia, Bhutan, Canada, Ethiopia, Iceland, India, Switzerland, Japan, Macedonia, Norway, Serbia, Singapore and the USA). The highest number of responses was received from the UK (16.12% of respondents). Additionally, as the survey was distributed in English, it may partly explain that countries where English is an official language (UK-IE-MT) jointly accounted for the ca. 22% of the responses received. In comparison with the 2011 study, our survey has a broader geographical coverage (41 countries vs. 12 countries).

48 The survey took place from May to July 2016.

Table 50: Sample distribution by countries

Countries	Percentage	Frequency
UK – United Kingdom	16.1%	163
DE – Germany	7.1%	72
RO – Romania	6.2%	63
Non-EU countries	4.5%	45
NL – the Netherlands	4.4%	44
EL – Greece	4.2%	42
DK – Denmark	4.0%	40
EE – Estonia	3.9%	39
BE – Belgium	3.8%	38
IE – Ireland	3.8%	38
HU – Hungary	3.5%	35
IT – Italy	3.4%	34
LT – Lithuania	3.0%	30
ES – Spain	2.9%	29
FR – France	2.9%	29
SE – Sweden	2.9%	29
SK – Slovakia	2.9%	29
LV – Latvia	2.8%	28
PL – Poland	2.7%	27
BG – Bulgaria	2.5%	25
MT – Malta	2.3%	23
CZ – Czech Republic	2.2%	22
AT – Austria	2.1%	21
PT – Portugal	1.9%	19
CY – Cyprus	1.4%	14
HR – Croatia	1.1%	11
SI – Slovenia	1.1%	11
FI – Finland	1.0%	10
LU – Luxembourg	0.1%	1
Total	**100.0%**	**1011**

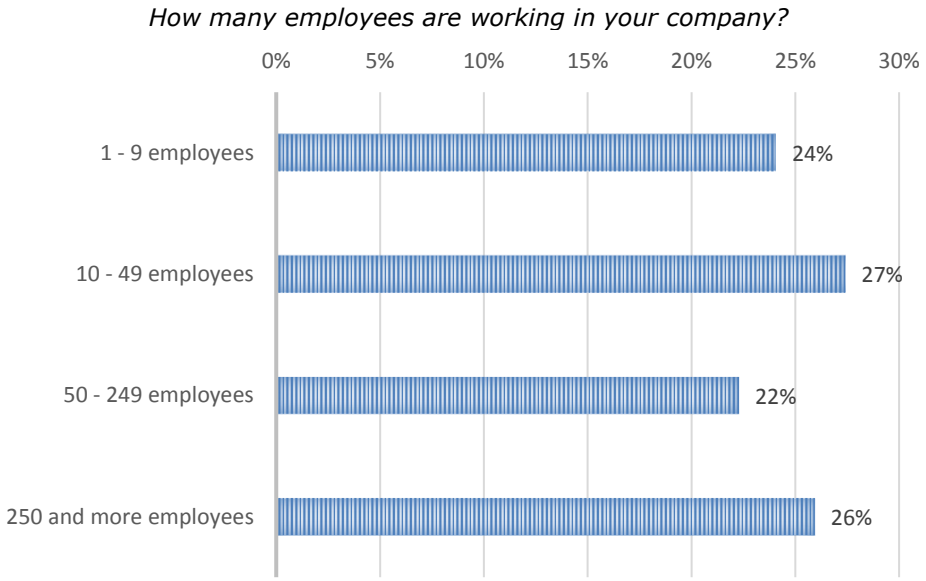
Table 51: Sample distribution by non-EU countries

Countries	Percentage	Frequency
NO – Norway	46.7%	21
CH – Switzerland	11.1%	5
CA – Canada	6.7%	3
IN – India	6.7%	3
JP – Japan	4.4%	2
MK – FYROM	4.4%	2
USA – United States of America	4.4%	2
AU – Australia	2.2%	1
BT – Bhutan	2.2%	1

Countries	Percentage	Frequency
ET – Ethiopia	2.2%	1
IS – Iceland	2.2%	1
RS – Republic of Serbia	2.2%	1
SG – Singapore	2.2%	1
N/A	2.2%	1
Total	**100.0%**	**45**

Companies of all sizes are represented in the survey. The table below shows their distribution. The sample includes 24% of micro companies with fewer than 10 employees as well as 26% of large companies with more than 250 employees.

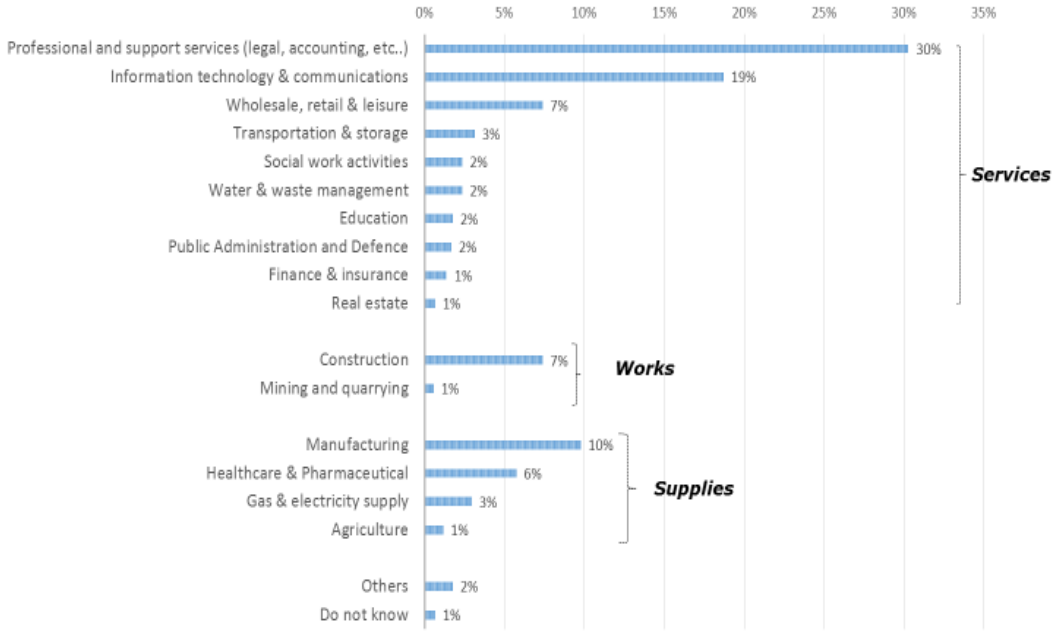
Figure 17: Number of employees



The following figure illustrates that companies from all relevant sectors are represented in the survey. The highest number of responses was received in 'Professional and support services (legal, accounting, science & engineering)', while the lowest number of responses was received in 'Real Estate', 'Finance & Insurance', 'Agriculture' and 'Mining & quarrying'. Supplies accounts for 19.69% number of responses, Works as 8.01% number of responses and Services as 69.83% number of responses.

Figure 18: Sectors

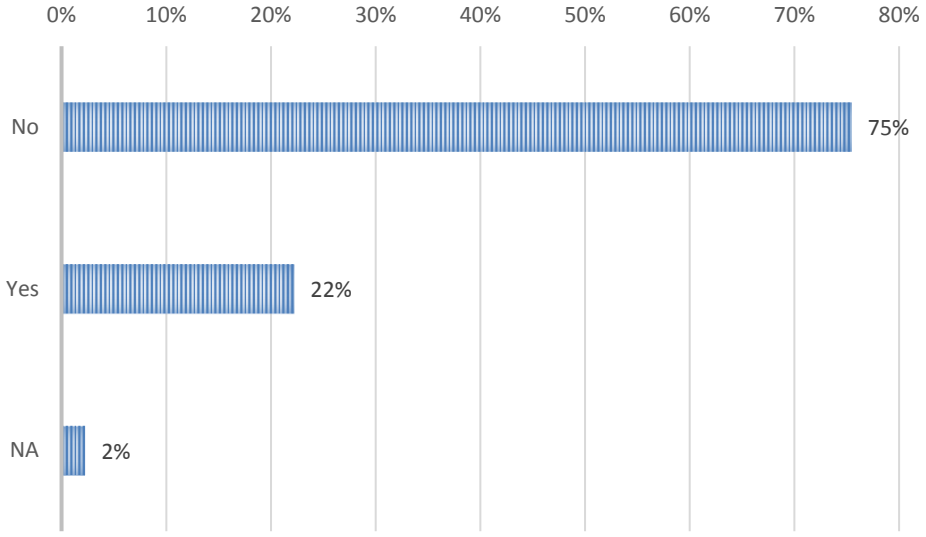
Which sector does your company operate in?



The figure below provides information about the ratio of companies which are foreign affiliates of other companies located abroad. 22% belong to foreign company/group.

Figure 19: Foreign affiliates

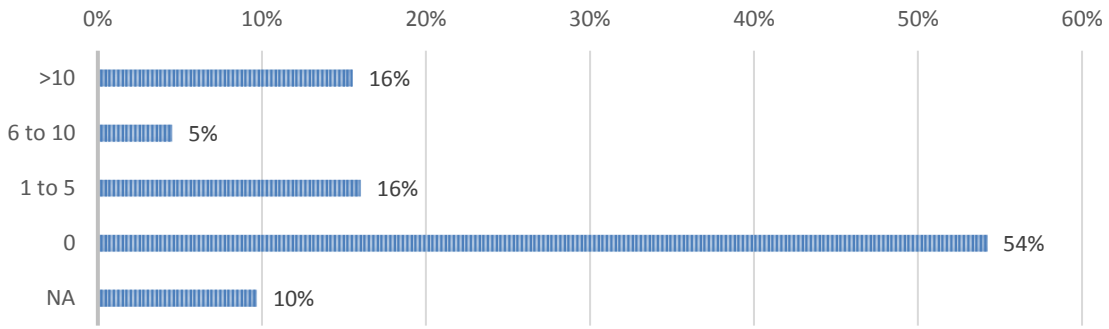
Is your company a subsidiary/foreign affiliate i.e. it is owned by another company located abroad?



Just over half of the respondents claim that their parent company has not established any company abroad as shown in figure below.

Figure 20: Subsidiaries/affiliates

How many subsidiaries/affiliates has your parent company established abroad?



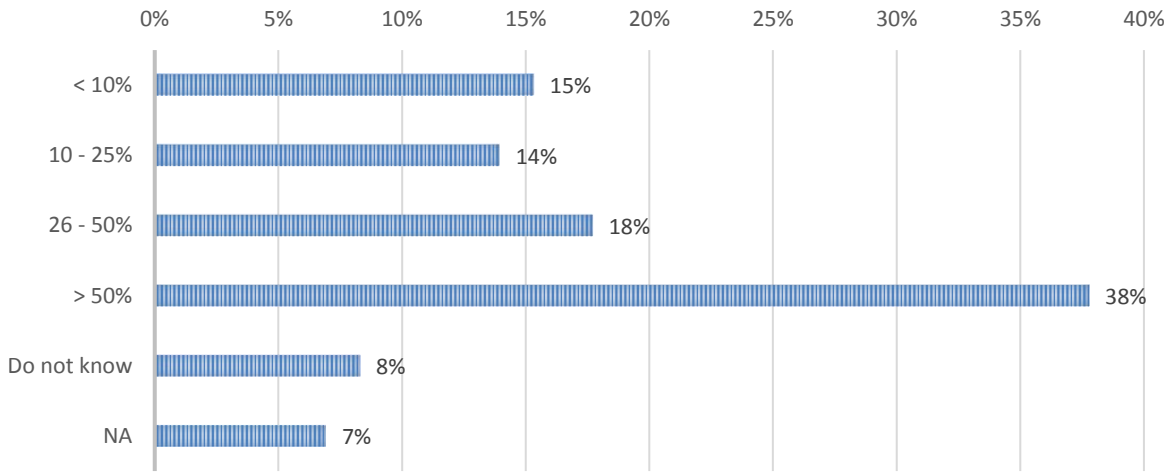
4.1.2. Businesses' experience with public procurement

As only businesses with experience in public procurement were surveyed, no respondents reported that they had never participated in public procurement. The following findings are broken down in '*Total*' (total sample of the survey), '*SMEs*' (companies with less than 250 employees) and '*Large companies*' (companies with more than 250 employees).[49] The aim of this analysis is to highlight any differences influenced by company size.

Figure 21 shows that the public sector is an important client for most of the businesses surveyed: 56% of the participants generate more than 25% of their turnover from the public sector clients. This percentage drops when the turnover coming from cross-border public procurement is considered: about 62% of the respondents claim that it counts less than 10% of their turnover (Figure 22).

Figure 21: Share of turnover from public procurement

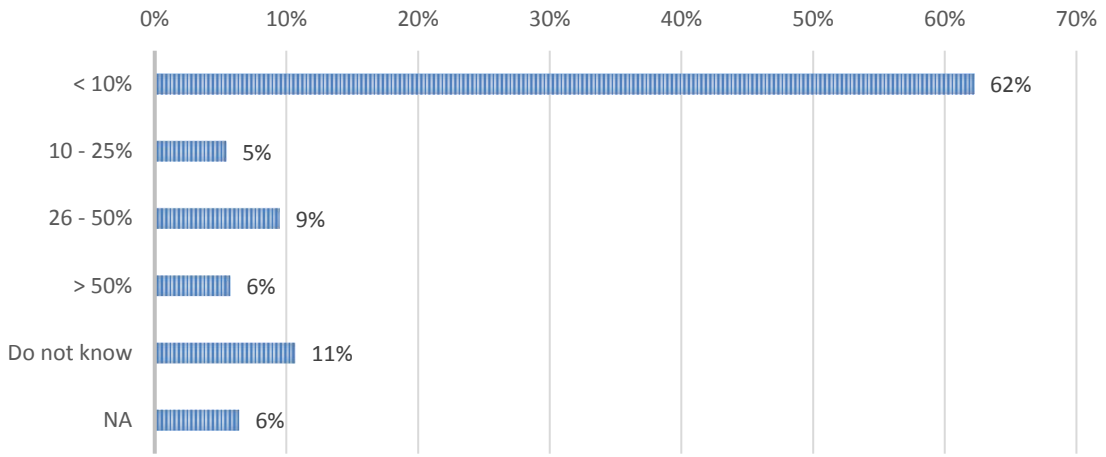
Approximately what share of your company's turnover comes from public procurement (domestic and cross-border)?



49 The staff headcount was used as proxy to classify companies taking into account the European Commission's "User guide to the SME definition" available at: http://ec.europa.eu/growth/smes/business-friendly-environment/sme-definition_en.

Figure 22: Share of turnover from cross-border public procurement

Approximately what share of your turnover comes from cross-border public procurement?



Businesses were asked how often they bid and how successful they had been with bidding, both in general and cross-border in the last three years (Figure 23, Figure 24, Figure 25, Figure 26).

About 58% of the companies had participated frequently in public tenders (more than 20 times in the past three years). Narrowing the question down to participation in cross-border public procurement, the picture changes, as 38% said that have not engaged in cross-border tendering at all in the past three years, whereas 13% reported that they participated more than 20 times.

In other words, even though most surveyed businesses engage regularly in public procurement in general, they rarely engage in cross-border public procurement (either direct or indirect).

Figure 23: Participation in public procurement in the last three years

How often has your company participated in public procurement tenders (domestically and abroad) in the last three years?

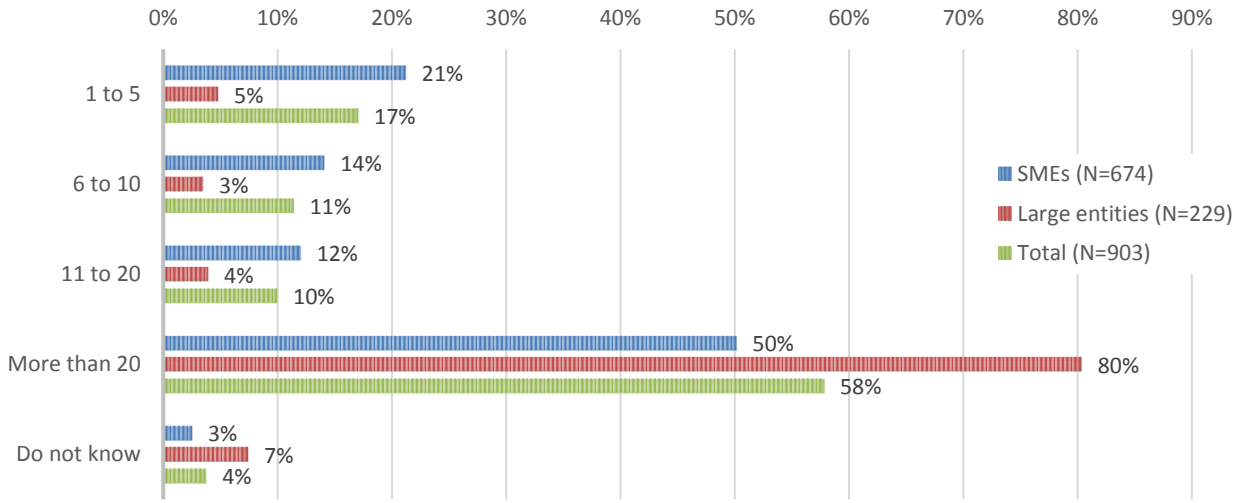
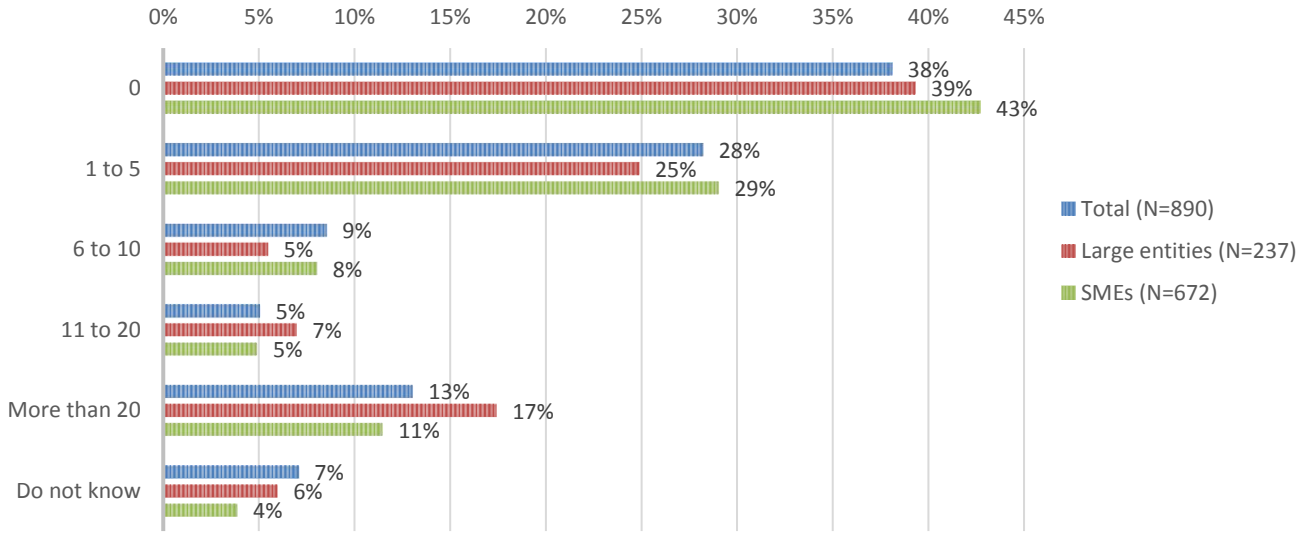


Figure 24: Participation in cross-border public procurement in the last three years

How often has your company participated in cross-border public procurement tenders in the last three years (either on its own or in cooperation with other companies, including companies from abroad)?



It is possible to observe large differences when considering size of the companies: 80% of large companies declared to have participated frequently (more than 20 times) in public procurement both domestically and/or abroad but this percentage drops to 50% when considering SMEs only.

43% of SMEs declared to not have participated in a cross-border bid in the last three years (39% for large entities), and only 11% of them engage frequently in public procurement abroad (17% for large entities).

It is possible to notice from Figure 23 & Figure 24 that SMEs dominates, in relative terms, the categories of low participation (i.e. less than 10 bids per year). This result indicates that surveyed SMEs have less frequently engaged in public procurement (either domestic or abroad) than large entities in the last three years.

Figure 25 displays information about the success rate of companies participating in public procurement tenders both domestically and abroad within the last three years.

Figure 25: Success rate in public procurement in the last three years

What was your company's average success rate in public procurement tenders (domestically and abroad) in the last three years?

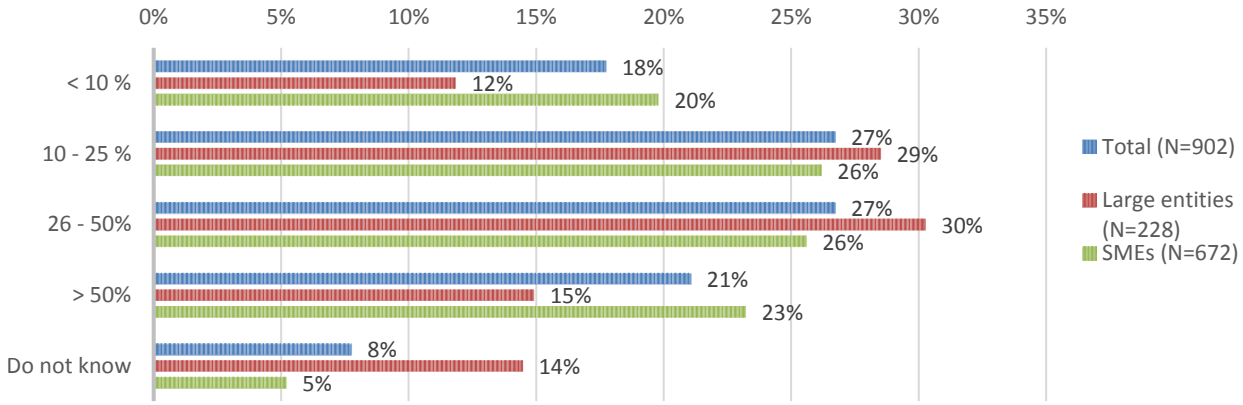
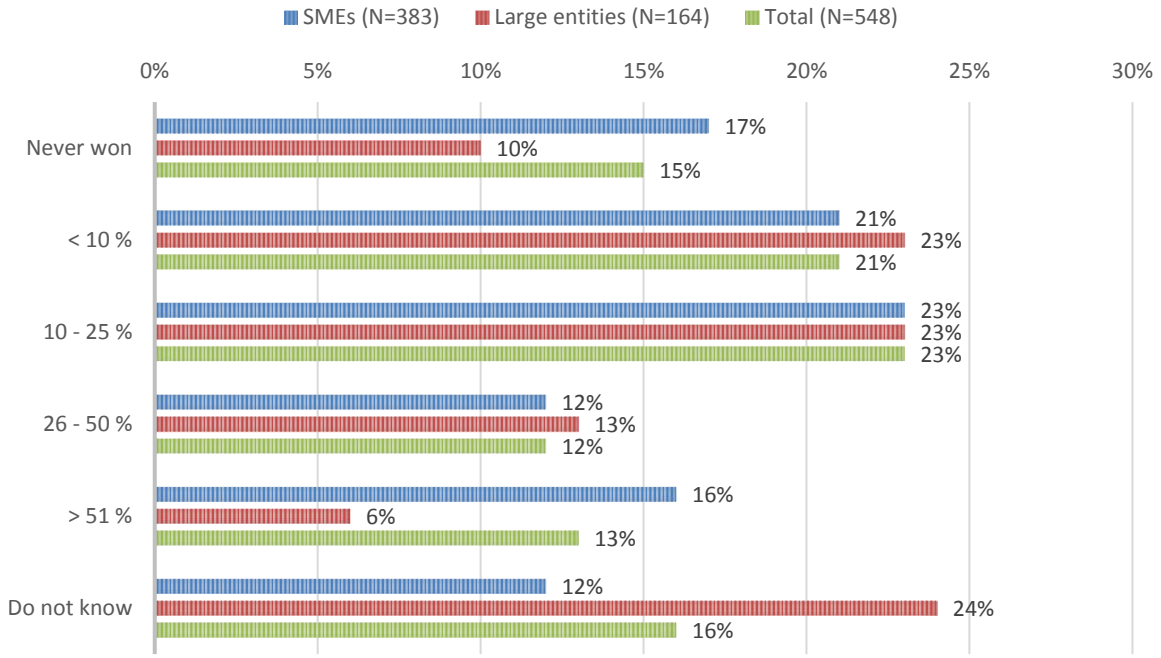


Figure 26: Success rate in cross-border public procurement in the last three years

What was your company's average success rate when participating in cross-border public procurement tenders in the last three years (either on its own or in cooperation with other companies, including companies from abroad)?



The success rate of the businesses surveyed is on average higher for domestic bids than for cross-border bids. Figure 25 indicates that 48% of the respondents succeeded in more than 25% of their bids. In cross-border public procurement, 15% of the respondents stated that they have never won, 21% succeeded in less than 10% of cases, whereas only 13% reported a success rate of more than 50%.

When considering differences between SMEs and large companies, it is possible to observe that 17% of the SMEs declared to have never won a bid abroad and 21% of them had a 'hit rate' less than 10%. For large companies, the percentage of companies declaring to have never won is 10%, and 23% of them declared to have succeeded less 10% of their bids.

As already found in the previous 2011 Commission's study about cross-border public procurement[50], it appears that businesses not only bid less often cross-border but also are less successful when doing so. In the 2011 study, 34% of the respondents stated that they succeeded in less than 10% of cases in cross-border public procurement, while 25% reported a success rate of more than 40%. Results of the survey under the present study showed that only 6% of large companies and 16% of SMEs claim to have a success rate more than 50%.

4.1.2.1. Success factors in cross-border public procurement

The businesses were asked about their strategies in bidding cross-border procurements. As noted in section 3, cross-border procurement can take two forms direct or indirect:

- *Direct cross-border procurement*: it occurs when firms from their '*home'* country bid and win tenders launched in another Member State (i.e. 'Bidding directly abroad');
- *Indirect cross-border procurement*: it can occur mainly when firms bid for tenders launched by authorities of a different country through subsidiaries/affiliates located in the same country (i.e. 'Bidding through a subsidiary/affiliate located abroad');

50 http://ec.europa.eu/internal_market/publicprocurement/docs/modernising_rules/cross-border-procurement_en.pdf .

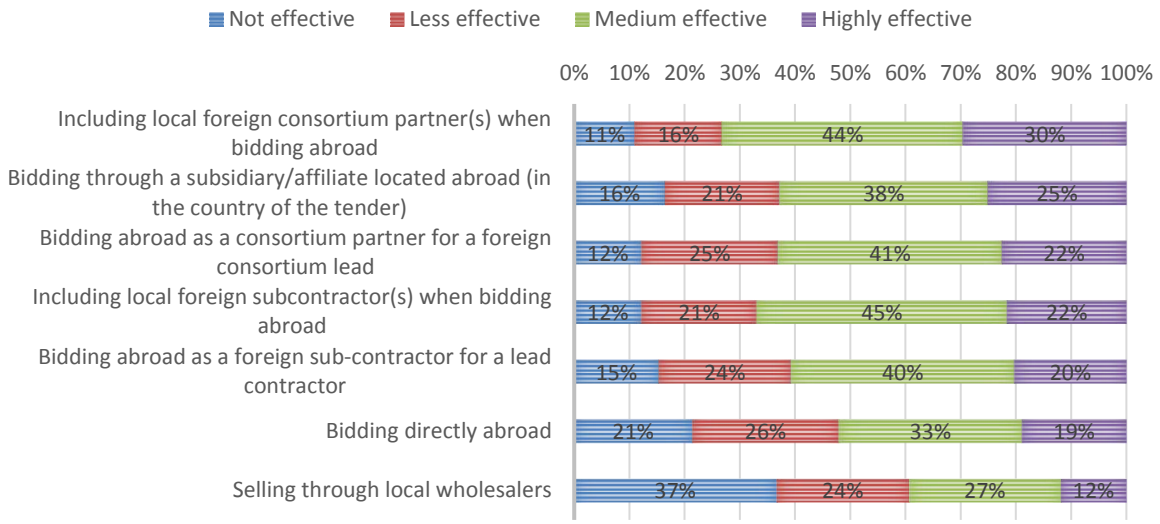
The following graphs show the results by different possible ways of bidding cross-border. 'Including local foreign consortium partner(s) when bidding abroad' is regarded as the most successful way: 30% of the businesses surveyed assess it as '*highly effective*' and a further 44% assess it as '*medium effective*'.

From the results shown in figure below, it is possible to observe that among the different ways of bidding, bidding indirectly through affiliates, consortia and/or subcontracting is regarded as more effective than bidding directly abroad. Only 'selling through local wholesalers' is perceived as less effective, with 37% of the businesses surveyed considering it as '*not effective*'.

This result is in contrast with the previous Commission's study on cross-border public procurement[51] , where is was found that the strategy 'to bid directly' was perceived as the most successful way compared to any indirect form.

Figure 27: Ways of bidding cross-border

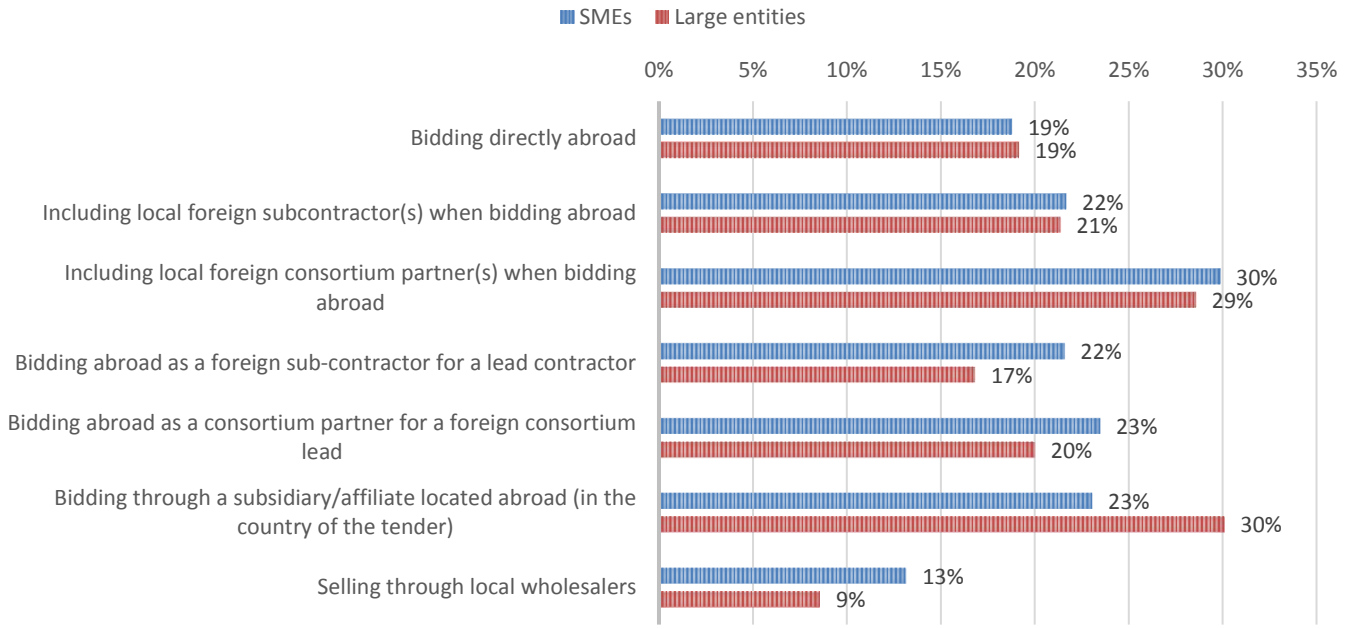
Based on your experience, what are the most effective/successful ways in bidding for cross-border public procurement tenders?



The following figure shows the share of respondents evaluating different ways in bidding for cross-border as '*highly effective*' broken down by company's size (SMEs vs. large companies).

51 http://ec.europa.eu/internal_market/publicprocurement/docs/modernising_rules/cross-border-procurement_en.pdf , p.89.

Figure 28: Ways of bidding cross-border – by company's size



The figure above shows that certain strategies of cross-border bidding are more effective for SMEs than for large companies. For example, SMEs who participated in the survey indicated that:

- 'Bidding abroad as a foreign sub-contractor for a lead contractor';
- 'Bidding abroad as a consortium partner for a foreign consortium lead';
- 'Selling through a local wholesaler';

are the most effective. In contrast, large companies regarded 'bidding through subsidiary/affiliate located abroad' as the most effective.

This can be explained by the different resources that smaller and bigger companies have: establishing foreign affiliates and bidding through these is likely to be more feasible for large entities that are likely to have more financial and human resources available for tendering. Similar results were also obtained in the 2011 study, in which SMEs indicated that the most effective ways to bid cross-border are:

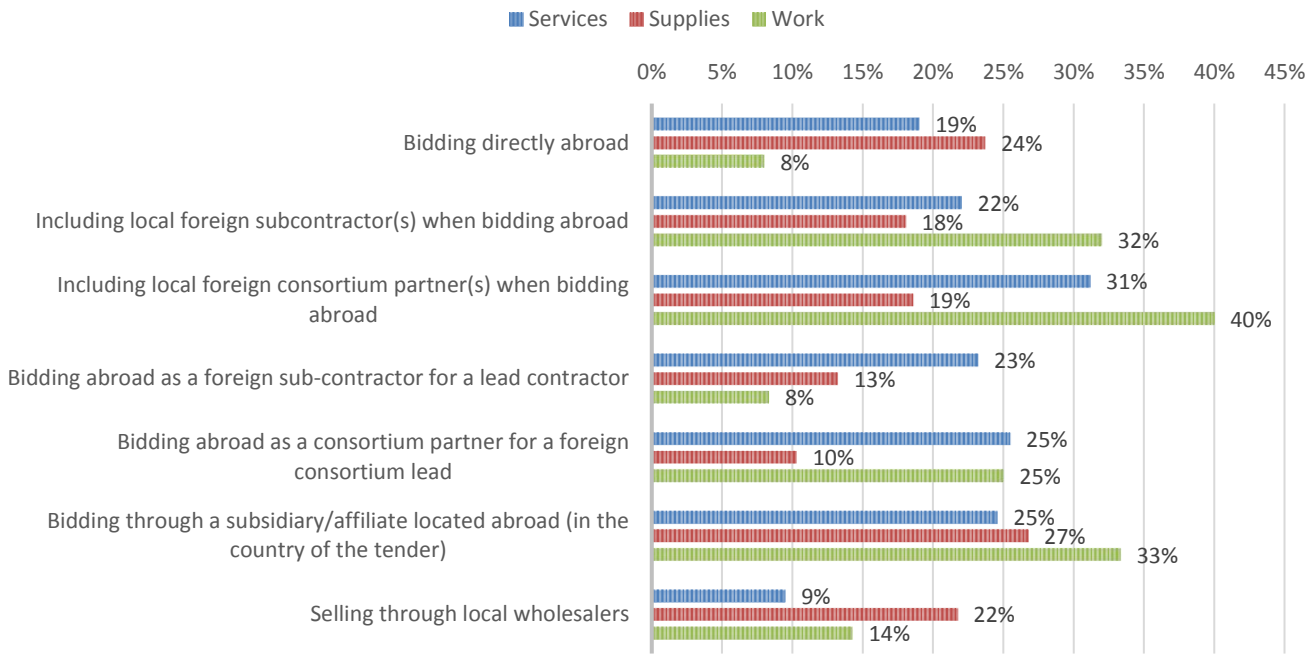
- 'acting as a subcontractor for a foreign lead contractor'; and
- 'selling through local wholesaler';

While large entities indicated to prefer:

- 'including local foreign subcontractors';
- 'acting as a consortium partner for a foreign consortium lead'; and
- 'bidding through affiliates abroad';

The following figure shows the share of respondents evaluating different ways in bidding for cross-border as '*highly effective*' broken down by sectors/types of contracts (works, services and supplies).

Figure 29: Ways of bidding cross-border – by services/supplies/works



From the received responses, it is possible to notice that certain strategies of cross-border bidding are more relevant for 'Services' and others are more relevant for 'Works' or 'Supplies'. For example, companies operating in work contracts regarded the most effective strategies as:

- 'Including local foreign consortium partner(s) when bidding abroad';
- 'Bidding through a subsidiary/affiliate located abroad (in the country of the tender)';
- 'Including local foreign subcontractor(s) when bidding abroad'.

Companies operating in the field of supplies regarded the most effective strategies as:

- 'Bidding through a subsidiary/affiliate located abroad (in the country of the tender)';
- 'Bidding directly abroad';
- 'Selling through local wholesalers'.

Respondents operating in the field of services most commonly prefer:

- 'Including a local foreign consortium partner when bidding abroad';
- 'Bidding abroad as a consortium partner for a foreign consortium lead';
- 'Bidding through a subsidiary/affiliate located abroad (in the country of the tender)'.

4.1.3. Barriers and factors hampering participation in cross-border public procurement

There are different barriers that may hamper the participation of companies in public procurement abroad. The following sub-sections show the results of businesses perception of the identified obstacles.

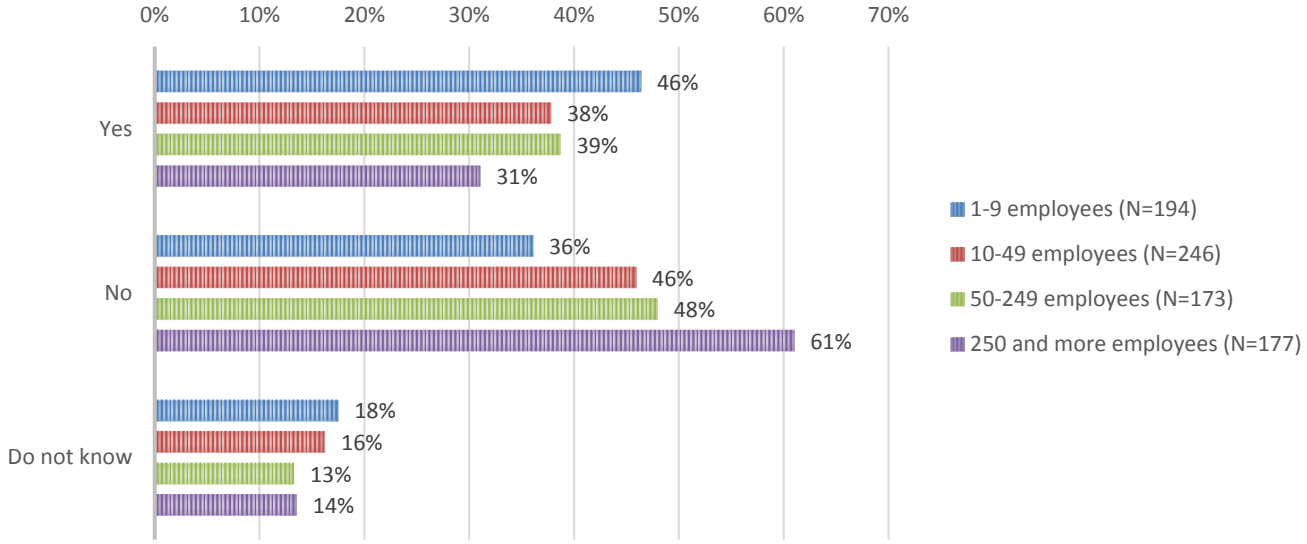
4.1.3.1. Access to information

In the course of the survey, businesses were asked whether information sources to identify procurement opportunity abroad represent a barrier affecting their participation.

The figure below shows that in general large enterprises do not consider access to information regarding cross-border public procurement tenders a barrier to participate. Similarly, this is the case for medium and small companies, even though the number of respondents indicating 'Yes' and 'No' are relatively close. Instead, the majority of micro-enterprises (46%) consider access to relevant information a barrier affecting their participation.

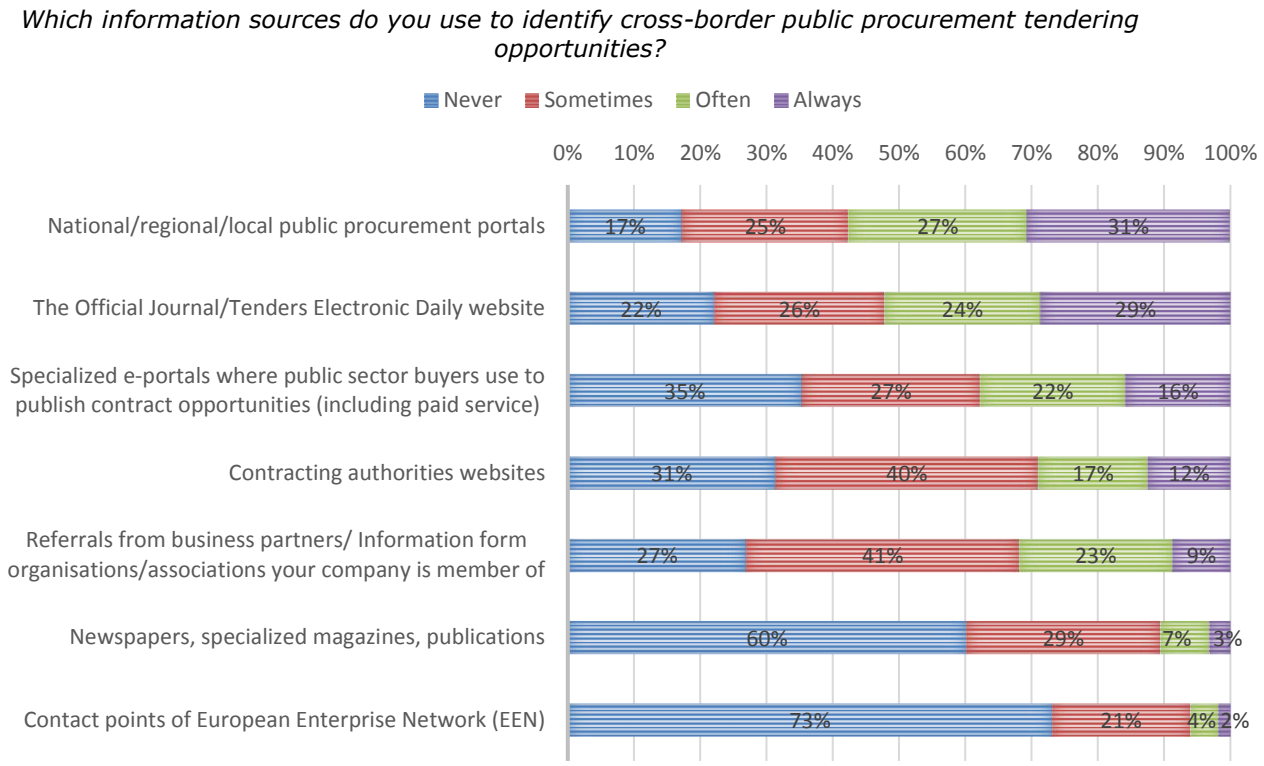
Figure 30: Access to information sources

Is access to information regarding cross-border public procurement tenders a barrier for your company to participate in these cross-border tenders?



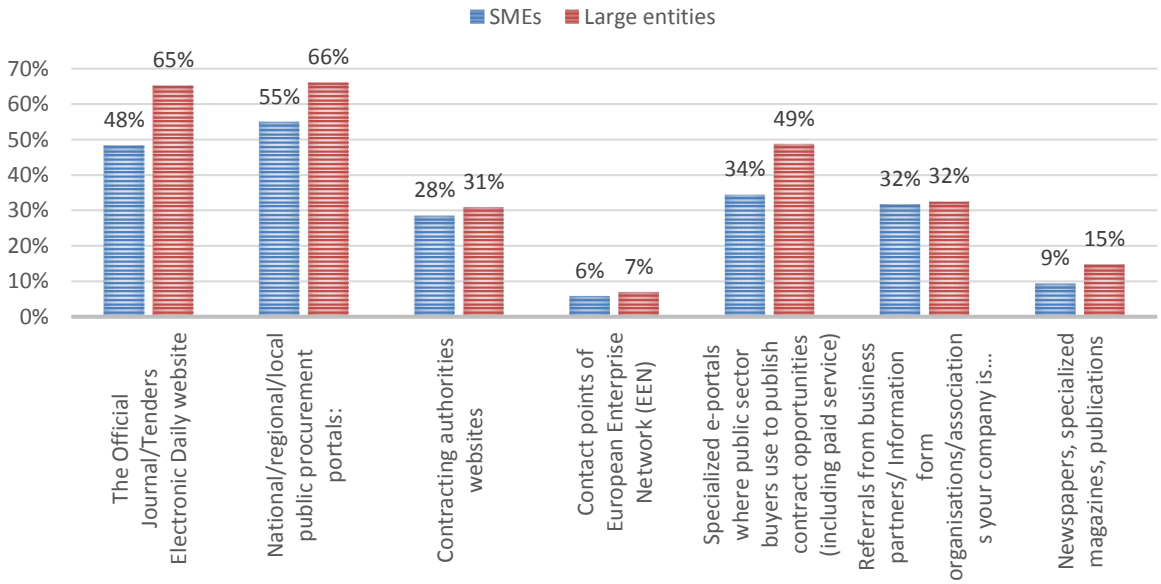
The following graphs show the results on different information sources for bidding cross-border. **'**National/regional/local public procurement portals**'** is regarded as the most popular mean: 31% of the business surveyed answered to monitor these information sources **'***always***'** and a further 27% replied to consult them **'***often***'**. On the other end, 73% of the respondents declared to have **'***never***'** consulted "Contact points of European Enterprise Network (EEN)**'**.

Figure 31: Information sources



The following figure shows the share of respondents declaring to use '*always*' and/or '*often*' the following sources of information broken down by company size.

Figure 32: Information sources – by company size



From the answers put forward to the responses that these information sources are considered more relevant by large companies compared to SMEs. Exception is made for the category 'Referrals from business partners/ information from organisations/associations your company is member of' which is considered equally important for both type of companies (according to size). These results may indicate that large companies can use more resources to monitor tendering opportunities through various information sources.

4.1.3.2. Other factors hampering cross-border participation

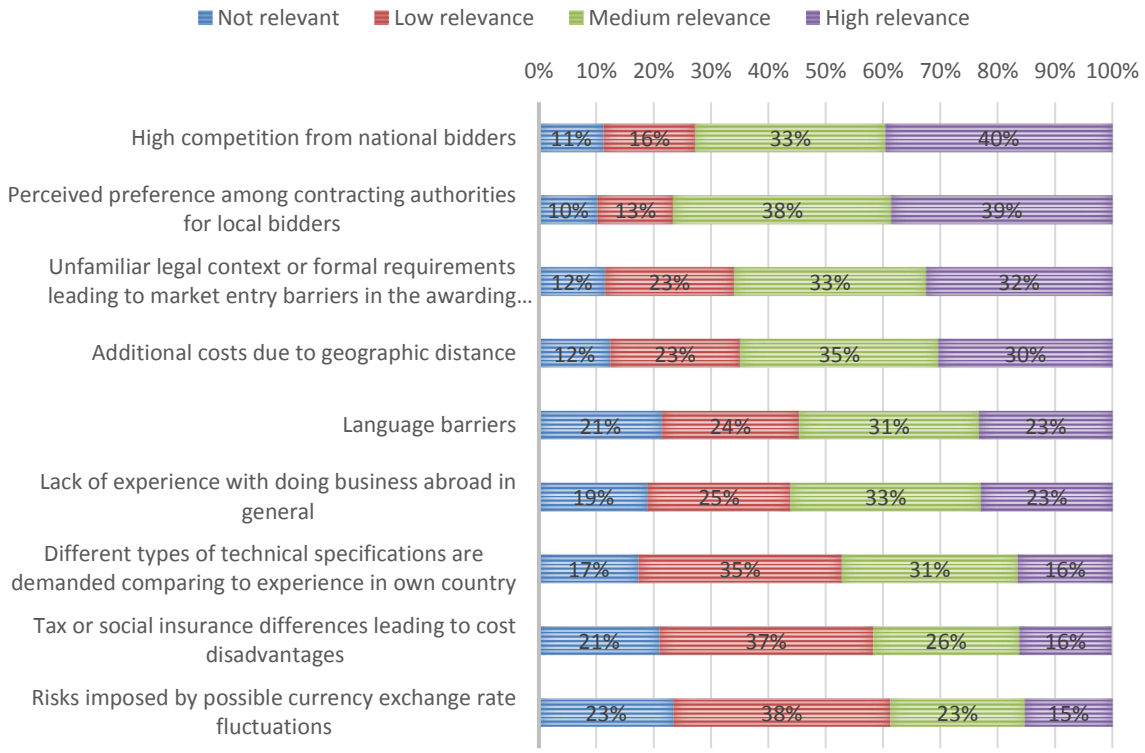
In the course of the survey, businesses were asked how relevant the following factors are in hampering their participation in cross-border public procurements.

The following graphs show that 'high competition from national bidders' is the option that the majority of respondents (40%) noted to be of 'high relevance'.

However, 'Perceived preference among contracting authorities for local bidders' was assessed by respondents as the most hampering factor: 39% of the business surveyed assess it of 'high relevance' and a further 38% assess it as 'medium relevance'.

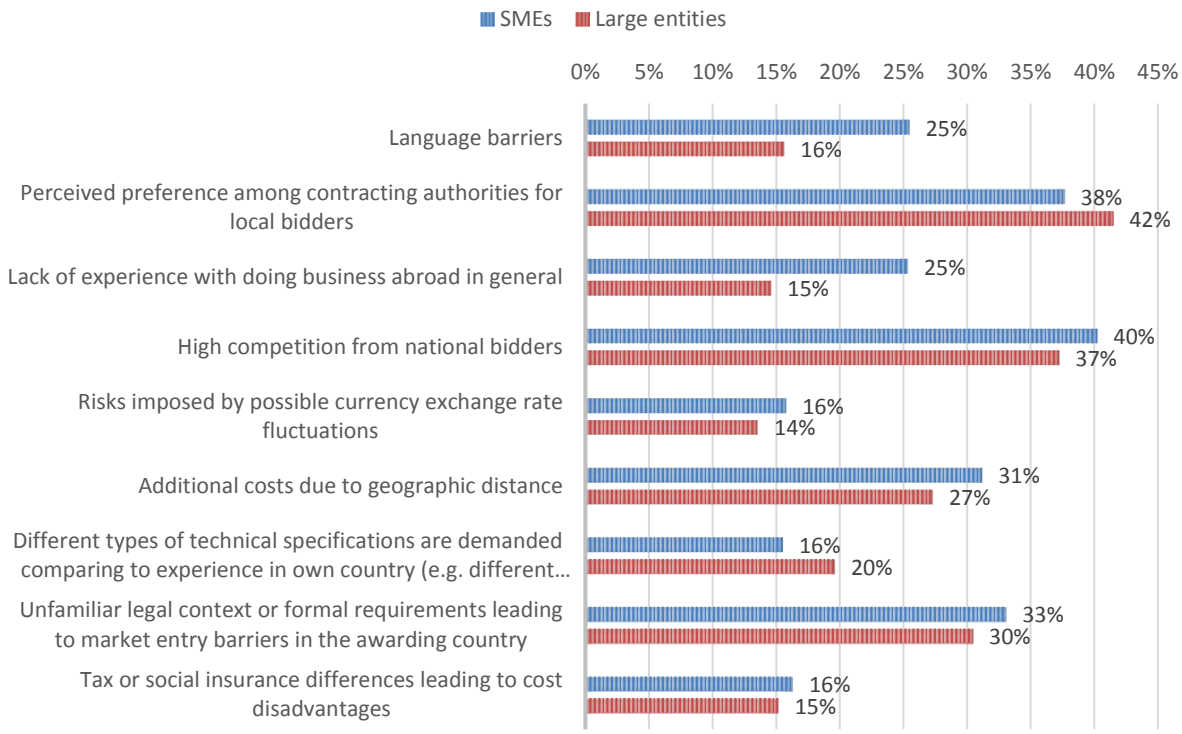
Figure 33: Barriers to cross-border public procurement

To what extent do the following factors create barriers to cross-border public procurement?



The following figure shows the share of respondents evaluating the above factors as '*highly relevant*' broken down by company's size (SMEs vs. Large companies).

Figure 34: Barriers to cross-border public procurement – by company size



The figure above shows that some barriers are more relevant for SMEs and others are more relevant for large entities. For example, SMEs regarded that:

- 'Language barriers';
- 'Lack of experience with doing business abroad in general';
- 'Additional costs due to geographic distances'; and
- 'Unfamiliar legal context or formal requirements leading to market entry barriers in the awarding country';

as more relevant factors (relative gap greater than 3%) barriers to cross-border public procurement.

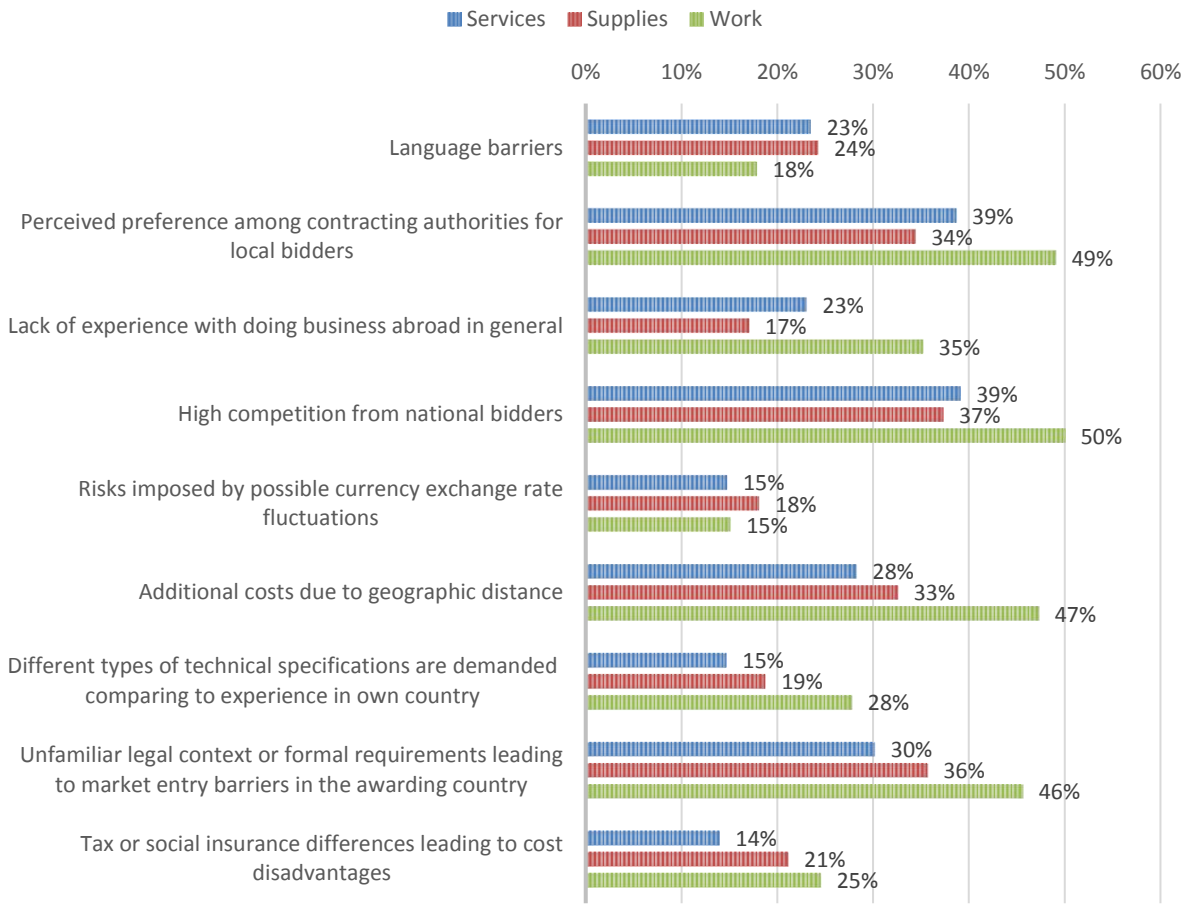
In contrast, large companies regarded that:

- 'Perceived preference among contracting authorities for local bidders'; and
- 'Different types of technical specifications are demanded comparing to experience to own country';

as more relevant barriers to cross-border public procurement.

There are indications from our case studies that this result can be explained by the different (human and financial) resources available to smaller and bigger companies (sometimes large entities have reported to have an in-house department dedicated to bid for public procurements – please refer to the '*Dun Laoghaire Institute of Art Design & Technology (Ireland)*' and to '*Carpenter works for a regional road administration building in the district of Flachgau (Austria)*' case studies) and/or the different types of tenders that large companies are involved compared to SMEs.

Figure 35: Barriers to cross-border public procurement – by services/ supplies/ works



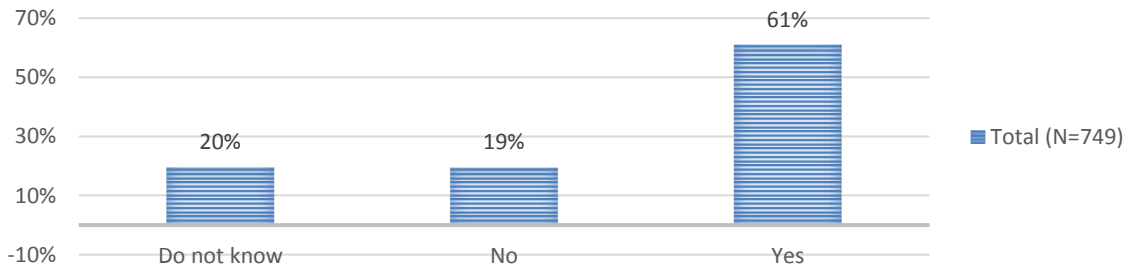
The risks identified appear to be highly relevant for the enterprises operating in the fields of works, given the high predominance in all the categories, exception made for 'Risk imposed by possible currency exchange fluctuations' and 'Language barriers' that are considered more relevant for companies operating in 'Services' and 'Supplies'.

4.1.4. The costs of tendering cross-border

In the last part of the survey, businesses were asked about the costs of tendering cross-border. The following graphs show the results of businesses perception of the relative costs in bidding abroad compared to bidding domestically. Figure 36 shows that 61% of businesses agree that bidding cross-border is generally more expensive than bidding domestically.

Figure 36: The costs of bidding cross-border

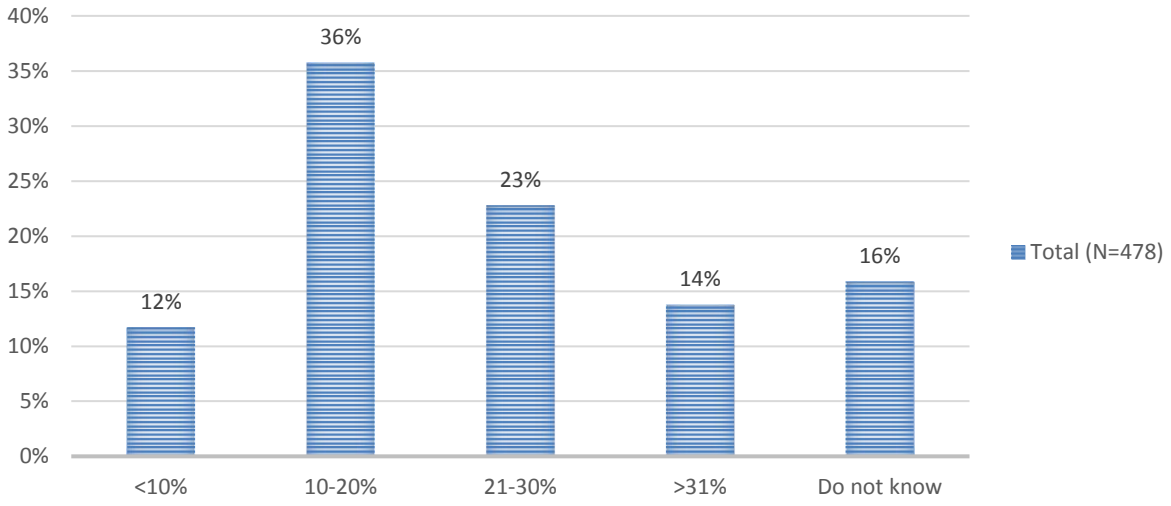
Is bidding for cross-border public procurement tenders more expensive than bidding domestically?



Businesses were also asked to assess the extent to which cross-border public procurement is more expensive than bidding domestically. 59% of companies indicated that cross-border public procurement by 10% to 30%.

Figure 37: Assessment of the costs of bidding cross-border

To what extent is bidding for cross-border public procurement tenders more expensive than bidding domestically?



4.2. The contracting authorities' perspective

The previous chapter looked at businesses' experience on cross-border procurement. This chapter instead focuses on the contracting authorities' perspective.

We carried out telephone interviews to acquire a better picture of demand side factors that influence cross-border procurement. The outcome of this analysis is a set of 10 case studies with individual contracting authorities and the respective economic operators, when possible.

The 10 case study countries are drawn from 28 Member States and are based on relevant cross-border procurement patterns as identified in Table 23 and Table 24 (i.e. cross-border penetration).

The following business relationships are covered:

- Austrian contracting authority – German contract award winner;
- Belgian contracting authority – Dutch contract award winner;
- Danish contracting authority – Swedish contract award winner;
- Estonian contracting authority – German contract award winner;
- Spanish contracting authority – Dutch contract award winner;
- Irish contracting authority – British contract award winner;
- Italian contracting authority – French contract award winner;
- Polish contracting authority – British contract award winner;
- Romanian contracting authority – Italian contract award winner;
- Slovakian contracting authority – Czech contract award winner.

The case studies are informed by 47 interviews. The table below provides an overview on number of interviews conducted and the type of interviewees (public authority versus companies).

Table 52: Overview table of the interview conducted

Case study	Nr. of public authorities interviewed	Nr. of companies interviewed
Austria – Germany	4	1
Belgium – the Netherlands	7	1
Denmark – Sweden	5	1
Estonia – Germany	1	1
Ireland – United Kingdom	4	2
Italy – France	3	2
Poland – United Kingdom	1	1
Romania – Italy	2	1
Slovakia – Czech Republic	7	1
Spain – the Netherlands	2	0
Total	**36**	**11**

All case studies consider cross-border public procurement based on views from both sides – public authorities awarding and managing contracts and companies bidding and winning these contracts. Almost each case study (except Spain and Belgium) is based on a matched relationship – where we consulted public authority which awarded contract A and with a company which won contract A. In one case study between Spanish authorities and Dutch companies, we did not manage to gather views from any company and in Belgium, we did not base the case study on a 'matched relationship' but instead we gathered views from many interviewees (public authorities and companies) participating in cross -border procurement. Overall, we conducted more interviews than initially proposed in order to gather additional insights from the experience of other public authorities/companies and to collect potential recommendations. In general, public authorities were more willing to participate in the interviews. Most of the companies which were contacted declined the participation due to *inter alia* lack of time, limited experience in cross-border public procurement, companies switching sectors, companies seized operations, mergers and acquisitions, individuals responsible for contracts in question changed jobs. Besides, the level of details of each case study largely depended on the responses we received from the contacted stakeholders, their willingness to share relevant information and the quality of data available through desk research.

We have used the interviews with public authorities to examine drivers and barriers to cross-border public procurement. We have also explored the competitive advantages of companies located in Germany, UK, France and the Netherlands as these countries display relatively higher shares of direct and indirect cross-border contracts (as identified in Table 23 and in Table 24).

4.2.1. Carpenter works contract for a regional road administration building in the district of Flachgau (Austria)

Short introduction: According to Austrian public authorities, German construction companies are awarded with Austrian EU-wide public procurement work contracts more often due to a number of factors:

- First, their close proximity to Austria generally gives German companies a higher ranking with regards to the ecological and sustainability criteria by virtue of engendering shorter supply chains and thus reducing the ecological footprint of the associated works.
- Second, German construction companies are reported to be generally larger than those of many other adjacent countries, reportedly making German construction companies more experienced in cross-border bidding, more apt to tackle large-scale construction projects as well as more effective in identifying and managing suitable sub-contractors.
- Third, Austrian public authorities highlighted that some German construction companies have successfully specialised in providing niche technologies and specific construction operations, with their specific expertise strongly reducing the relative degree of competition from rivals based in other EU countries.

Several interviewees highlighted that there is a clear correlation with linguistic familiarity. As all of the public authorities interviewed exclusively publish information on EU-wide public procurements in German, and since they furthermore require German-speaking staff to be deployed for the work/service at hand, the fact that the contractors speak the same language as

the public authorities plays a tangible role in the awarding of contracts.

Description of the works contract: in August 2011, under a European-wide public procurement procedure, the state building administration ('*Landesbaudirektion*') of the region of Salzburg launched a tender for construction and carpenter works for a regional road administration building in the district of Flachgau. The building administration published 80% of the contract's value in lots in the framework of a European-wide public procurement procedure. One of these lots comprised the entirety of the carpentry works related to the larger construction project. The applications were evaluated based on criteria such as: economic, legal, ecological and social inclusiveness factors. The contract was awarded to a German construction company Grossmann Bau GmbH & Co KG. for a price offer of 1,016,316.5 €.

Interviewees: Landesbaudirektion Salzburg and Grossmann Bau GmbH & Co KG representative responsible for the implementation of the contract. Additional interviews with public procurement officers from: Land Vorarlberg, Fernwärme Wien and Magistrat der Stadt Wien – Abfallwirtschaft.

Views of the companies*:* the company Grossmann Bau GmbH & Co KG embraces bidding for EU-wide public procurements as a fundamental diversification practice, with public procurements accounting for over 70% of their annual turnover. Although contracts awarded by public authorities outside of Germany reportedly only account for ca. 3% of their annual turnover, they have a designated staff member regularly checking for relevant EU-wide tenders. As such, bidding for the procurement published by the Landesbaudirektion Salzburg in 2011 was '*part of normal procedures'*. Grossman Bau highlighted that amongst all EU countries targeted, it has generally been most successful in winning public contracts in Austria. It has ascribed this relative success both to their geographic proximity and to the absence of any linguistic and cultural barriers.

Views of the public authorities: According to the public evaluator in charge, the motivation for tendering Europe-wide was not only driven by legal constraints, but also by market considerations. By tendering Europe-wide, the Landesbaudirektion Salzburg was hoping to attract additional bidders, and thereby to increase competition, enhance quality and reduce costs. With the tender information being published solely in German, the building administration received 6 offers from German and Austrian companies by the submission deadline. According to the evaluator, the works were completed successfully, in time and in full compliance with all contractually stipulated requirements.

Conclusions: interviewees suggested that the '*pre-qualification system*' (Präqualifikation), as is implemented in Germany and Austria, should be expanded to a Europe-wide level. As such, a given company interested in pursuing cross-border public procurement would need to send the required documents to a centralised public accreditation entity and would then, if successfully accredited, receive a '*prequalification number*' that could be used for a certain time period (e.g. 1 year) to drastically simplify cross-border public procurements. In this system, when bidding for a specific tender, the company would ideally only need to indicate the price and the prequalification number to the public authority in question**.**

4.2.2. Why Dutch companies are so successful in Belgian public procurements? (Belgium)

Short introduction: There are several examples of cross-border procurement between Belgian authorities and Dutch companies. The geographical proximity and, often, a common language definitely facilitate and improve the process.

Description of the contracts: In 2015 the Federal Agency for the Safety of the Food Chain awarded a contract to a Dutch company for the destruction of chickens and poultry affected by avian flu. According to the interviewee, Dutch companies are well-known in the field and indeed, out of 3 competitors, two were Dutch. Another interesting example is represented by the Belgian Nuclear Research Centre, a foundation of Public Utility, active in very specific domain. The products/services required may often not be easy to find in the national market. For example, the Centre awarded a contract (around EUR 400,000) to a Dutch company to supply and install animal housing facilities for the laboratory. Only two offers were received, both from the Netherlands. This was expected by awarding authority, since Dutch companies are very

active in this type of sector. A Province in Flanders also experienced a similar situation for a contract to identify a company acting as an energy aggregator. This is a relatively new business and, according to the interviewee, there were no Belgian companies able to provide the service (two offers were submitted both from Dutch operators). Moreover, in 2014, Verko, an inter-municipal association for the collection of waste, awarded a tender to the Dutch company (for more than EUR 1,300,000). The purpose of the tender was to find a contractor who buys and recycles the paper and cardboards collected by Verko. The winner company offered a better price (weighted 65%) but also employed a better technology in the recycling process in comparisons to the 5 Belgian competitors. The technological aspect and the equipment used were indeed part of the evaluation criteria. Similarly, IOK, a public door-to-door waste collection company, awarded a contract to a Dutch company. Due to the depreciation rate of the recollection trucks, almost each year an open tender is issued for their replacement, in order to have always an upgraded truck fleet. In its experience, the Dutch winner presented a better price and more innovative solutions in comparison to national competitors.

Interviewees: Federal Agency for the Safety of the Food Chain (FASFC), officer. Federal Public Service Environment, officer. Verko, head of waste management. Belgian Nuclear Research Centre, Head of Purchase. IOK Afvalbeheer, Logistics Department. Flanders Province, Logistics Department. De Lijn, purchase officer. Vactec, owner.

Views of the public authorities: Public authorities noted that an important factor to open the tender to foreign bids is the absence or limited availability of the expertise needed at national level. It might be the case that some specific technology is needed and can only be supplied by foreign companies. Belgian authorities are likely to be aware of the national market limitation, so they try to ensure foreign bidders' participation. For example, this can be done in the publication phase of the contract notice. For instance, De Lijn (Flemish public transport company) tends to always to *publish in TED, even if not legally obliged*, to increase the operators' awareness. In some cases, the publication in official journals (European and national) is supported by *email notification or phone calls* to companies known to be active in the field (some organisations[52] published the *tender documents in English*). The opening up of the procurement is not always determined only by a lack of national expertise but by the possibility of increasing the competition to have a better choice in terms of quality and price of the offers thanks to a higher number of bidders (e.g. the Verko and IOK cases mentioned above). It has been reported by the public authorities that dealing with foreign companies can create administrative issues. In particular, the verification of administrative documents (e.g. certificates declaring that the companies have no debt with the tax authority or no bankruptcy proceedings) is more resource burdensome[53], since some of the certificates may not exist in the country of origin. During the evaluation of contracts, it may be needed to go on site to test the products (this happened in the case of IOK and Federal Agency for the Safety of the Food Chain). The perception of the contracting authorities is that these additional efforts are counterbalanced by the better quality and/or price of offer received and to the fact that usually the related costs are negligible in comparison to the total value of the contracts. A more serious issue, shared by almost all the interviewees, can be represented by the language[54]: in some circumstances, it is crucial that no misunderstandings can be generated due to the technical nature of the contract (e.g. in some of IOK contracts) or due to safety reasons (e.g. Belgian Nuclear Research Centre). In the implementation phase of the contracts geographical distance may also play a role. Some contracts require fast delivery and/or response and/or intervention that are more easily provided by closer economic operators. There was a common agreement among the interviewees that these difficulties can be overcome in the case of Dutch contractors since they are geographically close, they speak the same language[55] and the administrative document verification is straightforward. The interviewees reported that economic operators apply different strategies to minimise frictions and reinforce the position in Belgium and these include: creating synergies with a Belgian partner/subcontractor; operating through a Belgian agent and or representative; or creating a legal entity (in the Flanders Province case, the Dutch

52 Common practice for Belgian Nuclear Research Centre and for Federal Public Service- DG Environment- International Cooperation Team- Climate Change Unit.
53 According to the Federal Agency for the Safety of the Food Chain, Belgian Nuclear Research Centre and one organisation in Flanders Province.
54 It is worth mentioning also the obligation for contracting authorities to publish the notice only in Dutch (Flemish authorities) and in Dutch and French (for Federal entities). However, almost all the contracting authorities interviewed are able to answer to clarifications in English, French and German and some allow the presentation of offers in English (e.g. IOK and Federal Public Service-DG ENV) or in English with attached a Dutch translation (e.g. Verko).
55 Flemish contracting authorities have the same native language and Federal authorities speak both Dutch and French.

company created a Belgian branch to take over the contract). Those solutions are also useful to tackle the administrative burdens created by Belgian e-tendering and e-signature systems. For instance, the contracting authorities explained that e-tendering, despite aiming to simplify the process, may be counter effective representing a burden in terms of time and cost. And it may be not worthy for a foreign SMEs to comply with the system if it participates only sporadically to Belgian procurement.[56] In addition, e-signature is possible only by using a Belgian ID and this creates a barrier to foreign companies.[57]

Views of the companies: the interviewee sees cross-border procurement as an opportunity to increase and diversify its turnover. For instance, cross-border procurement represents roughly 40-50% of the turnover of Vactec BV, a company that designs and supplies systems and components for the evaporation of thin films materials on the surfaces.[58]

Conclusions: In Belgium, public authorities benefited from cross-border procurement by getting products, expertise or technology that were absent or had limited availability in their country. In addition, the opening of competition in some cases had a positive effect on the price. Relations with Dutch companies are facilitated by the geographical proximity as well as a common language (in particular for Federal or Flemish authorities). Finally, economic operators apply strategies to ease the process (e.g. they have a Belgian partner/subcontractor or a Belgian agent/ representative).

4.2.3. The Københavns Kommune - Menigo Foodservice AB (Denmark)

Short introduction: There are extensive cultural and historical links between Denmark and Sweden. Denmark and Sweden are jointly part of the Nordic Council, a geo-political inter-parliamentary forum for co-operation between the Nordic countries. This strong union is also reflected in business: most interviewees have reported a growing integration within Norway, Sweden and Denmark, where companies have one headquarters in one country but they operate across borders. In addition, the Scandinavian languages (Norwegian, Swedish and Danish) are mutually intelligible making communication easier. This strong interconnection leads to less cultural barriers and facilitates the business exchange. Public procurement in Denmark is conducted primarily at the local level, whereas the central government and the regions have a lower share of procurement.

Description of the contract: In 2011, Københavns Kommune (municipality of Copenhagen) launched a tender for the supply of food and beverage for schools', kindergartens' and other public institutions' canteens run under the supervision of the local administration. The tender was split in 21 lots reflecting different food and beverage products to attract potential bids from SMEs and Micro enterprises. A market dialogue was also organized prior to the launch in order to explain the scope of the contract and allow potential bidders to ask clarification questions. The tender notice was published in udbud.dk (the national public procurement portal managed by the Danish Competition & Consumer Authority) and TED, and the materials were submitted in Danish. The lot providing the supply of sliced fruits and vegetables (ca. 20% of the total compound value) was awarded to Menigo Foodservice AB, a Swedish company.

Interviewees: Københavns Kommune (municipality of Copenhagen) procurement officer and Menigo Foodservice AB representative responsible for the implementation of the contract. Additional interviews with public procurement officers from: Aarhus Kommune, University of Aalbrog, Odense University Hospital and Statens Serum Institut.

Views of the company*:* Menigo Foodservice AB is the second largest foodservice provider in Sweden, with public procurements (both domestic and cross-border) counting 40% of its annual turnover. Menigo had already an extensive experience in bidding for public tenders. At that time Menigo Foodservice was looking for a potential way to enter the Danish market and it embraced this opportunity as part of the company's expansion strategy. The decision to bid for this tender was also driven by the possibility to leverage the organic assortment of fruits and vegetables that Menigo had in stock. A relatively small issue was reported by the company and by the

56According to the Belgian Nuclear Research Centre and the Federal Agency for the Safety of the Food Chain.
57 According to one organisation in Flanders Province and the Federal Public Service-Environment.
58 In particular, design and installation of a new evaporation system into an existing glovebox in a laboratory, including PLC control and software. For more technical details please see http://www.vactec.nl/projecten/.

public authority and it was related to the different invoice systems in use in Denmark and in Sweden that at the beginning caused delays in payments.

Views of the public authorities: The majority of Danish public officers interviewed agreed that opening EU-wide tender brings benefits in terms of quality and price for the public administration. EU tenders are also perceived as a more complicated process than launching a national tender. In addition, sharing knowledge has been reported as a potential way to incentivize and promote best practices among public officers. In Denmark, once a year a national conference is held to share views on food procurement, where public officers are invited to participate to share their experiences and ideas on the topic. Similar international practices occur in the context of ICLEI[59] and INNOCAT[60], of which the Københavns Kommune is a member. Both organisations organize conferences on food procurement to provide new ideas, exchange practices and learn from each other with the aim to promote more sustainable food procurement. Similar practices may be beneficial also to spread knowledge in the context of cross-border public procurement.

Conclusions: According to the tender evaluator and the company representative, the food supply went smoothly, despite initial communication problems between the Danish canteen staff and the Swedish supplier. The interviewees reported that this experience was beneficial as it represented a good opportunity to learn how to *'do-business-abroad'*, given that also the municipality of Copenhagen did not have an extensive experience in dealing with foreign partners.

4.2.4. A pipe organ for Tartu Saint Paul´s church (Estonia)

Short introduction: In Estonia, the State can grant status in public law to large churches. This is the case of Saint Paul church in Tartu. In 2009, the church, built in *Art Noveau* style, needed a new and custom-made pipe organ.

Description of the contract: For this reason, a competitive dialogue procedure was opened to procure the pipe organ. The new pipe organ had firmly to be based on inspiration from classical organ building as well as romantic traditions in Germany, Scandinavia and Estonia of the 19th and 20th century. To ensure a wide reach of the qualified companies able to meet the requirements, the tender was published in the European Official Journal (also to fulfil legal obligations relative to contract above thresholds). Five offers were received from the expected countries and three of them were preselected to undergo into further negotiations. The value of the contract was around EUR 900,000. The contract was awarded to a German SME, and it took about one year and two months to build the component in Germany and around 8 months to finish it and install it in Tartu.

Interviewees: EELK Tartu Pauluse kogudus, Board Member responsible for the tender. German SME winner of the contract, Owner.

Views of the Public authority: Since the church administration was not aware of which companies could have had the expertise to provide the desired custom-made musical instrument, a pool of consultants was hired to explore the market and identify potential suppliers. It was identified that the expected builders would likely to be found in Germany, Switzerland, Sweden and Finland. Taking into consideration the research results of the consultants, some companies were personally invited. Finally, the tender documents were provided in English to ensure a wider participation of foreign companies and since no Estonian company was expected to bid. Five offers were received from the expected countries and three of them were preselected to undergo into further negotiations. The evaluators visited the organ builders' facilities and the companies were invited to visit the church. This made the costs of the procedure slightly more expensive, but considered by the contracting authority as *reasonable* compared to the value of the contract.

Views of the companies: The winner company, which could send his offer in German, has been quite active abroad (mainly in Finland, but also in Norway) in the last 20 years: around 70% of its contracts have been cross-border, while 30% are in Germany. According to the

59 ICLEI - Local Governments for Sustainability is global network of more than 1,500 cities, towns and regions.
60 INNOCAT is an international group of public and private buyers that aims to encourage eco-innovation in the catering sector.

owner, at the moment, it is quite difficult to make business in Germany, where the churches are private and subjected to different kind of procedures. Participating to tenders abroad, especially in Finland, is not considered *excessively* burdensome. The company has gained experience over the years and is aware of which kind of administrative documents are needed and which German authority must be addressed to get the necessary certificates (in order to meet the requests of the foreign contracting authority). Cross-border procurement represents a good opportunity for the company, which often collaborates also with two Finnish freelancers. This helps to reduce potential communication problems due to language barriers.

Conclusions: the unavailability of the product in the contracting authority's country was the main determinant to open the procurement (in this case even more relevant than mere compliance to the law). In addition, the flexibility of the contracting authority (publication of tender documents in English) clearly facilitates the participation of foreign economic operators. On the other hand, also the long-term experience of the winner company in cross-border tenders, especially in dealing with administrative requirements, has definitely contributed to make the process easier and less burdensome.

4.2.5. Dun Laoghaire Institute of Art Design & Technology (Ireland)

Short introduction: The Irish Dun Laoghaire Institute of Art Design & Technology (IADT) needed a new broadcasting studio in order to improve their television studio. After extensive research, the IADT decided to invite a selected group of companies to bid in a restricted procedure, all of them trusted multinational companies. Despite an initial attempt to issue a tender supporting SMEs[61] participation, the administration realized that there were no potential local or foreign small companies satisfying their requirements. Consequently, the tender had to be allocated to a cross-border multinational.

Description of the contract: The estimated value of the supply and installation of the broadcasting studio was approximately EUR 2 million. For that reason, it was published in the Irish eTenders[62] website and automatically redirected and published as well in the EU TED platform. It was a two stages process, where five companies expressed interest on the tender, four companies were invited and only three finally tendered. The awarded company was from the UK, even though the two other bidders were from Ireland. There were three main considerations in awarding the contract, the price 40%, the quality and the type of equipment meeting the specifications 30%, and quality of the after-sale service 30%. The awarded company was not the cheapest option. The installation of the equipment lasted 6 months after the awarding. There were no problems reported by any of the involved parties and there were no additional barriers related with the cross-border procurement. Moreover, the language used in the whole tendering process was English, official language in both Ireland and the United Kingdom.

Interviewees: Officer in charge of the procurement procedures from Dun Laoghaire Institute of Art Design & Technology. Officer in charge of the procurement procedures from Gearhouse Broadcast Limited.

Views of the companies: Gearhouse Broadcast Limited is a multinational company well-known for supplying high quality broadcast equipment and production facilities. Cross-border procurement is part of its every-day business; hence it was easy for them to find the opportunity in the European TED website and to obtain relevant information. The company was aware of the criteria the IADT was looking for and they were sure of their possibilities to meet these requirements. The reliability of the company and their competitive pricing represented their key strength points to win the tender. However, after years of experience, they know that offering only the lowest price is not successful in most of the cases, the offer should represent the "best value for money". In addition, the opportunity to show their expertise and products in Ireland was an extra motivation that pushed them to work more efficiently. The company reported that bidding in Ireland was like bidding for a national procurement (no additional administrative costs), whereas this 'smoothness' is difficult to find in other European countries

61 The Irish Government encourages to attract small companiesn and suggests public authorities to avoid the creation of barriers (e.g publish smaller lots, etc.).

62 The national procurement website managed by The Office of Government Procurement (OGP) http://www.etenders.gov.ie/.

where administration costs sometimes represent a market barrier difficult to overcome.

Views of the public authorities: In the IADT some of the procurement contracts are awarded nationally, but there are many others published and awarded at EU level. The main reason to publish at EU level is related to the fact that the compound value of the contract is above the threshold and that the eTenders website publish it automatically on EU TED. Moreover, eTenders received positive comments from all the contracting authorities interviewed. Besides, in IADT's and the other public authorities' experience, the quality of services tends to be higher when opening bids cross-borders as foreign companies try to establish a strong reputation in the local market.

Conclusions: The Irish contracting authorities and the Government have worked in order to support the cross-border procurement. In that sense, several public authorities are used to receive tenders from the UK and other EU countries, which normally creates no extra costs compared with a national procedure. In addition, the centralisation of the tenders in a single website where the contracting authorities and economic operators interact have improved the traditional functioning of the procedures. Both operators highlighted the eTenders ease of interaction, as well as its simplicity to observe and upload tenders' information. Additionally, the interviewees explained that two factors may facilitate the cross-border bidding between Ireland and the UK: the use of the same language, and the similarities of the public procurement systems in both countries.

4.2.6. Hi-tech equipment for the education sector (Italy)

Short introduction: Italian schools and universities are subjected to public procurement rules to procure products or services they need. The similar experience of two contracting authorities (one school and one university) is presented below. Both cases refer to contract for hi-tech equipment that is not available in the national market and show how the contracting authorities dealt with it.

Description of the contracts: The *'Istituto Tecnico Industriale Statale G. & M. Montani'* (State Industrial Technical Institute), a high school located in Fermo (Marche Region, Italy) issued in 2014, the invitation for a restricted procedure to supply a simulator of ship decks for the laboratory, with fully equipped educational stations including radar stations and simulated bridge deck, a module dedicated to the planning of operations of environmental protection from potential pollution caused by human activity in the sea. The tender notice was published on: The European and Italian Official Journal, 2 national and 2 local newspapers, the website of the Ministry of Infrastructure as well as the school website (as foreseen by the Italian law[63]). Two offers were received, both from French companies: Transas and another company that operates in the sector. Similarly, the University of Salento (*Universitá del Salento*) needed scientific and technical equipment in the context of the framework agreement called 'Scientific Research' - Research public laboratory networks – Project 'Green engine' (around EUR 750,000 excluding VAT). Particularly, Lot 4 of the contract (that was divided into 6 lots and awarded through an open procedure in 2010) dealt with the supply of a thermal property analyser for the laboratory of Ceramics Materials. A French company was the only bidder and got the contract.

Interviewees: Istituto Tecnico Industriale G. e M. Montani, officer in charge of the procurement procedure and Transas Mediterranean, sales manager responsible for the implementation of the contract. Other interviewees: Universita' del Salento, officer in charge of the procurement procedure.

Views of the companies: One of the issues faced by economic operators is that Italian schools are subjected to limitations with international transfer payments and international invoices. 2008 Financial Law states that public administration must use *'e-invoices'* system, which in turn requires the economic operators to go through a registration and accreditation process in order to be eligible for the payment. In addition, the *'Anti-Mafia'* legislation requires the provision of additional documents to prove the identity of the supplier's legal representatives in order to avoid infiltration in public procurement and this can create an obstacle for companies not familiar with the Italian requirements. Transas deliberately established a branch in Italy to

63 Codice dei Contratti Pubblici (Code of Public Contracts).

overcome these types of issues with public administration and to be better prepared to comply with administrative requirements. Indeed, the participation to the tender mentioned above was coordinated by Transas Mediterranean - the Italian branch. The interviewee explained that other economic operators apply this strategy for the Italian market (e.g. the competitor company participated through the Italian branch to the tender too).[64] This helped to simplify the process in several ways. Finally, the use of the same language avoids misunderstandings and the need of translation. Transas submitted the proposal in Italian (even though it was legally possible to submit it in another language with the Italian translation attached).

Views of the public authorities: Due to the peculiarity of the equipment needed in both cases (not available in the national market and produced by few companies in the EU and worldwide), the contracting authorities made sure to publish the contract notice on the EU official Journal not only to fulfil legal obligation, but especially to ensure the participation of the qualified bidders. To guarantee a good level of awareness and the involvement of key actors, the Montani Institute released also a pre-information notice one year before. In both cases the contracting authorities agrees that dealing with a foreign company can lead to additional administrative costs (e.g. more complicated to get certificates to check the administrative requirements and/or to test on site the equipment),[65] but in general they are negligible and counterbalanced by the better quality and price of the offers received. Moreover, the Montani institute explained that this supply was quite exceptional since it usually procures simpler and standard products (e.g. computers and laboratory materials). The administration generally deals with national suppliers with a different type of procedures (e.g. the so-called 'cottimo fiduciario', simplified procedure foreseen by the Italian law for contracts worth less than € 40.000 allowing negotiation and awarding without call for competition). On the contrary, the University, that is more involved in cross-border cases than the 'Montani' Institute, highlighted that the burden of the publication costs, that are on the winning tenderer (in the case mentioned above they were around EUR 3,000 for a contract of EUR 24,000), is another reason that can discourage foreign economic operators (as well as the contribution to the Anti – Corruption Authority for contracts above EUR 40,000).

Conclusions: in the cases analysed, the burden of cross-border procurement seems to be more on the bidders than on contracting authorities due to the administrative burden required by Italian system. The economic operators try to overcome these difficulties by establishing branches in the country.

4.2.7. The revitalisation of the Vistula river (Poland)

Short introduction: City of Warsaw carries out a comprehensive program of revitalization of the Vistula river in Warsaw. Its main purpose is to bring the citizens closer to the river by renovating public spaces and by building new spaces of common interest.

Description of the contract: In 2011, the City of Warsaw launched a tender for the supply of technical assistance linked to the revitalisation of the Vistula river. The technical assistance, notably architectural, construction, engineering and inspection services was sought through an EU-wide call for tender due to its estimated value. Through the first call of tender no contractor was selected. The city of Warsaw re-launched the same call but on this occasion no offers were submitted. Finally, in 2012, the city of Warsaw engaged in a competitive dialogue with one pre-selected company and finally an agreement was reached. Halcrow Group Limited based in the UK was selected to provide technical assistance at the price of EUR 230,605.54.

Interviewees: City of Warsaw, a policy officer responsible for the implementation of the contract. CH2M (previously Halcrow Group Limited) project manager responsible for the implementation of the contract.

Views of the companies: The interviewee indicated the company often participates in cross-border public procurement, so this specific contract was not a novelty for the team. The offer was coordinated and submitted from an UK based office, but the company has an office in

64 Another interviewee confirmed that this behaviour is extremely common also for companies operating in the Health sector, where the presence in the country is not only important for the tendering process, but also for the implementation of the contract.

65 The evaluation board had to go to France to test the software in the Montani case.

Warsaw which was designated to fulfil the contract. It was noted that the particular contract is of specific nature - the contract had to be renewed several times, every year since it had been awarded. In addition, Halcrow Group Limited was bought by a different company CH2M, but the interviewee noted that the change of ownership did not affect the execution of the contract. The interviewee noted that cooperation with the city of Warsaw is extremely successful. The public authority is very understanding of the problems that C2HM is coming across, such as, access to information, issue of certificates etc. and that these problems are outside of the contractor's competence. In general, the administrative procedures in Poland are very lengthy and the contractor came across many obstacles which were not foreseen at the beginning.

Views of the public authorities: The interviewee reported that this experience was beneficial as it represented a good opportunity to learn how to '*do-business-with-companies-abroad*'. The policy officer noted that due to the value of the contract the tender needed to be open EU-wide, but back in 2011 the city of Warsaw did have a limited experience with dealing with foreign companies. Since the contract was finally awarded in the third round via a competitive dialogue, the public authority representatives had a chance to meet in person the future contractor and discuss particularities of the project. The interviewee noted that a possibility to have a personal interaction was of a big value and it increased confidence that the contract could be completed by foreign company but through an office based in Poland. The policy officer highlighted that local presence of the contractor is preferred especially in case of complex contracts as the revitalization of the Vistula in Warsaw turned out to be. The policy officer stressed that the ability of communicating with a contractor in Polish and for the contactor to be familiar with the nature of doing business in Poland was of added value. This was especially important in the provision of technical assistance, where the contractor has to deal with local authorities, administrative bodies, and courts.

Conclusions: even though the company engages regularly in cross-border public procurement in general and it has a branch in Poland, the unfamiliar legal context and formal requirements represented market entry barriers. The direct cooperation with the public authorities helped in reducing these administrative burdens. Both parties recognise a public interest in finalisation of the project and pursue in reaching the successful implementation, even if it fails outside originally agreed timeframe.

4.2.8. The International Centre "Constantin Brancusi" (Romania)

Short introduction: Romania constitutes an attractive country for foreign companies, since from the moment it joined the European Union, in 2007, new sources of funding have become available through European funding channels. Given that Romania needs to catch up with other Western countries, and has a considerable amount of infrastructure to develop, there are continuous opportunities for public procurements. Indeed, the sectors where public procurements are particularly common are: infrastructure, telecommunication, aviation, railway, and maritime, electric and thermal energy, as well as tap water distribution. In addition, the fact that the funding is provided through European funds guarantees the availability of the payments, and increases the attractiveness for companies to participate.

Description of the contract: the construction of the International Centre 'Constantin Brancusi'. The tender was launched by the Dolj Council in 2014, the total value of the contract was 5,384,411.64 € and it was sponsored by EU funds (approximately 50% of the total value of the contract).[66] The contract was awarded to consortium led by the Italian company, San Giorgio Appalti srl, in the framework of an open procedure. In the case of this centre the price counted 60%, the term of execution 30%, while the guarantee of quality of the work accounted for 10%.

Interviewees: Dolj Council procurement officer and San Giorgio Appalti srl representative responsible for the implementation of the contract.

Views of the companies*:* for San Giorgio Appalti moving the activity abroad was a business opportunity that rescued the company from its downturn. The Italian company had a subsidiary based in Romania, and participated in this tender with other Italian partners experienced in

[66] http://staredefapt.ro/a-fost-semnat-contractul-pentru-construirea-centrului-international-constantin-brancusi/ .

dealing with Romanian authorities. Therefore, it is relatively easy for the company to obtain information on appealing contracts and deal with the language barriers. The Italian company reported high positive feedback in doing business in Romania, particularly concerning the tax system, since Romania has one of the lowest corporate taxes in the world (16%). Moreover, the lower level of competition in comparison to Italy constitutes an attractive incentive to enter the Romanian market. Additionally, the interviewee gave an example of best practices, stating that many Italian companies conveniently choose to open subsidiaries in Romania in order to participate in public procurement and they use local staff in this process. The fact that many Romanians speak Italian only encourages this process.

Views of the public authorities: Concerning the public authority, contracts to foreign companies are frequently awarded, which potentially explains the fact that for the Dolj Council the procedure of evaluation is not deemed more complicated or expensive when foreign companies are involved. In this specific case the Dolj Council used tendering Europe-wide procedure given the value of the contract. The public authority benefited from an economic advantage, given the offer of the Italian Consortium, which allowed to save hundred thousands of Euros (around 700,000 €). It was suggested that the increased transparency of Romanian public institutions has incentivized the participation of foreign bids over the least years. Furthermore, the public officers interviewed were of the opinion that using EU-wide tender procedure brings benefits in terms of price for the public administration, since having more competitors involved dwindles the price. Moreover, a recent change in the law facilitated a decrease in the time of processing the documentation. Only the company which is awarded the contract needs to present the actual documents, whereas, during the competition stage, the companies present solely a declaration of liability related to the documentation requested. Previously, all bidders were requested to submit documents and bidders from abroad used documents in foreign languages which needed to be checked by the Romanian authorities.

Conclusions: This case study illustrates a successful example of cooperation between an Italian company and a Romanian public authority, with mutual benefits having been gained from the execution of the contract. The company was driven by an economic opportunity, and the corporate tax advantages obtained abroad, while the public authority was able to beneficiate from a more economically advantageous offer. The language and cultural similarities between Romania and Italy naturally add up to successful collaborations between the two countries.

4.2.9. Why Czech companies are so successful in Slovak public procurement? (Slovakia)

Short introduction: The Czech Republic and Slovakia share a common history throughout the majority of the 20th century. Even if the two Member States were separated more than 20 years ago, ties between them remain close. Companies operate on both markets under freedom to provide services without considering it a cross-border interaction. International companies usually establish themselves in one country managing both markets from one seat. This close relationship between the two Member States is also visible in public procurement. The Slovak market is relatively small and in some more specialised sectors there is a shortage, sometimes even inexistence, of national manufacturers and/or suppliers of products. These sectors include specialised equipment used by universities and other institutes for research, high-voltage electricity pylons or even office furniture.

Description of the contracts: Západoslovenská distribučná, a.s., an electricity distribution company, launched a public procurement procedure in 2014. This particular tender was advertised on TED and the tender bulletin of the Slovak Office for Public Procurement. The procurement procedure was divided into two lots. The first lot was for extreme-high-voltage pylons and three participants were shortlisted for it, a company from Hungary, Portugal and a Slovak branch of a Slovene supplier. The second lot, which is one of the subjects of this case study, was for high-voltage pylons through a restricted procedure. All companies that submitted a bid and that fulfilled the call for tender's conditions for the second lot went through to the competition part. The proposals were evaluated and were consequently submitted to an e-auction. The e-auction was won by a Czech company who in 2015 signed a framework agreement for four years, 2015 – 2019, for the second lot of the procurement procedure. The Czech company specialises in manufacturing, supply and installation of steel constructions including pylons and substations and their maintenance and repairs.

A Slovak university launched a public procurement procedure in 2014 for laboratory equipment. The procurement was divided into four lots for four different devices – a fermentation unit for half-dry fermentation (lot one); an instrument for measuring the density, opacity and alcohol level in liquids (lot two); a universal measuring system for electrochemical and spectrophotometric measurement of rapid processes at high current load (lot three); and a differential compensatory calorimeter (lot four). The second lot of the procurement was won by a Czech company that specialises in systems for production planning (ERP - Enterprise resource planning) and production control. The production of instruments is done either in-house or in cooperation with other companies. The contract was signed for five years and included maintenance and repairs of the device. The rest of the lots were won by Slovak companies.

Interviewees: Procurement expert of Západoslovenská distribučná, a.s. Additional interviews with public procurement officers from: eustream, VO SK, Slovak Academy of Sciences, Forests of the Slovak Republic, Comenius University, and Železničná spoločnosť Slovensko, a. s. Written response received from a Czech company that won the second public procurement contract described above.

Views of the companies*:* Czech companies have a history of participating in Slovak public procurement and just like the Slovak public authorities' side, do not consider bidding for Slovak contracts as a cross-border activity but an extension of the national market given that they are permitted to use their own language, meaning there are no translation costs, and the overall approach is very similar to the Czech one, therefore any possible language/cultural misunderstanding are avoided. The winner of the second procurement contract, for the instrument for measuring density, opacity and alcohol level in liquids found out about the procurement procedure through their marketing channels as participation in cross-border public procurement procedures is part of their business model as they see it as an added-value to the development of their know-how. In the interviewee's opinion, the assessment of the bids lasts longer in Slovakia than in the Czech Republic and the price factor is fundamental for the awarding authorities. The responses from the representative of the Czech company indicate that the contract with the university has been going well and there have been no delays or problems with the supply and maintenance of the device.

Views of the public authorities: The European legislation requires public authorities to publish their calls for tenders above a certain amount in the European database TED. This has been welcomed by Slovak public entities as this means a possibility of more applicants to their public procurements. Some foreign companies submit their application through their Slovak intermediaries, without this being a precondition. In some instances, where Slovak public entities are publishing a call for tenders for a specific equipment in TED and are expecting a number of foreign participants, they may indicate as one of the requirements that the winner of the contract has to have an agreement with a Slovak company or a company in geographical vicinity for repairs and maintenance. Sometimes, the public entities only require a workshop for their employees where the winner demonstrates the equipment and trains the employees. The Slovak public procurement law requires all proposals to be submitted in the Slovak language. Yet, Czech companies are often offered the "opportunity" to submit a proposal in Czech language, given the proximity/similarity of these two languages. Interviews showed that in many cases, Czech participants in public procurement are not considered "foreign". One problem that has been highlighted by stakeholders was that sometimes foreign companies are not familiar with requirements regarding acceptable documentation as required by the Slovak law which can in some cases lead to their disqualification if they are not willing to abide by it. An example was given where there was only one manufacturer in the world that could provide the specific good, however, this supplier did not understand why he should go through the public procurement procedure (required by Slovak law) rather than signing a contract straightaway. After publishing a call for tenders, some Slovak public entities do their own market research and contact companies that may be interested in participating with a link to the call for tenders or distribute the link to their suppliers. With regards to the costs, the public entities interviewed do not find the evaluation of cross-border public procurement costlier, however, in some instances it might take slightly more time to evaluate all the proposals. The procurement expert of Západoslovenská distribučná has not mentioned any problems with the implementation of the four-year-long framework contract.

Conclusions: Západoslovenská distribučná's public procurements are always open to foreign companies given that there is a very limited number of domestic suppliers. As this was not

the public entity's first cross-border public procurement, they do have some experience with "doing-business-abroad". Raising awareness is a tool to expand the pool of foreign contactors operating in the sector of interest (outside of the Czech and Slovak Republics), by contacting selected new companies with potential interest in future cooperation and to invite them directly to submit a proposal. In conclusion, cross-border public procurement between Slovakia and the Czech Republic is mutually beneficial for both sides. The driving factors for public authorities are often the shortages of domestic suppliers and the necessary experience in specialised sectors. Czech companies see the Slovak market as an opportunity to extend their business without too much "extra" costs. Complimentarily, both countries see the cooperation in public procurement as an extension of their home markets.

4.2.10. AENA Aeropuertos (Spain)

Short introduction: AENA Aeropuertos manages the Spanish air navigation. It is a public company under the supervision of the Ministry of Public Works, and it is responsible of the air traffic control, aeronautical information and communication, navigation and surveillance networks of the Spanish airspace. The company usually outsources most of the services and works. In general, the awarded contracts are won by companies located in Spain, or to foreign companies that have a Spanish subsidiary which is also in charge of the tender procedures. In 2012-2013, AENA launched a tender for the operation and maintenance of the integrated luggage system of the Ibiza Airport.

Description of the contract: Considering the specific and complex requirements of the maintenance, it was decided to use a negotiated procedure. The awarding procedure considered the technical quality of the services and there was a price limit indicated: bidders were required to reach a minimum score of 6 out of 10 points in quality to be evaluated for the "best price" criteria. The language used in the whole procedure was Spanish.[67] Four companies participated to the first step and were able to ask questions about the technical requirements. Furthermore, the participants were invited to the airport installations so they could measure and analyse personally these requisites. Nevertheless, only one of the tenderers overtook the minimum quality required and it was suggested to decrease the price offer from 376,000€ to 355,000€ to be finally selected.[68] The winning company was a Dutch company, one of the world's biggest multinational group for baggage handling systems for airports.

Interviewees: Officer in charge of the procurement procedures from AENA Aeropuertos.

Views of the public authorities: It is not common practice for AENA to have direct cross-border bidders. According to AENA's experience, multinational companies usually bid through their local subsidiaries. Since the official language used for the documents was Spanish, the companies bidding for the public procurement provided Spanish staff familiar both with the language and the laws. For these reasons, neither the evaluation costs nor the length of the procedures were altered. Even though in this project the Dutch mother-company was formally responsible for the procedure, the person in charge was an employee of the Spanish subsidiary, who had already worked in other similar procurement procedures with AENA.

Conclusions: Spanish public authorities normally publish tenders in Spanish and rarely translate them to other language. In addition, the translation is not legally relevant in case of litigation. For this reason, the multinational companies trying to enter the Spanish public procurement market use or create local subsidiary or as in this case bid directly but in Spanish (in-house Spanish language capability).

4.3. Summary of the findings from the survey and case studies

The survey results show that that the **public sector is an important client for most of the businesses surveyed**: about 58% of the companies had participated frequently in public

67 Depending on the market and the possible tenderers, the technical requirements of the tender might be published in English in order to invite specific companies. However, the translation of the specific juridical and technical terms makes the processes more expensive and time consuming. For that reason, the official language is always Spanish.

68 Similarly, in other case the Dutch company EBSCO bid above the maximum price in a tender from the Technical University of Madrid (UPM), and it was automatically excluded after the evaluation of the technical offer.

tenders both domestic and cross-border (more than 20 times in the past three years) and 56% of the participants generate more than 25% of their turnover from public sector clients. However, when **considering cross-border public procurement, the picture changes: 62% of the respondents claim that it counts less than 10%** and 38% of respondents said that have not engaged in cross-border tendering at all in the past three years.

In other words, even though most surveyed businesses engage regularly in public procurement in general, they rarely engage in cross-border public procurement and the success rate of the businesses surveyed is on average higher for domestic bids than for cross-border bids.
Based on the percentage distribution of our survey, businesses consider the following main factors as obstacles for bidding cross-border:

- 'High competition from national bidders' (40% of respondents perceived this as 'high relevant barriers');
- 'Perceived preference among contracting authorities for local bidders' (39%);
- 'Unfamiliar legal context or formal requirements (e.g. contract, labour law, certificates to provide such as special permits necessary for offering services abroad etc.) leading to market entry barriers in the awarding country' (32%);
- 'Additional costs due to geographic distance (i.e. implementation of contract is more expensive compared to delivery of contract close to own location)' (30%).

SMEs regard the following factors as more relevant barriers:

- 'Language barriers';
- 'Lack of experience with doing business abroad in general';
- 'Additional costs due to geographic distances'; and
- 'Unfamiliar legal context or formal requirements leading to market entry barriers in the awarding country'.

These results can be explained by the different (human and financial) resources available to smaller and bigger companies. In fact, during the case study interviews, large companies have reported to have in-house procurement departments.
Most of the businesses do not consider access to the relevant information a barrier hampering their participation in cross-border tenders, with the exception of micro enterprises (46%).
From the public authorities' point of view, two important factors are behind the decision to attract cross-border contractors:

1. The possibility of increasing competition and to have a better choice in terms of quality and price;
2. The current absence or limited availability of suppliers at national level;

Some public authorities reported that increasing the number of bidders provides benefits in terms of having a better choice, quality and price due to increased competition which in turn reduces public expenditure. For instance, in 2014 Verko, an inter-municipal association for the collection of waste in Belgium, awarded a tender for the collection of papers and cardboards to the Dutch company. The winner not only offered a better price (weighted 65%) but also employed a better technology in comparison to the 5 Belgian competitors.

The limited availability of suppliers at national level was found as a recurring issue especially for highly specialised public institutions (e.g. universities, hospitals) that need technical expertise. For example, the Italian technical institute *G. & M. Montani* reported that providers of laboratory simulator of ship decks are not available in Italy and there are only few suppliers worldwide, consequently cross-border public procurement is a necessity. The use of the negotiated procedure has been reported as common practice in these cases. In fact, as stated by Art. 31 of Directive 2004/18/EC, this procedure is justified '*…for technical or artistic reasons, or for reasons connected with the protection of exclusive rights, the contract may be awarded only to a particular economic operator…*'.

Public authorities noted that a market research before launching cross-border tender is a beneficial practice helping to understand if domestic companies can supply services, products or works. From a general admission by some public officers interviewed, there is lack of experience in '*doing-business-abroad*' and in mastering the procurement documents in another language. Clear communication has been reported as essential prerequisite in order to avoid any potential misunderstandings about the content of the procurement and this is considered a '*worrying*' aspect when dealing with foreign suppliers.

In addition, public authorities noted that there are national specific requirements that might not exist in other countries. In fact, based on their experiences, successful cross-border providers have in-depth knowledge of the market context and legal requirements, compared to their competitors. In fact, the national context is key in public procurement as 39% of the surveyed businesses perceive that local preferences influence outcomes of public procurement procedures to a high degree and a further 38% assess it of medium relevance.

Some public authorities suggest that the 'pre-qualification system', as is implemented in Germany and Austria (*Präqualifikation*), should be expanded to a Europe-wide level. As such, a given company interested in pursuing cross-border public procurement would need to send the required documents (e.g. Proof of no insolvency, Proof of payment of taxes and social contributions, confirmation of compliance with the trade law requirements, adherence to labour standards etc.) to a centralised public accreditation entity. If successfully accredited, it would receive a 'prequalification number' that could be used for a certain time period (e.g. 1 year). In this system, when bidding for a specific tender, the company would ideally only need to indicate the price and the prequalification number to the public authority in question. In addition, sharing knowledge has also been reported as a potential way to incentivize and promote best practices among public officers (see '*The Københavns Kommune - Menigo Foodservice AB'* case study). Organizing conferences to provide new ideas, exchange practices and learn from each other may be beneficial to spread knowledge in the context of cross-border public procurement and reduce the barriers due to '*lack of experience in doing-business-abroad'*.

5. CONCLUSIONS

The purpose of this study was to describe and analyse the structure of cross-border public procurement in the EU and to identify key trends and factors that influence the level of cross-border procurement.

From input-output tables at national level, **import penetration in the public sector is estimated at around 7.9% across the EU** ranging from 5.7% in Italy to 20.5% in Bulgaria. Overall, public sector import penetration appears to be lower in larger countries such as Italy and Germany. In addition, relatively low values are also found in the Netherlands, Denmark and Sweden. High levels of import penetration in the public sector seem to be a feature of Eastern European countries, given the relatively high values also for Slovakia, the Czech Republic and Latvia.

The same data source allows for a comparison of import penetration between the public and the private sectors. At the country level, **import penetration is considerably higher for the private sector**, where it ranges between 12.9% in Spain and 38% in Malta, **at an EU-wide average of 18.8%**.

Despite the much greater private sector import penetration, at the product level, import penetration is more often higher in the public sector than in the private sector, especially in sectors such as refined petroleum, chemicals, pharmaceuticals, rubber and plastic, basic metals, electrical equipment, and air transport.

Most of these sectors, however, represent a relatively small share of public purchasing compared to sectors where public purchasing is mainly domestic such as security, public administration and defence, social security, education and health. These five sectors alone represent over 58% of public sector purchasing and are all heavily tilted towards domestic purchasing. The conclusion from this analysis is therefore that **the lower import penetration in the public sector is to a large extent explained by the sectoral composition of public sector purchases**.

The extent of cross-border procurement is measured on the basis of contract awards data published on the TED database. The study focuses on two distinct forms of cross-border procurement: *direct cross-border procurement* - where the successful bidder is not located in the same country as the contracting authority and is not domestically owned, and *indirect cross-border procurement* - where the successful bidder is based in the same country as the contracting authority but is a subsidiary of a foreign company.

While direct cross-border procurement can be readily identified, indirect cross-border contracts can only be assigned to a particular country after the contract winner is matched with a database of firms and the nationality of the respective global ultimate owner (GUO) is identified. The study devises a tailored methodology which achieves a satisfactorily high rate of matching and assignment of contract winners to nationality of GUOs.

From the analysis of all matched awards from the TED database, it is observed that, over the period 2009-2015, direct cross-border procurement represented 1.7% of number and 3% of value of all contract awards by the EU28 Member States, while indirect cross-border was considerably higher at 21.9% of number and 20.4% of value of all EU28 contract awards.

Unsurprisingly, the vast majority of cross-border contracts are awarded to companies in other EU countries: 78.6 % of all contracts and 78.7% of the value of all contracts between 2009 and 2015. However, this percentage has generally followed a decreasing trend in terms of both number and value of awards, with the share of direct cross-border contracts awarded to firms within the EU decreasing from 87.4% in 2009 to 73.6% in 2015, and the value from 84.4% to 73.2% in the same period.

In terms of the composition of cross-border procurement, the findings include:

Contracting authorities:

- Apart from EU institutions, the highest shares of **direct cross-border** are found in contracts issued by the water, energy, transport and telecommunications sectors, with 5.5% of the value of all awards and 4.3% of the number of all awards. The lowest share of direct cross-border procurement in the number and value of awards arose in local or regional agencies and local authorities. As regards the share of **indirect cross-border** purchases, the highest share in the number and value of awards occurred in bodies governed by public law (27.4% and 23.3% respectively) and the lowest in local authorities (15.3% and 16.9% respectively);

- The share of direct cross-border procurement was considerably **higher in awards covered by the Utilities Directive than the Classical Directive** in terms of both number and value of contract awards. Comparing the shares of indirect cross-border procurement, there is less of a clear pattern. Although the share of indirect cross-border contracts in the number of awards is larger for contracts covered by the Classical Directive, indirect cross-border procurement as a share of value of awards is higher for contracts covered by the Utilities Directive;

- Considering the different types of procedures, contracts awarded through negotiation without a call for competition and contracts awarded through competitive dialogue were those with the highest shares of direct and indirect cross-border procurement in terms of number of awards;

- Comparing awards by whether they were financed by EU funds, the direct cross-border share of procurement in terms of both the number and value of awards was larger for awards financed by EU funds compared to awards which were not financed by EU funds or where funding was not specified. On the other hand, the share of indirect cross-border procurement in the number of awards was considerably lower for awards financed by EU funds at 12.7% compared to 23.0% for awards that were not financed by EU funds and 21.2% where the source of funding was not specified. However, in terms of the share of indirect cross-border procurement in the value of awards, this gap was much smaller with the share of indirect cross-border procurement at 18.3% for awards financed by EU funding compared to 20.9% and 20.0% for awards which were not financed by EU funds or where the source of funding was not specified. This implies that although a small share of indirect cross-border procurement in the number of awards is financed by EU funds, these are generally large contracts in terms of value.

Economic operators:

- The share of SMEs in direct cross-border by number of contracts awarded is estimated at 26.9%, while large firms accounted for 73.1% of all direct cross-border contract awards. Among SME classes, small firms accounted for the highest share of cross-border awards at 11.5% while micro and medium firms accounted for 7.7% and 7.8% respectively.

- Businesses reported the following main obstacles for bidding cross-border:

    1. 'High competition from national bidders' (40%);

    2. 'Perceived preference among contracting authorities for local bidders' (39%);

    3. 'Unfamiliar legal context or formal requirements (e.g. contract, labour law, certificates to provide such as special permits necessary for offering services abroad etc.) leading to market entry barriers in the awarding country' (32%);

    4. 'Additional costs due to geographic distance (i.e. implementation of contract is more expensive compared to delivery of contract close to own location)' (30%);

    5. 'Language barriers' (23%);

    6. 'Lack of experience with doing business abroad in general' (23%);

    7. Almost half of micro enterprises also reported that identifying information sources to access cross-border public procurements was a challenge.

Differences among Member States:

- Economic theory suggests that import penetration for the public sector and at the economy-wide level is influenced by country characteristics such as the size of the national economy, geographic location, natural endowments, the history and the structure of the industry. For instance, our results show that import penetration is higher for small countries due to resource constraints (see case study on '*Dun Laoghaire Institute of Art Design & Technology*'), and that 'similar' countries (in terms of language, history, geography) are more likely to trade with each other (see case studies on '*Why Czech companies are so successful in Slovak public procurement?'* and on '*Københavns Kommune - Menigo Foodservice AB*').

- Based on the analysis of TED data, there appears to be geographic, historic and language related motives mainly in awards for direct cross-border procurement. For instance, 75% of Irish direct cross-border contracts are won by UK companies and 69% of Slovak direct cross-border contracts are won by Czech firms. Cross-country relationships take a similar form whether procurement is direct or indirect cross-border.

- Germany, UK, France and the Netherlands stand out as countries whose companies supply relatively high shares of both direct and indirect cross-border contracts. Their success may be attributable to a relatively high number of companies that have specialised in providing niche technologies and that have specific expertise. These factors give them a strong competitive position vis-à-vis rivals based in other EU countries (see case studies on *'A pipe organ for Tartu Saint Paul´s church'*, '*Landesbaudirektion Salzburg'* and on *'Italy – France: Hi-tech equipment for the education sector'*).

Final remarks

Direct cross-border purchasing by public authorities has increased moderately over the period 2009-2015 but remains very low at just 2% of the number of awards and 3.5% of the value of awards. Indirect cross-border is substantially higher, at above 20% of both number and value of awards.

This observed low penetration of cross-border awards in public purchasing appears, nonetheless, unlikely to reflect domestic bias on the part of contracting authorities, but instead to be largely attributable to the less tradable nature of services bought by the public sector. Indeed, at the sectoral level, there is no evidence that the public sector has a lower propensity to import than the private sector.

In terms of trading partners, the behaviour of both direct and indirect cross-border procurement mirrors closely that of imports more broadly: import penetration is higher from trading partners that are culturally and geographically close.

In terms of the relationship between cross-border contracting and country size, the relationship between low market size and high import penetration holds only for direct cross-border contracts and there is no observable relationship between the extent that countries engage in direct cross-border and indirect cross-border procurement

The observed patterns for direct cross-border contracting are borne out by the results of the study's survey according to which competition from domestic suppliers and legal and language barriers are among the most important deterrents to cross-border bidding.

One other often mentioned deterrent to direct cross-border bidding, namely a perceived domestic bias on the part of contracting authorities, may be important to address even if this perception does not appear to be directly supported by the data.

The fact that indirect cross-border procurement is often high when direct cross-border is low may be a reflection of, actual or perceived, barriers to cross-border bidding which lead firms to rely on locally based subsidiaries for their cross-border sales.

There is a perception from the field work that contracting authorities believe that there is significant extra cost in designing a call for tender in such a way as to facilitate or encourage cross-border bidders. As a result, contracting authorities will often choose not to incur these extra costs and will do so only when they have reason to believe that no domestic supplier will be able to meet the requirements of the project. Even when explicitly reaching for cross-border bidders, authorities may first reach out to the more natural or traditional trading partners and only in very occasional circumstances, for particularly complex requirements, would they truly reach across the entire EU and internationally.

Given the complexity of cross-border procurement and the particularities of each EU country, firms see direct cross-border bidding as less likely to succeed than indirect cross-border. As the firms' strategy to reach cross-border markets develops, they are therefore more likely to establish a subsidiary to deal with the complexity of country-specific requirements. Cross-border bidders see a local presence as an advantage also because contracting authorities are perceived to favour contractors who speak their language and are not geographically remote.

These findings are to feed into an evaluation of cross-border public procurements, which will be conducted by the European Commission. They deliver insights on the evolution and structure and on some of the drivers and obstacles to cross-border procurement from the perspective of both contracting authorities and private sector bidders.

6. ANNEXES

6.1. Overview of data availability for input-output approach

The first sub-section of this annex discusses the data coverage provided by Eurostat's supply, use and input-output tables, with a particular focus on the availability of import use tables which are required for the analysis of public sector import penetration contained in Section 2.

Where no supply, use, or input-output sources were found on Eurostat, country level and international sources such as the WIOD[69] and OECD[70] were also considered. However, international sources were largely not used due to data quality concerns or availability of the data. For instance, many international sources estimate import input-output tables directly from economy-wide import shares making these tables unusable to distinguish between import penetration in the public and private sectors.

It can be noted that wherever possible use tables were used for the analysis. However, if they were not available or if input-output tables were available for a greater number of data points then input-output tables were used instead.

Unless stated otherwise, all tables referred to in this section can be found in Eurostat.

The countries for which use tables were used are outlined in Table 53, the countries for which input-output tables were used are outlined in Table 54 and the countries for which data was not available are outlined in Table 55.

Table 53: Domestic and import use tables available

Country/Region	Latest data point	Change measured between
Austria	2012	2010-2012
Croatia	2010	-
Czech R.	2010	2005-2010
Denmark	2010	2008-2010
Estonia	2011	2010-2011
Finland	2011	2010-2011
France	2012	2010-2012
Greece	2010	-
Hungary	2012	2010-2012
Ireland	2011	2010-2011
Italy	2012	2010-2012
Malta	2010	-
Netherlands	2012	2010-2012
Slovakia	2012	2010-2012
EU28*	2012	2010-2012

Source: Eurostat, national statistical institutes.
Notes: * EU28 import table is considering extra-EU imports rather than the total value of imports from the EU28.

69 The World Input-Output Database (WIOD) was not used due to data quality concerns.
70 OECD Input-Output tables were not used as import input-output tables are estimated directly from economy-wide import shares.

Table 54: Domestic and import input-output tables available

Country/Region	Latest data point	Change measured between
Belgium	2010	2005-2010
Bulgaria	2010	-
Germany	2010	2007-2010
Latvia	1998	1996-1998
Lithuania	2010	2005-2010
Poland	2010	2005-2010
Portugal	2008	2005-2008
Slovenia	2010	2005-2010
Spain	2010	2005-2010
Sweden	2011	2008-2011
Non-EU		
Norway	2007	2003-2007

Source: Eurostat, national statistical institutes.

Table 55: Domestic and import use/input-output table not available

Country/Region	Notes
Cyprus	No import specific use table or input-output table available.
Luxembourg	No import specific use table or input-output table available.
Romania	In import table, 0's for government consumption. Hence, it is not possible to compute public sector import penetration
United Kingdom	In import table, 0's for government consumption. Hence, it is not possible to compute public sector import penetration
Non-EU	
Canada	No import specific use table or input-output table available.
China	No import specific use table or input-output table available.
Japan	In import table, 0's for government consumption. Hence, it is not possible to compute public sector import penetration
US	In import table, 0's for government consumption. Hence, it is not possible to compute public sector import penetration
Switzerland	No import specific use table or input-output table available.

Source: Eurostat, national statistical institutes.

6.1.1. Conversion between CPA classifications

There were discrepancies between the classification of CPA used in the use and input-output tables as some followed the CPA 2002 classification while others followed the CPA 2008 classification.

Based on the Eurostat correspondence table between CPA 2002 and CPA 2008, an approximate conversion was used to match the classifications.

Table 56: CPA 2002 conversion to CPA 2008

CPA 2002	CPA 2008
Air transport services	Air transport services
Basic metals	Basic metals
Chemicals, chemical products and man-made fibres	Chemicals and chemical products
Coke, refined petroleum products and nuclear fuels	Coke and refined petroleum products
Construction work	Constructions and construction works
Education services	Education services
Electrical energy, gas, steam and hot water	Electricity, gas, steam and air conditioning
Fabricated metal products, except machinery and equipment	Fabricated metal products, except machinery and equipment
Financial intermediation services, except insurance and pension funding services	Financial services, except insurance and pension funding
Fish and other fishing products; services incidental of fishing	Fish and other fishing products; aquaculture products; support services to fishing
Food products and beverages	Food, beverages and tobacco products
Tobacco products	Food, beverages and tobacco products
Furniture; other manufactured goods n.e.c.	Furniture and other manufactured goods
Health and social work services	Human health services*4/5 Residential care services, social work*1/5
Insurance and pension funding services, except compulsory social security services	Insurance, reinsurance and pension funding services, except compulsory social security
Land transport; transport via pipeline services	Land transport services and transport services via pipelines
Machinery and equipment n.e.c.	Machinery and equipment n.e.c.
Coal and lignite; peat	Mining and quarrying
Uranium and thorium ores	Mining and quarrying
Metal ores	Mining and quarrying
Other mining and quarrying products	Mining and quarrying
Radio, television and communication equipment and apparatus	Motion picture, video and television programme production services, sound recording and music publishing; programming and broadcasting services
Motor vehicles, trailers and semi-trailers	Motor vehicles, trailers and semi-trailers
Collected and purified water, distribution services of water	Natural water; water treatment and supply services
Other non-metallic mineral products	Other non-metallic mineral products
Other business services	Other professional, scientific and technical services and veterinary services
Other transport equipment	Other transport equipment
Pulp, paper and paper products	Paper and paper products
Printed matter and recorded media	Printing and recording services
Products of agriculture, hunting and related services	Products of agriculture, hunting and related services
Products of forestry, logging and related services	Products of forestry, logging and related services
Public administration and defence services; compulsory social security services	Public administration and defence services; compulsory social security services
Real estate services	Rental and leasing services
Retail trade services, except of motor vehicles and motorcycles; repair services of personal and household goods	Retail trade services, except of motor vehicles and motorcycles
Rubber and plastic products	Rubber and plastic products
Research and development services	Scientific research and development services
Sewage and refuse disposal services, sanitation and similar services	Sewerage services; sewage sludge; waste collection, treatment and disposal services; materials recovery services; remediation services and other waste services

CPA 2002	CPA 2008
Textiles	Textiles, wearing apparel, leather and related products
Wearing apparel; furs	Textiles, wearing apparel, leather and related products
Leather and leather products	Textiles, wearing apparel, leather and related products
Total	Total
Supporting and auxiliary transport services; travel agency services	Warehousing and support services for transportation
Water transport services	Water transport services
Trade, maintenance and repair services of motor vehicles and motorcycles; retail sale of automotive fuel	Wholesale and retail trade and repair services of motor vehicles and motorcycles
Wholesale trade and commission trade services, except of motor vehicles and motorcycles	Wholesale and retail trade and repair services of motor vehicles and motorcycles
Wood and products of wood and cork (except furniture); articles of straw and plaiting materials	Wood and of products of wood and cork, except furniture; articles of straw and plaiting materials
Crude petroleum and natural gas; services incidental to oil and gas extraction excluding surveying	Mining and quarrying
Secondary raw materials	Sewerage; waste collection, treatment and disposal activities; materials recovery; remediation activities and other waste management services
Hotel and restaurant services	Accommodation and food services
Services auxiliary to financial intermediation	Services auxiliary to financial services and insurance services
Renting services of machinery and equipment without operator and of personal and household goods	Rental and leasing services
Membership organisation services n.e.c.	Services furnished by membership organisations
Other services	Other personal services
Private households with employed persons	Services of households as employers; undifferentiated goods and services produced by households for own use
Computer and related services	Publishing services *1/2 Computer programming, consultancy and related services; information services*1/2
Post and telecommunication services	Telecommunications * 2/3 Postal & courier service* 1/3
Medical, precision and optical instruments, watches and clocks	Furniture; other manufactured goods *1/3, Repair and installation services of machinery and equipment*1/3 and Computer, electronic and optical products*1/3
Recreational, cultural and sporting services	Creative, arts and entertainment services; library, archive, museum and other cultural services; gambling and betting services*1/2 Sporting services and amusement and recreation services*1/4 Motion picture, video and television programme production services, sound recording and music publishing; programming and broadcasting services*1/4
Electrical machinery and apparatus n.e.c.	Furniture; other manufactured goods *1/4 Electrical equipment *3/4
Office machinery and computers	Machinery and equipment n.e.c. *1/2 Computer, electronic and optical products *1/2

6.2. Extension of results to different definitions of the public sector

As a) the split in public/private provision of a number of the wider public sector services varies across Member States and b) not all companies in the regulated energy, postal, transport and water sectors are listed as a contracting authority subject to EU procurement rules, the import penetration of public procurement markets is considered for two further definitions of the public sector.

The definitions of the public sector which will be used in this annex are:

- Narrow concept of public sector:
    - Final consumption expenditure by government + NACE REV2: O public administration and defence; compulsory social security (100%)
- Typical concept of public sector:
    - Narrow concept +NACE REV2: P Education (100%) + NACE REV2: Q Human health and social work activities (100%)
- Public sector concept applied in chapter 2 ('Broad concept'):
    - Typical concept + NACE REV 2: D electricity, gas, steam and air conditioning supply (100%) + NACE REV 2: E water supply, sewerage waste management and remediation activities (100%) + NACE REV2: H49 land transport and transport via pipelines (33%) + NACE REV 2: H53 postal and courier services (50%) + NACE REV 2: J61 Telecommunication services (50%)[71]

6.2.1. Size of the public sector

Table 57: Size of the public sector by narrow, typical and broad definitions of the public sector

Country	Value (Bn EUR)			Share of sectors in total use		
	Typical definition of the public sector	Narrow definition of the public sector	Broad definition of the public sector	Typical definition of the public sector	Narrow definition of the public sector	Broad definition of the public sector
Austria,2012	79.7	68.9	105.7	10.6%	9.2%	14.1%
Belgium,2010	105.5	91.7	125.8	10.4%	9.0%	12.4%
Bulgaria,2010	7.8	6.6	11.7	8.1%	6.9%	12.2%
Croatia,2010	12	10.7	15.1	12.8%	11.4%	16.2%
Cyprus	-	-	-	-	-	-
Czech R.,2012	40.5	35	58.3	8.2%	7.0%	11.7%
Denmark,2011	83.2	71.1	94.5	15.2%	13.0%	17.2%
Estonia,2011	4	3.5	5.6	8.5%	7.4%	11.7%
Finland,2011	65.2	53.7	73.9	14.3%	11.7%	16.2%
France,2012	610.4	546.4	746.2	14.0%	12.5%	17.1%
Germany,2011	663.3	566.2	812.6	10.8%	9.2%	13.3%
Greece,2010	60.8	55.6	69.1	14.3%	13.1%	16.3%
Hungary,2012	24.9	21.9	31.2	8.9%	7.8%	11.2%
Ireland,2011	42	35.9	46.5	9.0%	7.7%	10.0%
Italy,2012	404	341.2	526.6	11.3%	9.6%	14.8%
Latvia,1998	1	0.9	1.3	10.7%	9.4%	13.4%

71 Where NACE REV 1 sectors were used the definition of the typical and broad public sectors were adjusted accordingly. The typical concept of the public sector was defined as the Narrow concept+ NACE REV 1: Education services (100%) + NACE REV 1: Health and social work services (100%). As to the broad concept of the public sector, it was instead given by typical concept of the public sector +NACE REV 1: Electrical energy, gas, steam and hot water (100%) + NACE REV 1: Collected and purified water, distribution services of water (100%) + NACE REV 1: Sewage and refuse disposal services, sanitation and similar services (100%) + NACE REV 1: Land transport; transport via pipeline services (33%) + NACE REV 1:Post and telecommunication services (50%).

Country	Value (Bn EUR)			Share of sectors in total use		
	Typical definition of the public sector	Narrow definition of the public sector	Broad definition of the public sector	Typical definition of the public sector	Narrow definition of the public sector	Broad definition of the public sector
Lithuania,2010	6.9	6.2	9.4	10.2%	9.1%	13.8%
Luxembourg	-	-	-	-	-	-
Malta,2010	1.7	1.5	1.7	6.0%	5.3%	6.0%
Netherlands,2012	226.7	197.3	253.5	13.2%	11.5%	14.8%
Poland,2010	86.7	74.8	109.3	10.0%	8.6%	12.6%
Portugal,2008	56.4	38.2	64.4	14.0%	9.5%	16.0%
Romania,2011	-	-	-	7.9%	6.7%	12.6%
Slovakia,2011	16.5	14.5	27.7	7.4%	6.5%	12.5%
Slovenia,2010	9.5	8.2	12	10.2%	8.9%	13.0%
Spain,2010	276.2	238.9	364.5	11.9%	10.3%	15.7%
Sweden,2011	131.5	111	145	14.7%	12.4%	16.2%
UK,2010	-	-	-	16.0%	12.1%	19.4%
EU28,2012	3,623.60	3,113.10	4,491.20	13.8%	11.9%	17.1%

Source: London Economics based on Eurostat and national statistical institutes.
Note: All use/ input-output tables sourced from Eurostat.

6.2.2. Country level

Table 58: Import penetration of the public sector by narrow, typical and broad definitions of the public sector

Country	Value (Bn EUR)			Import penetration		
	Typical definition of the public sector	Narrow definition of the public sector	Broad definition of the public sector	Typical definition of the public sector	Narrow definition of the public sector	Broad definition of the public sector
Austria,2012	79.7	68.9	105.7	5.9%	3.3%	10.4%
Belgium,2010	105.5	91.7	125.8	4.3%	2.1%	8.8%
Bulgaria,2010	7.8	6.6	11.7	10.3%	7.4%	20.5%
Croatia,2010	12.0	10.7	15.1	5.4%	3.8%	9.9%
Cyprus	-	-	-	-	-	-
Czech R.,2012	40.5	35.0	58.3	9.0%	4.7%	16.7%
Denmark,2011	83.2	71.1	94.5	4.9%	2.6%	7.1%
Estonia,2011	4.0	3.5	5.6	9.2%	5.1%	15.3%
Finland,2011	65.2	53.7	73.9	4.6%	2.6%	7.6%
France,2012	610.4	546.4	746.2	5.1%	3.5%	8.5%
Germany,2011	663.3	566.2	812.6	4.4%	3.0%	6.9%
Greece,2010	60.8	55.6	69.1	8.9%	8.1%	10.2%
Hungary,2012	24.9	21.9	31.2	8.2%	5.1%	13.8%
Ireland,2011	42.0	35.9	46.5	12.5%	10.2%	15.6%

Country	Value (Bn EUR)			Import penetration		
	Typical definition of the public sector	Narrow definition of the public sector	Broad definition of the public sector	Typical definition of the public sector	Narrow definition of the public sector	Broad definition of the public sector
Italy,2012	404.0	341.2	526.6	3.2%	1.8%	5.7%
Latvia,1998	1.0	0.9	1.3	10.4%	8.0%	16.3%
Luxembourg	-	-	-	-	-	-
Lithuania,2010	6.9	6.2	9.4	5.0%	3.4%	12.1%
Malta,2010	1.7	1.5	1.7	7.3%	4.7%	7.3%
Netherlands,2012	226.7	197.3	253.5	4.1%	1.9%	6.8%
Poland,2010	86.7	74.8	109.3	4.3%	2.8%	7.8%
Portugal,2008	56.4	38.2	64.4	8.6%	2.5%	9.5%
Romania,2011	-	-	-	-	-	-
Slovakia,2011	16.5	14.5	27.7	10.7%	8.8%	17.0%
Slovenia,2010	9.5	8.2	12.0	7.5%	3.2%	12.4%
Spain,2010	276.2	238.9	364.5	4.6%	3.1%	8.2%
Sweden,2011	131.5	111.0	145.0	4.2%	2.5%	5.8%
UK,2010	-	-	-	-	-	-
EU, latest available year and all countries available	-	-	-	4.8%	3.1%	7.9%

Source: London Economics based on Eurostat and national statistical institute data.
Notes: EU levels are calculated as weighted averages using the latest available year for each country.

6.2.3. *Product level*

Table 59: Product level import penetration by narrow definition of the public sector, EU Member States

Product	AT	BE	BG	HR	CY	CZ	DK	EE	FI	FR	DE	EL	HU	IE	IT	LV	LT	LU	MT	NL	PL	PT	RO	SK	SI	ES	SE	UK
Products of agriculture, hunting and related services	13%	3%	10%	13%	-	0%	58%	0%	0%	0%	47%	15%	4%	0%	0%	0%	0%	-	0%	3%	13%	27%	-	27%	0%	5%	59%	-
Products of forestry, logging and related services	13%	0%	1%	2%	-	0%	0%	0%	0%	5%	83%	0%	0%	0%	0%	0%	0%	-	100%	40%	14%	0%	-	4%	0%	0%	0%	-
Fish and other fishing products; aquaculture products; support	0%	0%	20%	0%	-	0%	68%	0%	0%	0%	100%	0%	0%	0%	0%	0%	0%	-	7%	0%	0%	37%	-	50%	0%	0%	80%	-
Mining and quarrying	22%	85%	0%	0%	-	17%	51%	0%	0%	31%	65%	86%	86%	98%	92%	62%	0%	-	100%	33%	16%	7%	-	84%	2%	39%	22%	-
Food, beverages and tobacco products	41%	28%	29%	40%	-	42%	52%	0%	0%	22%	22%	30%	16%	75%	0%	4%	0%	-	89%	25%	42%	26%	-	58%	0%	8%	30%	-
Textiles, wearing apparel, leather and related products	89%	57%	52%	96%	-	93%	81%	0%	0%	79%	79%	44%	39%	96%	37%	18%	0%	-	100%	87%	90%	29%	-	82%	64%	16%	86%	-
Wood and of products of wood and cork, except furniture; articles of straw and plaiting materials	41%	42%	27%	63%	-	26%	46%	0%	0%	29%	24%	24%	0%	52%	0%	12%	0%	-	39%	0%	35%	13%	-	21%	0%	14%	12%	-
Paper and paper products	84%	55%	59%	45%	-	73%	79%	0%	0%	26%	16%	62%	38%	87%	40%	69%	0%	-	72%	40%	66%	39%	-	76%	97%	26%	56%	-
Printing and recording services	1%	2%	1%	0%	-	2%	1%	0%	0%	0%	6%	1%	0%	80%	0%	7%	0%	-	1%	11%	1%	2%	-	1%	1%	0%	0%	-
Coke and refined petroleum products	13%	31%	42%	27%	-	38%	60%	0%	0%	42%	48%	33%	22%	0%	0%	99%	0%	-	100%	65%	44%	22%	-	45%	100%	51%	52%	-
Chemicals and chemical products	99%	55%	66%	74%	-	86%	90%	91%	0%	51%	41%	68%	37%	100%	27%	96%	0%	-	51%	45%	86%	52%	-	90%	100%	30%	83%	-
Basic pharmaceutical products and pharmaceutical preparations	88%	99%	92%	30%	-	89%	74%	100%	76%	80%	53%	75%	84%	96%	77%	0%	84%	-	100%	53%	87%	65%	-	99%	66%	90%	0%	-
Rubber and plastic products	78%	55%	51%	58%	-	67%	64%	0%	0%	0%	55%	40%	0%	84%	0%	75%	0%	-	100%	78%	90%	53%	-	69%	100%	27%	73%	-
Other non-metallic mineral products	25%	16%	19%	36%	-	50%	29%	0%	0%	24%	7%	14%	88%	33%	4%	49%	0%	-	50%	34%	17%	10%	-	48%	0%	10%	77%	-
Basic metals	65%	1%	37%	0%	-	78%	80%	0%	0%	0%	47%	0%	0%	100%	11%	60%	0%	-	100%	100%	53%	66%	-	93%	67%	18%	71%	-
Fabricated metal products, except machinery and equipment	79%	25%	29%	37%	-	40%	14%	0%	0%	32%	35%	12%	59%	67%	0%	34%	0%	-	16%	31%	87%	67%	-	48%	84%	17%	34%	-
Computer, electronic and optical products	83%	63%	96%	40%	-	93%	60%	0%	0%	88%	39%	98%	62%	99%	47%	69%	0%	-	90%	60%	85%	99%	-	96%	100%	49%	86%	-
Electrical equipment	100%	53%	72%	55%	-	66%	87%	0%	0%	74%	43%	67%	0%	96%	59%	62%	0%	-	80%	86%	100%	83%	-	99%	98%	31%	81%	-
Machinery and equipment n.e.c.	98%	68%	78%	61%	-	81%	74%	0%	0%	69%	68%	75%	94%	99%	6%	77%	0%	-	100%	50%	89%	96%	-	96%	70%	78%	87%	-
Motor vehicles, trailers and semi-trailers	81%	49%	41%	51%	-	60%	88%	0%	0%	61%	62%	0%	0%	93%	57%	83%	0%	-	100%	100%	73%	81%	-	70%	59%	49%	100%	-
Other transport equipment	97%	86%	68%	8%	-	59%	80%	100%	0%	64%	28%	0%	72%	100%	0%	31%	44%	-	100%	90%	86%	90%	-	50%	14%	65%	90%	-
Furniture and other manufactured goods	54%	82%	50%	18%	-	66%	75%	69%	0%	75%	35%	76%	76%	0%	80%	71%	12%	-	60%	45%	52%	51%	-	95%	64%	46%	80%	-
Repair and installation services of machinery and equipment	0%	3%	9%	10%	-	6%	16%	0%	0%	4%	1%	0%	0%	0%	0%	67%	0%	-	1%	2%	0%	3%	-	0%	8%	0%	21%	-
Electricity, gas, steam and air conditioning	1%	41%	1%	15%	-	8%	4%	0%	0%	1%	7%	6%	22%	0%	8%	3%	0%	-	0%	15%	1%	0%	-	1%	22%	0%	5%	-
Natural water; water treatment and supply services	1%	0%	0%	0%	-	0%	0%	0%	0%	0%	0%	0%	0%	0%	4%	0%	0%	-	0%	0%	1%	0%	-	0%	0%	0%	0%	-
Sewerage services; sewage sludge; waste collection, treatment and	3%	0%	76%	7%	-	2%	3%	0%	0%	5%	2%	0%	0%	0%	0%	0%	0%	-	1%	0%	1%	5%	-	65%	36%	0%	7%	-
Constructions and construction works	1%	0%	3%	0%	-	3%	0%	0%	0%	0%	0%	1%	0%	0%	9%	0%	0%	-	0%	2%	1%	0%	-	3%	1%	0%	0%	-
Wholesale and retail trade and repair services of motor vehicles and	0%	0%	0%	0%	-	1%	0%	0%	0%	0%	1%	0%	0%	0%	10%	0%	0%	-	2%	0%	0%	0%	-	0%	0%	0%	0%	-
Wholesale trade services, except of motor vehicles and motorcycles	0%	0%	0%	0%	-	0%	0%	0%	0%	1%	0%	0%	0%	52%	0%	0%	0%	-	0%	0%	0%	0%	-	0%	0%	0%	0%	-
Retail trade services, except of motor vehicles and motorcycles	0%	0%	0%	0%	-	0%	0%	0%	0%	0%	0%	0%	0%	0%	0%	0%	0%	-	0%	0%	0%	0%	-	0%	0%	0%	0%	-
Land transport services and transport services via pipelines	1%	3%	14%	31%	-	5%	8%	0%	0%	6%	2%	1%	0%	10%	12%	0%	3%	-	1%	5%	1%	4%	-	13%	9%	2%	5%	-
Motion picture, video and television programme production services,	0%	0%	2%	14%	-	1%	0%	0%	0%	2%	0%	0%	0%	0%	0%	2%	0%	-	100%	0%	0%	1%	-	0%	0%	0%	13%	-
Water transport services	72%	0%	7%	15%	-	0%	1%	0%	0%	84%	0%	14%	0%	30%	40%	0%	67%	-	17%	0%	58%	29%	-	33%	80%	0%	57%	-
Air transport services	38%	78%	11%	34%	-	43%	64%	0%	0%	41%	10%	18%	72%	53%	45%	71%	71%	-	12%	30%	29%	25%	-	23%	76%	0%	65%	-
Warehousing and support services for transportation	0%	0%	17%	0%	-	0%	2%	0%	0%	13%	1%	14%	0%	0%	0%	0%	4%	-	9%	1%	0%	2%	-	1%	13%	0%	1%	-
Postal and courier services	1%	0%	0%	1%	-	17%	2%	0%	0%	8%	5%	3%	4%	40%	24%	0%	0%	-	2%	1%	1%	7%	-	3%	2%	0%	0%	-

Product	AT	BE	BG	HR	CY	CZ	DK	EE	FI	FR	DE	EL	HU	IE	IT	LV	LT	LU	MT	NL	PL	PT	RO	SK	SI	ES	SE	UK
Accommodation and food services	33%	61%	14%	64%	-	57%	0%	0%	0%	0%	58%	9%	2%	51%	0%	43%	7%	-	2%	54%	35%	20%	-	1%	16%	4%	0%	-
Publishing services	39%	20%	12%	6%	-	72%	18%	0%	0%	10%	8%	25%	10%	0%	1%	0%	0%	-	75%	7%	40%	16%	-	29%	25%	16%	14%	-
Telecommunications services	1%	26%	1%	13%	-	16%	11%	0%	0%	5%	6%	5%	9%	25%	0%	0%	0%	-	0%	7%	1%	11%	-	5%	16%	5%	1%	-
Computer programming, consultancy and related services;	1%	9%	10%	11%	-	20%	20%	0%	0%	7%	18%	19%	16%	16%	4%	0%	0%	-	0%	15%	0%	10%	-	10%	13%	18%	15%	-
Financial services, except insurance and pension funding	25%	11%	9%	4%	-	3%	1%	0%	0%	4%	23%	12%	1%	33%	5%	0%	4%	-	2%	7%	22%	18%	-	40%	5%	22%	9%	-
Insurance, reinsurance and pension funding services, except	0%	7%	13%	9%	-	31%	7%	0%	0%	2%	3%	30%	0%	64%	37%	0%	0%	-	35%	15%	0%	22%	-	44%	4%	4%	1%	-
Services auxiliary to financial services and insurance services	0%	7%	0%	0%	-	0%	4%	0%	0%	0%	0%	0%	0%	0%	0%	0%	0%	-	100%	0%	0%	0%	-	7%	0%	2%	0%	-
Legal and accounting services; services of head offices; management	0%	11%	23%	15%	-	13%	15%	0%	0%	3%	5%	6%	0%	6%	0%	0%	0%	-	0%	3%	0%	7%	-	3%	7%	2%	20%	-
Architectural and engineering services; technical testing and analysis	0%	14%	18%	4%	-	0%	8%	0%	0%	14%	16%	4%	0%	15%	37%	0%	0%	-	2%	14%	0%	4%	-	5%	5%	3%	6%	-
Scientific research and development services	0%	8%	40%	0%	-	0%	18%	0%	0%	0%	0%	0%	0%	94%	0%	0%	0%	-	40%	0%	0%	0%	-	0%	0%	0%	0%	-
Advertising and market research services	0%	28%	3%	29%	-	11%	23%	0%	0%	21%	21%	5%	0%	91%	0%	0%	0%	-	91%	13%	0%	7%	-	2%	36%	4%	18%	-
Other professional, scientific and technical services and veterinary	0%	10%	0%	15%	-	4%	6%	0%	0%	0%	10%	11%	1%	83%	0%	0%	0%	-	51%	13%	0%	9%	-	59%	27%	0%	24%	-
Travel agency, tour operator and other reservation services and	0%	0%	65%	6%	-	22%	77%	0%	0%	0%	0%	0%	0%	0%	0%	0%	0%	-	60%	0%	0%	2%	-	0%	23%	5%	0%	-
Rental and leasing services	1%	6%	37%	13%	-	42%	5%	0%	0%	15%	4%	15%	8%	100%	7%	0%	0%	-	6%	40%	1%	8%	-	22%	57%	21%	19%	-
Employment services	1%	0%	0%	0%	-	3%	0%	0%	0%	0%	0%	0%	0%	0%	0%	0%	0%	-	0%	1%	1%	0%	-	0%	0%	0%	0%	-
Security and investigation services; services to buildings and	0%	16%	0%	0%	-	8%	6%	0%	0%	16%	3%	3%	0%	0%	3%	0%	0%	-	0%	1%	0%	2%	-	0%	0%	8%	7%	-
Public administration and defence services; compulsory social	0%	0%	0%	0%	-	0%	1%	0%	0%	0%	0%	0%	1%	0%	0%	14%	0%	-	2%	0%	0%	0%	-	0%	0%	0%	0%	-
Education services	0%	0%	4%	0%	-	0%	0%	0%	0%	0%	0%	0%	0%	0%	0%	0%	0%	-	0%	0%	0%	0%	-	0%	0%	0%	0%	-
Human health services	0%	0%	2%	0%	-	0%	0%	0%	0%	0%	0%	0%	0%	0%	0%	0%	0%	-	0%	0%	0%	0%	-	0%	0%	0%	0%	-
Residential care services; social work services without	0%	0%	0%	0%	-	0%	0%	0%	0%	0%	0%	0%	0%	0%	0%	0%	0%	-	0%	0%	0%	0%	-	0%	0%	0%	0%	-
Imputed rents of owner-occupied dwellings	0%	0%	0%	0%	-	0%	0%	0%	0%	0%	0%	0%	0%	0%	0%	0%	0%	-	0%	0%	0%	0%	-	0%	0%	0%	0%	-
Real estate services excluding imputed rents	1%	0%	0%	0%	-	0%	0%	0%	0%	0%	0%	0%	0%	0%	0%	0%	0%	-	1%	0%	1%	2%	-	0%	0%	0%	0%	-
Creative, arts, entertainment, library, archive, museum, other cultural	0%	1%	0%	0%	-	0%	0%	0%	0%	0%	0%	4%	0%	25%	0%	0%	0%	-	4%	0%	0%	11%	-	0%	0%	0%	0%	-
Sporting services and amusement and recreation services	0%	0%	11%	6%	-	0%	0%	0%	0%	0%	0%	5%	0%	8%	0%	0%	0%	-	16%	0%	0%	0%	-	5%	0%	0%	0%	-
Services furnished by membership organisations	0%	0%	0%	0%	-	0%	0%	0%	0%	0%	0%	0%	0%	0%	0%	0%	0%	-	8%	0%	0%	0%	-	0%	0%	0%	0%	-
Repair services of computers and personal and household goods	1%	0%	0%	0%	-	7%	0%	0%	0%	0%	0%	8%	0%	0%	0%	0%	0%	-	14%	5%	1%	0%	-	0%	0%	1%	0%	-
Other personal services	0%	1%	0%	0%	-	0%	0%	0%	0%	28%	0%	0%	0%	0%	0%	0%	0%	-	0%	0%	0%	1%	-	0%	0%	1%	0%	-
Services of households as employers; undifferentiated goods and	0%	0%	0%	0%	-	0%	0%	0%	0%	0%	0%	0%	0%	0%	0%	0%	0%	-	0%	0%	0%	0%	-	0%	0%	0%	0%	-
Services provided by extraterritorial organisations and bodies	0%	0%	0%	0%	-	0%	0%	0%	0%	0%	0%	0%	0%	0%	0%	0%	0%	-	0%	0%	0%	0%	-	0%	0%	0%	0%	-
Total	3%	2%	7%	4%	-	5%	3%	5%	3%	3%	3%	8%	5%	10%	2%	8%	3%	-	5%	2%	3%	3%	-	9%	3%	3%	2%	-

Source: London Economics based on Eurostat and national statistical institute data.
Notes: Stronger green shades represent products with a higher share of import penetration in public sector use in the respective column country. UK, Luxembourg & Romania are excluded as public sector import consumption is not available.

Table 60: Product-level import penetration by typical definition of the public sector, EU Member States

Product	AT	BE	BG	HR	CY	CZ	DK	EE	FI	FR	DE	EL	HU	IE	IT	LU	LV	LT	MT	NL	PL	PT	RO	SK	SI	ES	SE	UK
Products of agriculture, hunting and related services	51%	9%	11%	13%	-	18%	58%	71%	31%	8%	47%	15%	8%	0%	5%	-	1%	4%	4%	28%	51%	28%	-	32%	73%	9%	56%	-
Products of forestry, logging and related services	13%	17%	1%	2%	-	0%	0%	37%	20%	5%	83%	0%	0%	0%	0%	-	0%	16%	16%	40%	14%	0%	-	4%	7%	0%	0%	-
Fish and other fishing products; aquaculture products; support services to fishing	0%	31%	29%	0%	-	50%	68%	36%	62%	0%	68%	12%	0%	0%	0%	-	0%	59%	59%	79%	0%	37%	-	50%	62%	0%	81%	-
Mining and quarrying	37%	85%	62%	72%	-	17%	23%	50%	0%	27%	71%	86%	86%	98%	88%	-	65%	91%	91%	32%	31%	99%	-	86%	35%	40%	21%	-
Food, beverages and tobacco products	39%	32%	30%	32%	-	43%	41%	42%	27%	19%	27%	30%	27%	85%	0%	-	4%	44%	44%	29%	41%	28%	-	58%	46%	8%	34%	-
Textiles, wearing apparel, leather and related products	91%	60%	53%	96%	-	92%	83%	89%	67%	72%	68%	44%	57%	96%	11%	-	19%	28%	28%	84%	91%	40%	-	82%	78%	16%	84%	-
Wood and of products of wood and cork, except furniture; articles of straw and plaiting materials	41%	42%	30%	64%	-	25%	54%	3%	30%	28%	22%	24%	57%	52%	12%	-	16%	15%	15%	52%	34%	16%	-	27%	70%	14%	20%	-
Paper and paper products	84%	67%	59%	45%	-	74%	78%	99%	26%	27%	40%	62%	41%	87%	13%	-	69%	69%	69%	44%	73%	46%	-	76%	97%	25%	45%	-
Printing and recording services	1%	1%	1%	0%	-	2%	1%	0%	17%	0%	4%	1%	0%	80%	0%	-	8%	1%	1%	2%	1%	2%	-	1%	1%	0%	0%	-
Coke and refined petroleum products	53%	31%	42%	27%	-	38%	63%	94%	41%	42%	48%	33%	27%	0%	0%	-	99%	0%	0%	57%	64%	42%	-	45%	100%	51%	49%	-
Chemicals and chemical products	85%	49%	74%	74%	-	86%	87%	89%	71%	56%	63%	68%	71%	100%	4%	-	96%	56%	56%	63%	95%	63%	-	90%	100%	30%	82%	-
Basic pharmaceutical products and pharmaceutical preparations	81%	69%	92%	30%	-	89%	71%	100%	77%	82%	58%	75%	83%	96%	66%	-	0%	79%	79%	67%	83%	67%	-	99%	77%	78%	0%	-
Rubber and plastic products	70%	55%	51%	58%	-	58%	66%	77%	62%	49%	47%	40%	81%	84%	3%	-	75%	62%	62%	77%	89%	51%	-	70%	99%	28%	66%	-
Other non-metallic mineral products	29%	37%	19%	36%	-	43%	58%	45%	44%	24%	10%	16%	85%	33%	1%	-	49%	54%	54%	42%	25%	33%	-	49%	87%	10%	44%	-
Basic metals	65%	1%	29%	89%	-	80%	65%	100%	0%	0%	48%	43%	81%	100%	52%	-	64%	100%	100%	100%	53%	78%	-	90%	17%	19%	66%	-
Fabricated metal products, except machinery and equipment	80%	30%	24%	37%	-	40%	23%	88%	73%	36%	27%	12%	64%	67%	2%	-	35%	53%	53%	36%	87%	48%	-	48%	84%	16%	36%	-
Computer, electronic and optical products	86%	75%	95%	40%	-	94%	68%	100%	70%	82%	38%	98%	86%	99%	33%	-	71%	57%	57%	74%	81%	98%	-	96%	100%	53%	84%	-
Electrical equipment	100%	50%	73%	51%	-	66%	86%	100%	97%	74%	42%	67%	79%	96%	36%	-	63%	51%	51%	64%	100%	67%	-	99%	99%	32%	81%	-
Machinery and equipment n.e.c.	98%	67%	77%	61%	-	81%	70%	100%	0%	72%	55%	78%	93%	99%	5%	-	75%	68%	68%	73%	89%	89%	-	96%	66%	78%	87%	-
Motor vehicles, trailers and semi-trailers	81%	86%	44%	51%	-	60%	88%	100%	0%	60%	62%	87%	74%	93%	13%	-	83%	56%	56%	100%	73%	81%	-	70%	58%	50%	56%	-
Other transport equipment	97%	86%	66%	8%	-	59%	80%	100%	0%	64%	28%	96%	72%	100%	10%	-	29%	45%	45%	90%	86%	90%	-	57%	11%	66%	76%	-
Furniture and other manufactured goods	72%	86%	56%	18%	-	71%	78%	85%	55%	75%	43%	75%	81%	0%	35%	-	73%	18%	18%	82%	76%	76%	-	94%	62%	30%	58%	-
Repair and installation services of machinery and equipment	0%	6%	9%	10%	-	6%	10%	0%	0%	4%	2%	0%	0%	0%	0%	-	70%	0%	0%	2%	0%	3%	-	0%	8%	0%	14%	-
Electricity, gas, steam and air conditioning	0%	31%	1%	15%	-	8%	4%	7%	7%	1%	4%	6%	17%	0%	5%	-	3%	3%	3%	12%	0%	7%	-	1%	22%	0%	4%	-
Natural water; water treatment and supply services	0%	0%	0%	0%	-	0%	0%	0%	0%	0%	0%	0%	0%	0%	3%	-	0%	0%	0%	2%	0%	0%	-	0%	0%	0%	0%	-
Sewerage services; sewage sludge; waste collection, treatment and disposal services; materials recovery services; remediation services and other wa...	1%	0%	76%	7%	-	9%	3%	0%	0%	5%	2%	2%	0%	0%	0%	-	0%	65%	65%	0%	0%	5%	-	65%	36%	1%	10%	-
Constructions and construction works	0%	0%	3%	0%	-	3%	0%	0%	0%	0%	0%	1%	0%	0%	6%	-	0%	2%	2%	2%	0%	0%	-	2%	2%	0%	0%	-
Wholesale and retail trade and repair services of motor vehicles and motorcycles	0%	0%	0%	0%	-	3%	0%	0%	0%	0%	0%	0%	0%	0%	4%	-	0%	0%	0%	0%	0%	0%	-	0%	0%	0%	0%	-
Wholesale trade services, except of motor vehicles and motorcycles	0%	1%	0%	0%	-	0%	0%	0%	1%	4%	0%	0%	0%	52%	0%	-	0%	0%	0%	0%	0%	0%	-	0%	1%	1%	0%	-
Retail trade services, except of motor vehicles and motorcycles	0%	0%	0%	0%	-	0%	0%	0%	0%	0%	0%	0%	0%	0%	0%	-	0%	0%	0%	0%	0%	0%	-	0%	0%	0%	0%	-
Motion picture, video and television programme production services, sound recording and music publishing; programming and broadcasting services	4%	0%	2%	14%	-	2%	0%	3%	10%	5%	0%	0%	0%	0%	2%	-	2%	0%	0%	8%	4%	4%	-	0%	0%	0%	10%	-
Land transport services and transport services via pipelines	1%	4%	12%	31%	-	6%	4%	16%	4%	7%	1%	1%	0%	10%	10%	-	0%	3%	3%	6%	1%	4%	-	10%	10%	2%	3%	-
Water transport services	72%	2%	6%	15%	-	0%	2%	10%	50%	83%	0%	14%	0%	30%	21%	-	0%	70%	70%	0%	58%	29%	-	5%	72%	0%	54%	-
Air transport services	38%	80%	11%	34%	-	39%	64%	75%	43%	41%	11%	18%	73%	53%	39%	-	71%	72%	72%	28%	28%	26%	-	23%	76%	0%	64%	-
Warehousing and support services for transportation	1%	0%	17%	0%	-	0%	2%	0%	8%	13%	1%	14%	0%	0%	0%	-	0%	6%	6%	4%	1%	2%	-	1%	13%	0%	1%	-
Postal and courier services	1%	4%	0%	1%	-	17%	2%	72%	9%	8%	5%	3%	6%	40%	14%	-	0%	21%	21%	2%	1%	6%	-	3%	3%	0%	0%	-

Product	AT	BE	BG	HR	CY	CZ	DK	EE	FI	FR	DE	EL	HU	IE	IT	LU	LV	LT	MT	NL	PL	PT	RO	SK	SI	ES	SE	UK
Accommodation and food services	34%	26%	13%	64%	-	46%	0%	26%	2%	0%	60%	9%	3%	59%	5%	-	44%	7%	7%	17%	35%	20%	-	1%	27%	5%	0%	-
Publishing services	42%	37%	15%	6%	-	71%	20%	11%	6%	10%	10%	25%	7%	0%	3%	-	0%	2%	2%	12%	44%	16%	-	31%	26%	13%	12%	-
Telecommunications services	1%	26%	1%	13%	-	16%	11%	0%	6%	5%	7%	5%	9%	25%	4%	-	0%	10%	10%	7%	1%	12%	-	5%	17%	5%	1%	-
Computer programming, consultancy and related services; Information services	1%	11%	10%	11%	-	20%	21%	10%	21%	6%	18%	19%	13%	16%	5%	-	0%	6%	6%	13%	0%	10%	-	10%	14%	18%	14%	-
Financial services, except insurance and pension funding	24%	10%	10%	4%	-	3%	2%	6%	10%	4%	18%	12%	1%	33%	5%	-	0%	4%	4%	10%	22%	10%	-	30%	5%	12%	8%	-
Insurance, reinsurance and pension funding services, except compulsory social security	0%	7%	16%	9%	-	31%	7%	0%	5%	2%	3%	30%	1%	64%	40%	-	0%	10%	10%	8%	0%	22%	-	44%	4%	4%	1%	-
Services auxiliary to financial services and insurance services	0%	6%	0%	97%	-	0%	4%	0%	0%	0%	0%	0%	0%	0%	4%	-	0%	0%	0%	0%	0%	10%	-	9%	0%	2%	0%	-
Legal and accounting services; services of head offices; management consultancy services	0%	15%	24%	15%	-	25%	16%	71%	19%	4%	4%	6%	0%	5%	2%	-	0%	3%	3%	9%	0%	6%	-	3%	9%	3%	22%	-
Architectural and engineering services; technical testing and analysis services	1%	17%	30%	16%	-	2%	10%	1%	2%	14%	16%	4%	1%	15%	8%	-	0%	1%	1%	13%	1%	10%	-	5%	6%	4%	6%	-
Scientific research and development services	0%	9%	40%	0%	-	0%	26%	0%	0%	0%	0%	1%	0%	94%	15%	-	0%	0%	0%	0%	0%	2%	-	0%	0%	0%	0%	-
Advertising and market research services	0%	29%	4%	29%	-	11%	23%	9%	47%	21%	20%	5%	3%	91%	7%	-	0%	0%	0%	13%	0%	7%	-	2%	38%	5%	18%	-
Other professional, scientific and technical services and veterinary services	0%	9%	0%	15%	-	4%	10%	21%	4%	0%	10%	11%	2%	83%	8%	-	1%	37%	37%	14%	0%	9%	-	62%	28%	0%	23%	-
Travel agency, tour operator and other reservation services and related services	0%	8%	64%	7%	-	22%	67%	0%	31%	0%	0%	0%	0%	0%	0%	-	0%	11%	11%	0%	0%	2%	-	0%	54%	6%	0%	-
Rental and leasing services	1%	18%	50%	13%	-	42%	5%	6%	33%	17%	4%	15%	18%	100%	7%	-	1%	7%	7%	31%	1%	10%	-	22%	57%	20%	17%	-
Employment services	0%	4%	0%	0%	-	2%	1%	58%	16%	0%	3%	0%	0%	0%	7%	-	0%	0%	0%	1%	0%	0%	-	0%	0%	0%	0%	-
Security and investigation services; services to buildings and landscape; office administrative, office support and other business support services	0%	16%	0%	0%	-	7%	5%	5%	0%	16%	2%	3%	0%	0%	3%	-	0%	0%	0%	1%	0%	2%	-	0%	0%	8%	5%	-
Public administration and defence services; compulsory social security services	0%	0%	0%	0%	-	0%	1%	0%	0%	0%	0%	0%	1%	0%	0%	-	14%	0%	0%	0%	0%	0%	-	0%	1%	0%	0%	-
Education services	0%	0%	4%	1%	-	0%	0%	0%	0%	0%	0%	0%	0%	0%	0%	-	0%	0%	0%	0%	0%	0%	-	1%	0%	0%	0%	-
Human health services	0%	0%	2%	0%	-	0%	0%	1%	0%	0%	0%	0%	1%	0%	0%	-	0%	0%	0%	0%	0%	0%	-	0%	0%	0%	0%	-
Imputed rents of owner-occupied dwellings	0%	0%	0%	0%	-	0%	0%	0%	0%	0%	0%	0%	0%	0%	0%	-	0%	0%	0%	0%	0%	0%	-	0%	0%	0%	0%	-
Residential care services; social work services without accommodation	0%	0%	0%	0%	-	0%	0%	0%	0%	0%	0%	0%	0%	0%	0%	-	0%	0%	0%	0%	0%	0%	-	0%	0%	0%	0%	-
Real estate services excluding imputed rents	0%	0%	0%	0%	-	1%	0%	9%	0%	0%	0%	0%	0%	0%	0%	-	0%	0%	0%	0%	0%	1%	-	0%	0%	0%	0%	-
Creative, arts, entertainment, library, archive, museum, other cultural services; gambling and betting services	0%	1%	0%	1%	-	0%	1%	0%	0%	0%	0%	4%	0%	20%	0%	-	0%	1%	1%	0%	0%	12%	-	0%	0%	0%	0%	-
Sporting services and amusement and recreation services	0%	0%	12%	20%	-	0%	0%	0%	0%	0%	0%	7%	0%	8%	0%	-	0%	0%	0%	0%	0%	0%	-	6%	1%	0%	0%	-
Services furnished by membership organisations	0%	1%	0%	0%	-	0%	0%	0%	0%	0%	0%	0%	0%	0%	0%	-	0%	0%	0%	0%	0%	0%	-	0%	0%	0%	0%	-
Repair services of computers and personal and household goods	0%	27%	0%	0%	-	9%	0%	0%	0%	0%	0%	8%	0%	0%	24%	-	0%	0%	0%	3%	0%	0%	-	0%	0%	1%	0%	-
Other personal services	0%	1%	0%	0%	-	3%	0%	0%	0%	25%	0%	0%	0%	0%	0%	-	0%	0%	0%	0%	0%	1%	-	0%	0%	8%	0%	-
Services of households as employers; undifferentiated goods and services produced by households for own use	0%	0%	0%	0%	-	0%	0%	0%	0%	0%	0%	0%	0%	0%	0%	-	0%	0%	0%	0%	0%	0%	-	0%	0%	0%	0%	-
Services provided by extraterritorial organisations and bodies	0%	0%	0%	0%	-	0%	0%	0%	0%	0%	0%	0%	0%	0%	0%	-	0%	0%	0%	0%	0%	0%	-	0%	0%	0%	0%	-
Total	6%	4%	10%	5%	-	9%	5%	9%	5%	5%	4%	9%	8%	12%	3%	-	10%	5%	5%	4%	6%	9%	-	11%	7%	5%	4%	-

Source: London Economics based on Eurostat and national statistical institute data.
Notes: Stronger green shades represent products with a higher share of import penetration in public sector use in the respective column country. UK, Luxembourg & Romania are excluded as public sector import consumption is not available.

6.3. Methodology for determining direct and indirect cross-border procurement

6.3.1. Overview of matching results

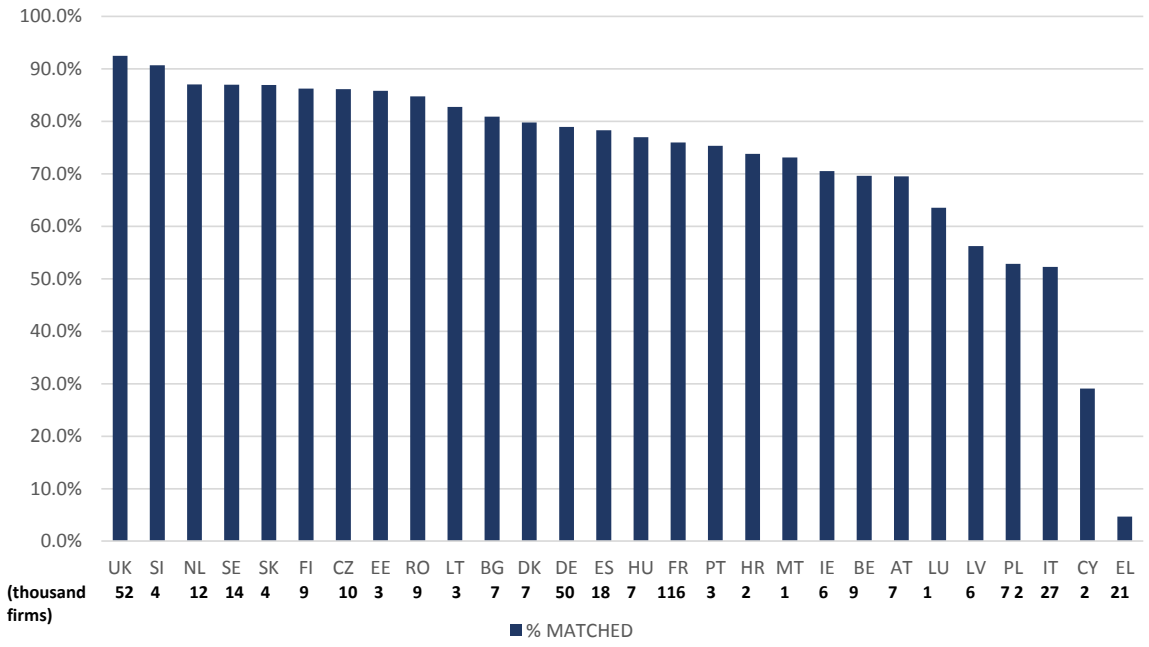
The matching of the firm names between the TED database and the Orbis database, where firm ownership information is contained, is a crucial component of the analysis in this report. At the end of this process, a quite successful matching rate was achieved, however, the **match rates of firms across different countries and the success of the different matching techniques is varied across countries**.

The match rate of firms varies by country between 92.5% in the UK and 4.7% in Greece. However, with the exception of Greece and Cyprus, all countries have a match rate of firms over 50% and 20 countries out of the 28 EU Member States have a firm match rate of over 70% demonstrating that the data matching was generally successful.

While Cyprus has an overall firm match rate of 29.1%, the firm match rate is reasonably high for companies recorded in Latin characters but remains low for those recorded in non-Latin characters.

Greece has an even lower firm match rate at just 4.7%: this is due partly to the issues associated with non-Latin characters but is also due to the fact that the Orbis database contains a relatively small proportion of Greek firms (Please see annex 6.4 for a more in-depth discussion).

Figure 38: Final match rates of firms, per country of successful bidder



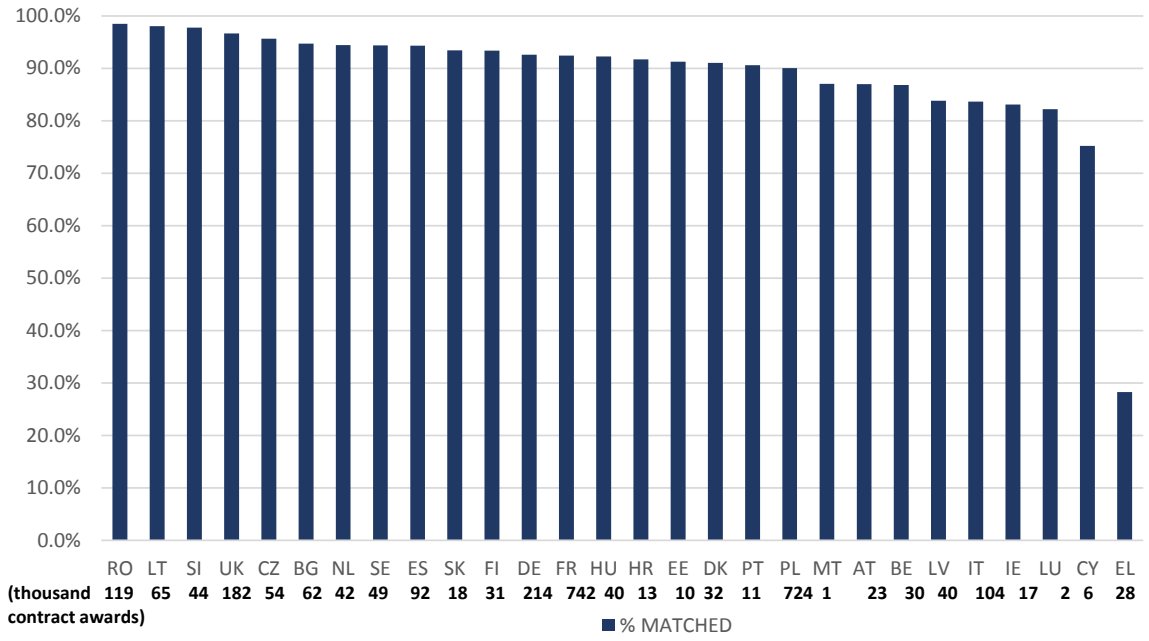
Source: London Economics based on TED transactions and Orbis database.
Note: Thousand firms refers to the total number of firms in the TED database for the respective country.

The number of unique successful bidders differs by Member State. It is therefore interesting to consider, not only the match rate of firms at the Member State level, but also the match rate of contract awards.

The match rate of firms, above, translates into a **high match rate of contract awards in the majority of Member States,** with a match rate of over 80% in 26 out of the 28 EU Member States.

Indeed, only two countries have match rates of contract awards below 80%: Cyprus and Greece.

Figure 39: Final match rates of contract awards, per country of successful bidder (repeats Figure 3 from section 3)



Source: London Economics based on TED transactions and Orbis database.
Note: Thousand of contract awards refers to the total number of contract awards in the TED database for the respective country.

6.3.2. Split the datasets by country (STEP 0)

From the TED database, all the successful contract bidders from the same country[72] are analysed together, for each country in the EU28. Within any given EU28 country, all firms from the Orbis database are also identified.

The motivation to separate the firms by country is that it is important that firms are matched with the firm from the right country, to accurately assess the amount of direct and indirect domestic and foreign procurement. In addition, there are many country specific issues that hamper the matching of names. For instance, company designators, such as "Limited", "Ltd", "SA", or "BV" are frequently country dependent.

An immediate problem is that winner firm's country information is missing in 479,045 contract awards out of the 3,359,554 unique contract awards in the database. To address this issue, various contact detail fields (telephone and fax, website and email, postcode, town, street name with postcode) and firm names uniquely belonging to a country are used to assign country. This was successful for companies in 245,891 unique contract awards, leaving 233,154 contract award winners without a country code.

72 Firms are classified by country of origin rather than by the procurement authority issuing the notice.

Table 61: Techniques used to match award winners to a country

Match	Criteria used	Approximate amount recovered
Telephone and fax	Country code from telephone or fax number match	4%
Website URL	Website has a country code associated with it	1%
Postcode only	NL, UK, IE, PL, MT, LV, LT, SI only	2%
Town	Identifies the town of the winner	20%
Street name & postcode	France only	9.5%
Identical name	If name matches to another name in only a single country	17.5%
Total recovery		54%

Percentages report as a percentage of all awards missing.
Source: London Economics based on TED transactions.

It is not possible to match these remaining contract awards, as the amount of matches with the wrong country could substantially bias the results of cross-border procurement upwards. Indeed, assigning contract award winners' country involves a trade-off between introducing bias and reducing the sample of contract awards. Incorrect attribution of country is likely to upward bias cross-border procurement given that the majority of procurement is domestic. To avoid this source of bias, **only contracts with sufficient information about the country of origin were attributed to a country.**[73]

6.3.3. Clean datasets for an exact match (STEP 1)

There is a lot of variation in the spelling of companies. As a result, this step aims to standardise names to facilitate exact matches.

Box 1: "Cleaning" of company names

The first step is to rename/reformat the variables in question. This step is mainly for display purposes, but useful when checking that everything is working properly at various stages of the matching process. The steps are as follows:

- Drop any variables or observations that are entirely empty
- Shorten names
- Convert all variables to string
- Remove entries that do not relate to the field they are entered in
- Format string display length
- Standardises company information, with the following sub-steps:
    - Trim and lowercase all relevant variables
    - Replace html codes with appropriate punctuation, symbol, etc. e.g. The Architects' Journal becomes the architects' Journal
    - Use trading name of company (i.e. portion of name following T/A) e.g. Skincare Laboratories Ltd T/A Yllume becomes Yllume
    - Use portion of name that follows aka (i.e. under the assumption that this is the name by which company is more commonly known) e.g. Process Systems

73 A possible opposing argument is that incorrect matches may be more likely when the successful bidder has a foreign presence. This could drive the direction of the bias downwards. However, the latter effect is likely to be smaller than the former (Please see section 6.4 for a further discussion of possible biases).

International Ltd (aka PSIL Pumps) becomes psil pumps

- Remove company designator (e.g. LTD, Limited, PLC, LLP, etc.)
- Replace & Co. with and company, and & with and
- Remove recorder comments from names (e.g. DUPLICATE DO NOT USE)
- Keep only alpha-numeric characters (remove all spaces, symbols and punctuation)
- Remove invalid company names that are frequently recorded (e.g. country names, free-lance, self-employed, no, etc.)

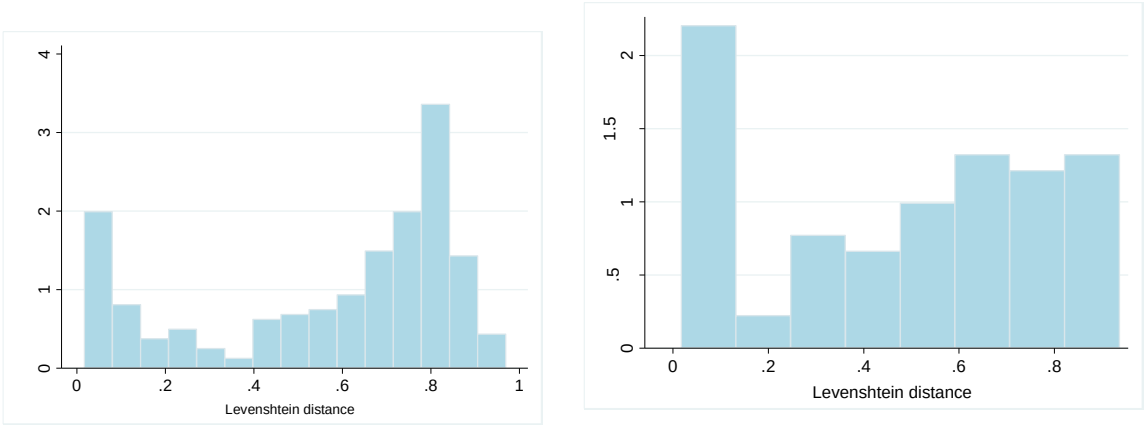
At this step, other fields are also used to identify inconsistencies in the recording of the same firms.

Companies with **either the same email address or same phone numbers** are assumed to be the same company and the most common spelling of the company name is taken to be the true name.

The postcode, fax, and alphabetic neighbours are then processed through a fuzzy match **using Levenshtein distance** *within* the TED database to clean the spelling errors. Levenshtein distance refers to the number of edits required to arrive from one word to another word as a proportion of the name length. The hypothesis is that two names which have a low pairwise Levenshtein distance are likely the same company, if these also share the same postcode or fax.

When the Levenshtein distance is plotted against the frequency of occurrence, a characteristic "U-curve" can be found, as the examples in the figures below illustrate. This suggests that there are two clear distinct camps: **on the left, firms that are different spelling variants of the same firm, on the right, firms that are in fact different firms. The group of firms on the right is dismissed and the less common spelling of the firms in the left is replaced with the most common spelling**.

Figure 40: Levenshtein distance: Postcode (left); Fax (right)



Source: London Economics based on TED transactions.
Note: Example of Levenshtein distance for TED companies in Portugal.

It remains possible that not all firms with similar enough name spelling, email address, fax number or postcode are in fact the same firm. So this procedure involves a trade-off between matching a greater number of firms and the possibility of introducing some errors. This is similarly the case throughout the several steps of the matching methodology discussed in this

annex. This trade-off is of concern mainly if the errors that are introduced are likely to cause a bias on the estimates of the cross-border shares.[74] In this step, the possibility of bias depends on whether the **accuracy of recording of several firm characteristics in the TED database correlates with the respective firms being domestic or foreign**. Since there is no reason to believe this to be the case, then the presence of some incorrect matches will not introduce any bias in the results.

Box 2: Code excerpt: cleaning through a Levenshtein distance

```
	* we match fuzzily with: I) postcode II) FAX III) alphabetic neighbours
	* we match straight with url, email and phone numbers

	* postcode
		// keep first postcode only
		replace win_postal_code = substr(win_postal_code,1,5) if strpos(win_postal_code,"/") == 7
		replace win_postal_code = "" if strlen(win_postal_code)<5
		// the idea is to look at postcodes and do a pairwise comparison within each postcode
		*inverse sort, such that 1 is the most common firm name, 2 the second, etc., per postcode
		gsort -count_stan_name stan_name_len
		sort win_postal_code, stable
		quietly by win_postal_code: gen nou_firms_per_postcode = cond(_N==1,0,_n)
		forvalues i = 1/4 { // compare with the top 4 most common names per postcode
		quietly by win_postal_code: gen stan_name_`i' = stan_name[`i'] if win_postal_code != ""
		}
		forvalues i = 4(-1)1 {
		strdist stan_name stan_name_`i', gen(levenshtein_postcode_`i')
		gen levenshtein_postcode_pct_`i' = levenshtein_postcode_`i'/strlen(stan_name)
		}

		*visualise
		hist levenshtein_postcode_pct_1 if levenshtein_postcode_pct_1 < 1 & levenshtein_postcode_pct_1 != 0
		graph export "$sys\data cleaning\TED and SME Orbis EU data control\\`country'_`dataset'_postcode.emf",replace

		* replace the entries with the most popular different one that matches
		* long names allow larger changes
		gen Lsuggest_postcode_1 = stan_name_1 if levenshtein_postcode_pct_1 < 0.5 & levenshtein_postcode_pct_1 != 0 // most popular is a suggestion if a close match
		gsort win_postal_code -Lsuggest_postcode_1
		quietly by win_postal_code: gen Lsuggest_replace_1 = Lsuggest_postcode_1[1]
// we note that the most popular has been suggested to at least one
		gen Lsuggest_postcode_2 = stan_name_2 if levenshtein_postcode_pct_2 < 0.5 & levenshtein_postcode_pct_2 < levenshtein_postcode_pct_1 & levenshtein_postcode_pct_2 != 0 & stan_name != Lsuggest_replace_1
		gsort win_postal_code -Lsuggest_postcode_2
		quietly by win_postal_code: gen Lsuggest_replace_2 = Lsuggest_postcode_2[1]
		gen Lsuggest_postcode_3 = stan_name_3 if levenshtein_postcode_pct_3 < 0.5 & levenshtein_postcode_pct_3 < levenshtein_postcode_pct_1 & levenshtein_postcode_pct_3 < levenshtein_postcode_pct_1 & levenshtein_postcode_pct_3 != 0 & stan_name != Lsuggest_replace_1 & stan_name != Lsuggest_replace_2
		gsort win_postal_code -Lsuggest_postcode_3
		quietly by win_postal_code: gen Lsuggest_replace_3 = Lsuggest_postcode_3[1]
		gen Lsuggest_postcode_4 = stan_name_4 if levenshtein_postcode_pct_4 < 0.5 & levenshtein_postcode_pct_4 < levenshtein_postcode_pct_1 & levenshtein_postcode_pct_4 <
```

74 In other words, there is an important distinction between introducing "noise" and introducing "bias". Noise is less of a concern when the number of observations is large, as is the case here. Bias is of course the greater concern and this is carefully considered at each step of this annex.

```
levenshtein_postcode_pct_2 & levenshtein_postcode_pct_4 < levenshtein_postcode_pct_3 & levenshtein_postcode_pct_4 != 0 & stan_name != Lsuggest_replace_1 & stan_name != Lsuggest_replace_2 & stan_name != Lsuggest_replace_3

                gen Lsuggest_postcode = ""
                forvalues i = 1/4 {
                replace Lsuggest_postcode = Lsuggest_postcode_`i' if Lsuggest_postcode == ""
                }

                gen levenshtein_pct_picked =,
                forvalues i = 1/4 {
                replace levenshtein_pct_picked = levenshtein_postcode_pct_`i' if Lsuggest_postcode_`i' == Lsuggest_postcode & Lsuggest_postcode != ""
                }

        * alphabetic neighbours
                // the idea is to mark suspicious items, then to correct them through a group distance
                *downward shift
                gen stan_name_n1 = stan_name[_n+1] // we shift the whole company list down one spot
                gen count_`var'_n1 = count_stan_name[_n+1] // we shift the number of duplicates down one spot
                strdist stan_name stan_name_n1, gen(levenshtein_n1) // we compare the normal with the shifted
                gen levenshtein_pct_n1 = levenshtein_n1/strlen(stan_name_n1)
                *upward shift
                gen stan_name_p1 = stan_name[_n-1] // same but the other direction
                gen count_`var'_p1 = count_stan_name[_n-1]
                strdist stan_name stan_name_p1, gen(levenshtein_p1)
                gen levenshtein_pct_p1 = levenshtein_p1/strlen(stan_name_p1)
                *group distance
                replace levenshtein_pct_p1 =, if levenshtein_pct_p1 == 0
                replace levenshtein_pct_n1 =, if levenshtein_pct_n1 == 0

                hist levenshtein_pct_p1 if levenshtein_pct_p1 < 1 & levenshtein_pct_p1 != 0
                graph export "$sys\data cleaning\TED and SME Orbis EU data control\\`country'_`dataset'_distance_p1.emf",replace
                hist levenshtein_pct_n1 if levenshtein_pct_n1 < 1 & levenshtein_pct_n1 != 0
                graph export "$sys\data cleaning\TED and SME Orbis EU data control\\`country'_`dataset'_distance_n1.emf",replace

                strgroup stan_name if levenshtein_pct_p1 < 0.2 | levenshtein_pct_n1 < 0.1, generate(group_levenshtein) threshold(0.2)
                gsort group_levenshtein -count_stan_name
                quietly by group_levenshtein: gen Lsuggest_group_name = stan_name[1] if group_levenshtein !=,
```

6.3.4. Matching the cleaned dataset with the Orbis database (STEP 2)

In step 2, the cleaned database of TED firm names is matched with the Orbis database.

The proportion of firms that are matched is partly a function of the coverage in the Orbis database of firms and partly a function of the cleaning algorithms. **In total, over 1.8 million contract award winners or 83% of all contracts are identified through the Orbis exact matching algorithm - but with large differences between countries**.

Bulgaria, Cyprus and Greece were manually cleaned and uploaded to the Orbis query tool as they are not recorded in Latin characters. While Bulgaria has a high match rate[75], Greece has a very low match rate. Cyprus has a reasonable match rate for companies written in Latin

75 The high match rate for Bulgaria is achieved due to National Identification Numbers.

characters but not for those in Greek characters. The potential consequences of this on the estimation of company ownership for Cypriot and Greek firms are discussed in section 6.4.

The match rate for other individual countries was also unsatisfactory so further data cleaning was undertaken to improve the match rate.

For instance, further features of the data were dealt with, such as text trailing the company names (e.g. "xx", "ou", "eesti")), text before the company names (e.g. "xx", "%en%", "%-%", "[1-9]\."), replacements (e.g. ",%s." ".%s.") and National Identification Numbers such as national registration or VAT codes

Moreover, any consortiums were split by saving each consortium member as a new observation. To split the consortiums efficiently, the common notation for consortiums within each country was identified. For instance, regular expressions (e.g. "consorcio", "C\O") were used to split award winner names. It was then assumed that the address details belonged to the first consortium member. The first consortium member retains the country of the winner, while the other consortium members are stripped from the address details.

Other consortium members were not considered any further, as without knowledge of the country of the firm, on the basis of the name alone, it would be likely to get a large amount of false positive matches. This would result in an upward bias to estimates of cross-border procurement. On the other hand, a bias in a different direction may result if the primary consortium member tends to have different characteristics to other consortium members. This issue is explored in greater detail in section 6.4.

Cleaned contract awards and consortium members are uploaded to the server and over 500 thousand further contract awards are matched.

Aside from the aforementioned issues with the consortium entries, bias will be introduced at this stage if the data cleaning method impacts the probability of a firm being matched differently depending on whether it is domestic or foreign. However, this issue is unavoidable: whichever database is used to match the contract awards there will always be a bias towards the characteristics of firms which are included in that database.

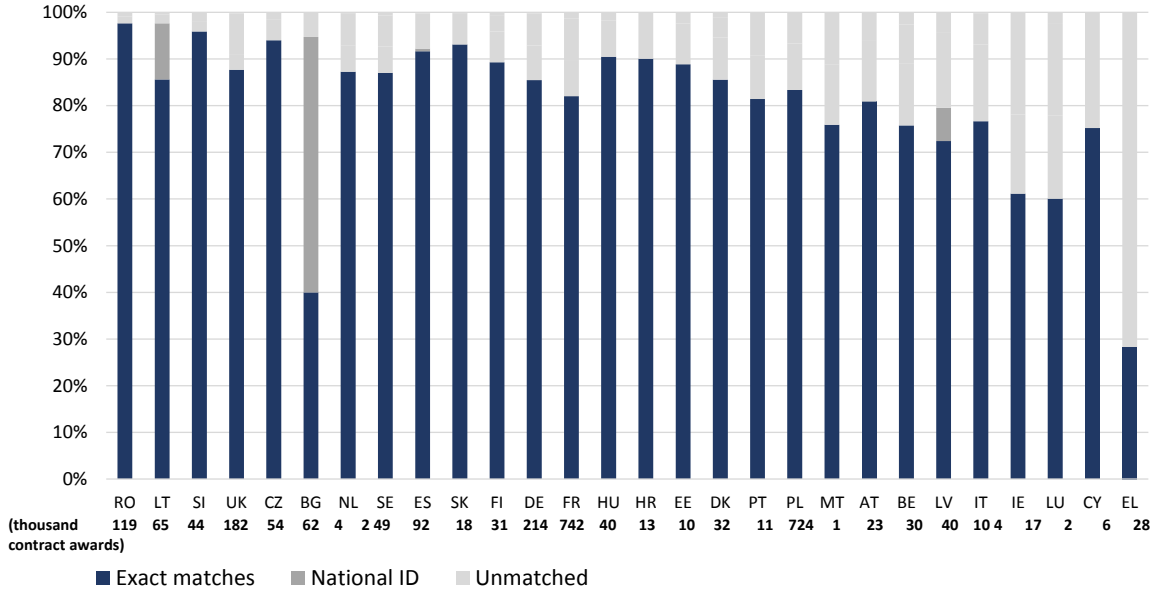
Box 3: Sample code to split the consortiums

```
	* discover the common notation
	preserve
	freqindex stan_name_seperate
	save "$sys\data cleaning\TED and SME Orbis EU data control\\`country' unmatched and tried freq.dta",replace
	restore

	* note indicators that prevent matches
		* reliable indicators of consortiums
		local indicator_s "xx" "%en%" "%-%" "[1-9]\." "[1-9]\%" "\(?[1-9]\)" "/" "\,|%en%" "/" "%/%" "%e%" "\%agrupamento" "\%[1-9].%" "[1-9]\." "|" ";" "/" "\\[]" "+" "[1-9]\." "\(?[1-9]\)" "/" "—" "mandante" "mandataria" "%con%" "%rti%" "%ati%" "%e%" "\,|%e%" "in%rti%con" "/" "-" "+" "-" "-" "+" "," ";" "[1-9]\." "\(?[1-9]\)" "—" "/" "-" "%/%" "%v%" "+" "," "%-%" "%–%" ";" "/" "%ja%" "/" "," "/" ";" "%mit%" "-" "," ";" "|" "/" "," "%$%" "/" "+" "in%joint%venture%with" "—" "," "-" "—" "/" ";" "-" "–" "," "/" ";" "%es%" "avec" "[1-9]\." "\(?[1-9]\)" "+" "/" "-" "—" "in%asociere%cu" "[1-9]\." "\(?[1-9]\)" "–" "-" "," ";" "," ";" "/" "," "–" "[1-9]\." "–" ";" "," "-" "/" "%i%" "–" "/" "[1-9]\." "[1-9]\." "\(?[1-9]\)" ";" "+" "–" "%a.%" "%oraz%" "%i%" "%sa%" "%ar%" // indicator
		local indicator_sc "XX" "NL" "NL" "NL" "NL" "NL" "NL" "NL" "LU" "LU" "MT" "PT" "PT" "PT" "PT" "PT" "PT" "IE" "IE" "IE" "IE" "IE" "IE" "IT" "IT" "IT" "IT" "IT" "IT" "IT" "IT" "IT" "IT" "IT" "IT" "IT" "BE" "BE" "BE" "BE" "BE" "BE" "BE" "BE" "SI" "EE" "CZ" "CZ" "CZ" "CZ" "CZ" "CZ" "CZ" "FI" "FI" "FI" "UK" "UK" "DE" "DE" "DE" "DE" "DE" "DE" "DK" "DK" "DK" "DK" "DK" "DK" "ES" "ES" "ES" "ES" "ES" "HU" "HU" "HU"
```

```
"HU" "HU" "HU"      "FR" "FR" "FR" "FR" "FR" "FR" "FR"       "RO"  "RO"  "RO"  "RO"  "RO"  "RO"
    "LT" "LT"       "AT" "AT" "AT" "AT" "AT" "HR" "HR" "HR" "HR" "HR" "HR"        "SK"
    "SE" "SE"       "PL" "PL" "PL" "PL" "PL" "PL" "PL" "PL" "PL"       "LV" // country

            * select the relevant country
            foreach char in "t" "b" "s" "r" {
            local indicator_`char'cc: word count `indicator_`char''
            local indicator_`char'ccc: word count `indicator_`char'c'
            if "`indicator_`char'cc'" != "`indicator_`char'ccc'" { // control as many countries
are listed as indicators
            display as error "ERROR: indicator_`char'c is `indicator_`char'cc',
indicator_`char'cc is `indicator_`char'ccc'"
            exit 111
            }
            else { // select the relevant country with indicators
            forvalues i = 1/`indicator_`char'cc' {
            local `char'_c `: word `i' of `indicator_`char'c''
            local `char'_n `: word `i' of `indicator_`char''
            if `"`char'_c'"' == "`country'" {
            local indicator_`char'`country' `indicator_`char'`country'' ``char'_n'
            }
            }
            }
            }

* separate the consortiums
    * find position seperation character (and number of seperation characters)
    local c = 0
    foreach consort in `indicator_s`country'' { // for each seperation character
    local c = `c'+1
    if regexm("`consort'","\\") == 1 {
    moss stan_name_seperate, regex match("(`consort')") prefix("S`c'") // contains regular
expression
    quietly sum S`c'count if S`c'count != 0
    display "`consort' identified: `r(N)' consortia"
    }
    else {
    moss stan_name_seperate, match("`consort'") prefix("S`c'") // does not contain regular
expression
    quietly sum S`c'count if S`c'count != 0
    display "`consort' identified: `r(N)' consortia"
    }
    }
    * combine into single separator
    gen _count = S1count if S1count < 10 // generate the single separator (using the first
separator)
    forvalues j = 1/10 {  // we consider consortiums of up to 10 participants - the rest are
most likely recording errors
    capture confirm variable S1pos`j'
    if !_rc {
    gen _pos`j' = S1pos`j' // generate the combined position (using the first separator if it
exists)
    }
    else {
    gen _pos`j' =,
    }
    }
    forvalues i = 2/`c' { // c possible consortium separators
    local k = `i'-1
```

```
    replace _count = S`i'count if S`i'count != 0 & (S`i'count >= S`k'count & S`i'count <
10) // combine separators - the one that seperates most (weak preference for separators
later in the list)
    forvalues j = 1/9 {
    capture confirm variable S`i'pos`j' // check if the separator exists
    if !_rc {
    replace _pos`j' = S`i'pos`j' if S`i'count != 0 & (S`i'count >= S`k'count & S`i'count <
10) // replace the position of the separator with the relevant separator position
    }
    }
    }

    * split and add consortiums
    sum _count
    forvalues i = 1/`r(max)' { // loop through the maximum amount of consortium
separators (i.e. 9 or less)
            * duplicate consortiums
            quietly sum _count if _count == `i',mean
            local j = `i'+1 // the number of consortium members in the consortium
            expand `j' if _count == `i', generate(copy_id_`i') // duplicate the observations
            replace copy_id_`i' = 1 if _count == `i'
            * note the order of the consortiums
            sort id_award copy_id_`i'
            quietly by id_award copy_id_`i': gen dup_exp_`i' = cond(_N==1,0,_n) if _count
== `i' // order of the consortium member in the consortium
            * keep the name of just one of the firms
            replace stan_name_seperate = substr(stan_name_seperate,1,_pos1-1) if
dup_exp_`i' == 1 // we store the first consortium member
            replace stan_name_seperate = substr(stan_name_seperate,_pos`i'+1,.) if
dup_exp_`i' == `j' // we store the last consortium member
            local m = `i' - 1
            forvalues k = 1/`m' { // we loop from the first separator to the penultimate
separator
            local l = `k'+1
            replace stan_name_seperate = substr(stan_name_seperate,_pos`k'+1,_pos`l'-
_pos`k'-1) if dup_exp_`i' == `l' // we take the second to the penultimate firm and seperate
them
    }
    }
    * remove consortium separators
    replace stan_name_seperate = "%"+stan_name_seperate // temporarily add a blank
space at the start
    local i = 0
    foreach consort in `indicator_s`country'' {
    local i = `i' + 1
    if regexm("`consort'","\\") == 1 {
    display "`consort'"
    replace stan_name_seperate = regexr(stan_name_seperate,"(`consort')","") if _count >
0 // contains regular expression
    }
    else {
    display "`consort'"
    replace stan_name_seperate = subinstr(stan_name_seperate, "`consort'", "",.) if _count
> 0  // does not contain regular expression }                    }
```

Figure 41: Step 2 match rate of contract awards, per country



Source: London Economics based on TED transactions and Orbis database.
Note: Bulgaria, Cyprus and Greece were matched manually on the Orbis server. They were not included in the consortium match.

6.3.5. Fuzzy match of the unmatched firms (STEP 3)

After all the previous steps have been performed, a significant number of unmatched firms remains. A 'fuzzy matching' algorithm is then used to match these remaining TED database firms with Orbis database firms from the same country.

The algorithm used is 'matchit' created by Julio Raffo (2015).[76] The algorithm focuses on the frequency of words in the companies' names for each country. To take as an example Ireland[77], common words in the company names as "Ltd" (present 4,357 times in TED for companies from Ireland), "Limited" (1,806), "Ireland" (1,578), "&" (1,306), "Services" (819), "Systems" (478), or "Group" (406) provide less useful information to identify the firm than rare words, such as "Alstom" (4), "Doolittles" (1), "O'Cleirigh" (2), or "Hewlett-Packard" (12).

According to the author, the algorithm "is particularly useful in two cases: (1) when the two columns/datasets have different patterns for the same string data; and, (2) when one of the datasets is considerably larger and it was fed by different sources, making it not uniformly formatted."

Therefore, it can be justified that the proposed fuzzy matching technique is appropriate to the present context. First, the nature of the fuzzy match is particularly conducive to identifying a firm in part of the same shareholder chain. For example, in Table 62, "COOK MEDICAL EUROPE LIMITED" is the fuzzy match for the TED company "Cook UK Medical", whose global ultimate owner (GUO) is Indiana, US, based "COOK GROUP INC.", the owner of multiple European "COOK MEDICAL" subsidiaries. Second, it is well suited for recording particularities of individual agencies who submit data, e.g. to ignore words as "Ltd.", "Joint Venture" or "Konsorcjum", that otherwise prevent matches. By comparing the usage of words in each country, it is possible to filter through generic phrases that were not removed in the previous iterations of data cleaning.

For each TED Company, the matching algorithm creates pairwise similarity scores between each TED firm and each listing in the Orbis database. The similarity scores are calculated using the formula:

76 Raffo, J. (2015). MATCHIT: Stata module to match two datasets based on similar text patterns. Statistical Software Components.
77 We selected companies based in Ireland for the convenience of the reader, as their names are predominantly in English, the size of the database is modest, and the match rates are fairly representative.

$$\frac{m}{\sqrt{s_1\, s_2}} \quad (1)$$

where m is the number of overlapping words, and s_1 and s_2 are the number of words in the first and second strings respectively, with weights:

$$w = \frac{1}{\log(f) - 1} \quad (2)$$

where w is the weighting applied to each word and f is the frequency of occurrence of the word.

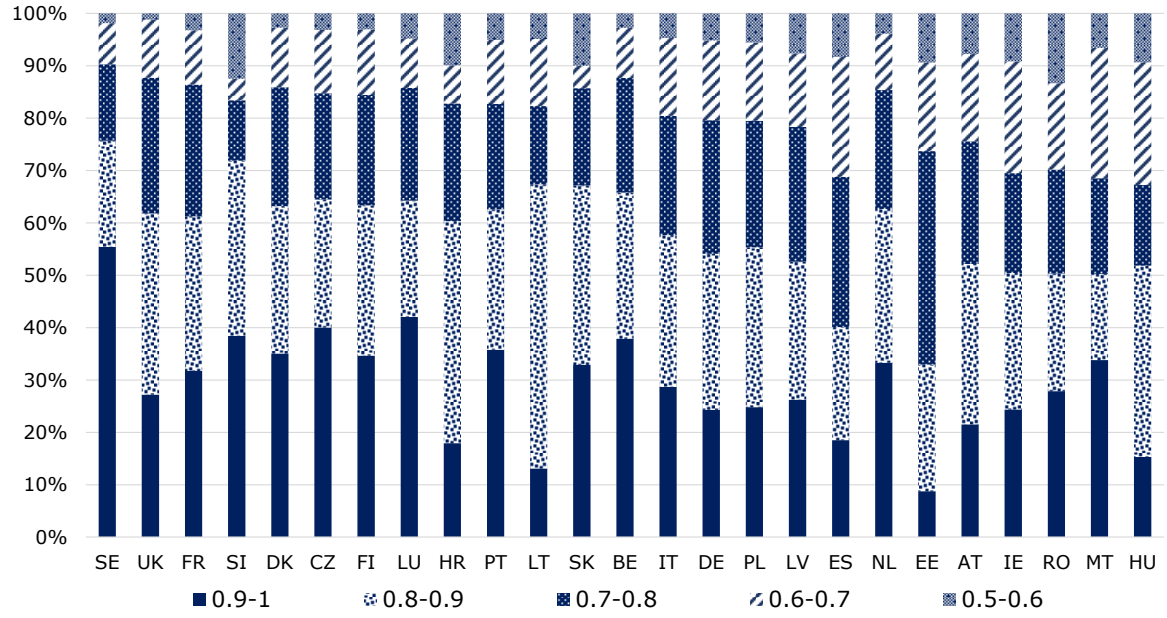
In other words, the similarity scores provide a measure of how similar the names of the contract winner in TED and all the firm names in the Orbis database are based on the number of words which occur in both firm names and the frequency with which these words appears in company names.

Similarity scores range between 0 and 1 where a higher score indicates greater similarity. As such, the Orbis company with the highest similarity score for each TED Company was kept as a match.

Due to computational limitations, only the company names have been used at this stage. The use of address and other available contact information would exponentially increase the computational time required.[78]

As there is no objective threshold for similarity scores, all similarity scores above 0.5 were initially considered. Between two-thirds and 9-out-of-10 matches had a similarity score of above 0.7, generally indicating a high level of similarity in the matches. However, the only way to assess the match quality is to investigate the actual matches.

Figure 42: Distribution of fuzzy match scores, as a % of fuzzy matches, per country



Source: London Economics based on TED transactions and Orbis database.
Note: Fuzzy matches for Bulgaria, Greece, and Cyprus were not undertaken due to problems with non-Latin characters.

Below is an example from Ireland, which illustrates a random selection of 20 firms in the middle of each cut-off similarity of the range[79] from the graph above. As can be seen below, across the

78 The same was true in relation to limiting the fuzzy match algorithm to full words only. Other matching techniques such as 2-grams, 3-grams, and phonetic were rejected due to their disproportionate computational requirements.
79 To get an overview of the match quality at different levels, four companies are randomly selected at the midpoint.

score, the fuzzy match significantly improves upon a random match with improvement in the similarity score.

Table 62: Example for Ireland of fuzzy match cut-off range

Name of successful bidder from TED	Fuzzy matched name from Orbis	Similarity score
Control & Information management Ltd (CIM)	CONTROL AND INFORMATION MANAGEMENT (CIM) LIMITED	0.55
Goodbody Stockbrokers, Matheson Ormsby Prentice	GOODBODY STOCKBROKERS	0.55
John Long Ltd.	JOHN LONG WORLDWIDE CABS LIMITED	0.55
Lynas Foodservices Ltd	ASHBOURNE FOODSERVICES LIMITED	0.55
Konsorcjuk firm: Aspen Pharma Ireland Limited, Nettle Pharma Services Sp. z o.o.	ASPEN PHARMA IRELAND LIMITED	0.65
Konsorcjum Firm: Aspen Pharma Ireland Limited, Nettle Pharma Services Sp. z o.o.,	ASPEN PHARMA IRELAND LIMITED	0.65
McGovern Surveyors	MCGOVERN CONSULTING LIMITED	0.65
Waterford Recovery Services	BUSINESS RECOVERY SERVICES LIMITED	0.65
Business Recovery Services Ltd. T/A Another 9	ANOTHER AVENUE LIMITED	0.75
Cook UK Medical	COOK MEDICAL EUROPE LIMITED	0.75
Gerald Purtill Energy Consulting	PURTILL CONSULTING ENGINEERS LIMITED	0.75
McDonnell Commercials Ltd.	MCDONNELL COMMERCIALS (MONAGHAN) LIMITED	0.75
Country Clean	COUNTRY CLEAN RECYCLING	0.85
S3 Alliance	S3 HOLDINGS LIMITED	0.85
Shoreline Graphics	SHORELINE TAVERNS LIMITED	0.85
Tom Doolans Garage	T & H DOOLANS TAVERN LIMITED	0.85
Chubb (Ireland) Limited	CHUBB IRELAND LIMITED	0.95
Kainos	KAINOS SOFTWARE LIMITED	0.95
Northlands	NORTHLANDS CONSTRUCTION LIMITED	0.95
Reddy O'Riordan Staehli Architects	REDDY O'RIORDAN STAEHLI LIMITED	0.95

Source: London Economics based on TED transactions and Orbis database.

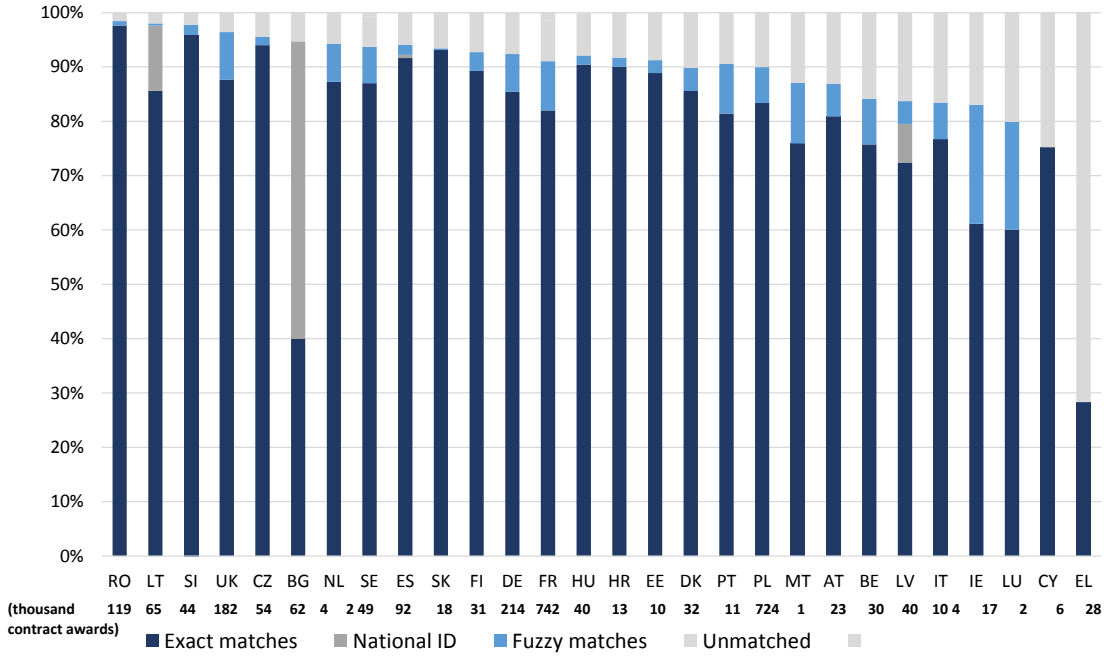
This illustrates how some of the matches - but far from all - below 0.7 contain different companies. Errors are also illustrated at scores above 0.7, but the expectation is that these will be much rarer. In order to avoid low quality matches, **fuzzy matches were accepted only where pairwise similarity scored above 0.7.** This was considered a reasonable compromise on the conflicting objectives of a high match rate and low matching error.

There are inevitably drawbacks to the methodology used. Fuzzy matching reduces the number of false negatives (no matches when there should be one) at the expense of false positives

(matches when there are none). ***A priori*, if false positives are randomly distributed, estimates of companies' ownership will be biased towards the population mean of the Orbis database.** An upward bias on foreign ownership will result if the proportion of foreign owned firms is higher in Orbis than in the TED data (and vice-versa). However, if this is not the case then increasing the number of false positives will only increase the imprecision of the results.

To assess whether including the fuzzy matches could be biasing the results, country level cross-border shares were computed with and without the inclusion of fuzzy matches based on different similarity scores. It is observed that the inclusion of fuzzy matches had very little impact on cross-border shares at the country level suggesting that no bias was introduced by this stage.[80] Overall, the fuzzy matching improves the match rate of contract awards to between 90-98% for 19 out of the 28 countries in the EU.

Figure 43: Final match rate of contract awards, by matching technique, per country



Source: London Economics based on TED transactions and Orbis database.
Note: Bulgaria, Cyprus and Greece were matched manually on the Orbis server. They were not included in the consortium match.

6.3.6. Summary of match steps

A full summary of the match rates of both firms and contract awards at the country level is provided in Table 63 below.

Table 63: Final match rates of firms and contract awards by matching technique, per country

	Contract Award level					Firm level				
Country	Exact match	Fuzzy match	National ID	Un-matched	Total	Exact match	Fuzzy match	National ID	Un-matched	Total
AT	18,329	1,395	0	3,110	22,834	4,396	496	0	2,141	7,033

80 A further minor drawback of this methodology is that it subsequently required downloading the Bureau van Dijk IDs of the company names which were matched. The reason this presents an issue is that 0.5% of firms could not be re-matched by Orbis despite the firm names originating from the Orbis server. For a further discussion on the bias that this may be introducing, see section 7.4.2.

	Contract Award level					Firm level				
Country	Exact match	Fuzzy match	National ID	Un-matched	Total	Exact match	Fuzzy match	National ID	Un-matched	Total
BE	23,406	4,195	0	6,746	34,347	5,067	807	0	2,559	8,433
BG	21,669	0	33,810	6,244	61,723	2,496	0	3,334	1,374	7,204
CY	630	0	0	926	1,556	630	0	0	1,534	2,164
CZ	50,948	887	0	2,434	54,269	8,564	242	0	1,415	10,221
DE	182,958	15,360	0	15,753	214,071	34,017	4,947	0	10,371	49,335
DK	27,037	1,682	0	2,869	31,588	5,314	435	0	1,455	7,204
EE	9,107	246	0	812	10,165	2,474	122	0	429	3,025
ES	83,435	2,111	595	5,627	91,768	12,979	788	53	3,825	17,645
FI	27,787	1,300	0	2,190	31,277	6,860	502	0	1,171	8,533
FR	602,699	77,181	0	54,751	734,631	72,081	12,853	0	26,851	111,785
GR	7,878	0	0	23,818	31,696	982	0	0	19,953	20,935
HR	11,700	216	0	1,068	12,984	1,384	81	0	520	1,985
HU	36,093	742	0	3,348	40,183	5,385	187	0	1,664	7,236
IE	10,089	3,856	0	2,834	16,779	2,938	1,235	0	1,744	5,917
IT	76,712	7,356	0	7,080	91,148	12,430	1,781	0	12,975	27,186
LT	54,329	270	7,795	749	63,143	2,404	50	376	590	3,420
LU	1,472	522	0	471	2,465	459	108	0	325	892
LV	28,866	1,701	2,840	6,474	39,881	2,751	401	209	2,617	5,978
MT	998	148	0	189	1,335	299	74	0	137	510
NL	36,172	2,711	0	4,185	43,068	9,688	1,138	0	1,607	12,433
PL	601,107	48,544	0	73,530	723,181	27,888	10,211	0	33,959	72,058
PT	9,044	1,045	0	1,109	11,198	2,249	218	0	807	3,274
RO	117,866	1,031	0	2,056	120,953	7,619	308	0	1,421	9,348
SE	42,004	3,016	0	2,767	47,787	10,642	1,119	0	1,760	13,521
SI	46,026	1,344	0	1,593	48,963	3,209	86	0	338	3,633
SK	16,145	60	0	401	16,606	3,540	24	0	534	4,098
UK	160,908	17,032	0	6,456	184,396	42,439	5,691	0	3,899	52,029

Source: London Economics based on TED transactions and Orbis database.

6.3.7. Distinguishing between foreign and domestic firms: (STEP 4)

This stage's objective is to attribute an ultimate owner to each of the companies identified in the previous stages. This is itself a process that takes 7 sub-steps. For reference, a more in-depth explanation of the concepts discussed in this section can be found in annex 6.4.

Sub-step 1: Take the country of the Global Ultimate Owner (GUO), by considering the GUO BvD ID/GUO BvD ID's:

- In case of a unique GUO or where the country of all GUOs is the same: **the country from the GUO/GUOs is taken.**

- In case of multiple GUOs with several countries: where data is available, the country from the GUO that represents the highest % total ownership or if total ownership is not available then % of direct ownership is taken.
- In case of multiple GUOs, of which only one has a country: **take country.**
- In case of multiple GUOs with several different countries: If the country of GUOs is different from firm origin, assign as foreign but do not assign a specific country.
- If it is not possible to distinguish whether the firm is foreign or domestic from the above steps, move on to Stage 2.

The control threshold used to identify the GUO is 25.01%: as a result, not all the GUOs identified will have majority control. This **may bias results if domestic or foreign firms are more or less likely to incorrectly match.** The reasoning underlying this choice is discussed in greater depth in section 6.4.

Sub-step 2: If country code GUO BvD ID is WW, YY, and ZZ[81] or if it was not possible to distinguish between countries in the previous step: the highest controlling shareholder (CSH) is considered.

- In case there is a single highest controlling shareholder: the country of the single CSH is taken.
- In case of multiple non WW / YY / ZZ GUOs: if all CSH are from the same country take that country.
- In case of multiple CSH with different countries which are all different to the country of origin: If GUOs countries are all different from firm origin, assign as foreign but do not assign a specific country.
- If still unassigned between foreign or domestic after the above steps, move on to Stage 3.

Sub-step 3: If country code GUO BvD ID is missing or if it was not possible to distinguish between countries in the previous steps: look at independence indicator

- If B or higher: Domestic

  No country is assigned in this step.

The logic for this is that if the independence indicator is B or higher, this indicates that no shareholder has an ownership percentage of more than 50% and that the company is not classified as a branch or foreign company. In turn, any firms with independence indicators of B+ or higher are effectively 'self-owned' and as a result are, by default, domestic.

Sub-step 4: If it was not possible to distinguish between countries in the previous steps, consider the shareholders:

- In case of a unique shareholder or where the country of all shareholders is the same: **the country from the shareholders is taken.**
- In case of multiple shareholders: where data is available, take the country from the shareholder that represents the highest % total ownership or if not available then of direct ownership is taken.
- In case of multiple shareholders, of which only one has a country: **take country.**
- In case of multiple shareholders with several countries, all of which are different to the country of origin: **If shareholders' countries are all different from firm origin, assign as foreign but no country assigned.**

81 WW identifies a natural person. However natural persons are not identified by WW, if their country is known. YY identifies companies with unknown/unrecorded countries. ZZ identifies companies owned by management, officers, and employees.

As with sub-step 1, the decision to take the largest direct shareholder increases the chance of incorrectly identifying ownership as the ownership identified may not reflect majority ownership: This may bias results if foreign or domestic firms are more or less likely to incorrectly match.

Sub-step 5: If shareholder information is missing, and company status is not active: repeat step 4 with the historical shareholders around the dissolution date.

Sub-step 6: If it was not possible to distinguish between countries in the previous steps, consider the standardised legal form.

1. In case the standardised company legal form is A. Sole trader/Proprietorship, B. Partnership, or C. Public authorities then assign country as **domestic**

2. In case the standardised company legal form is C. Foreign companies: **Foreign**

No country is assigned in this step.

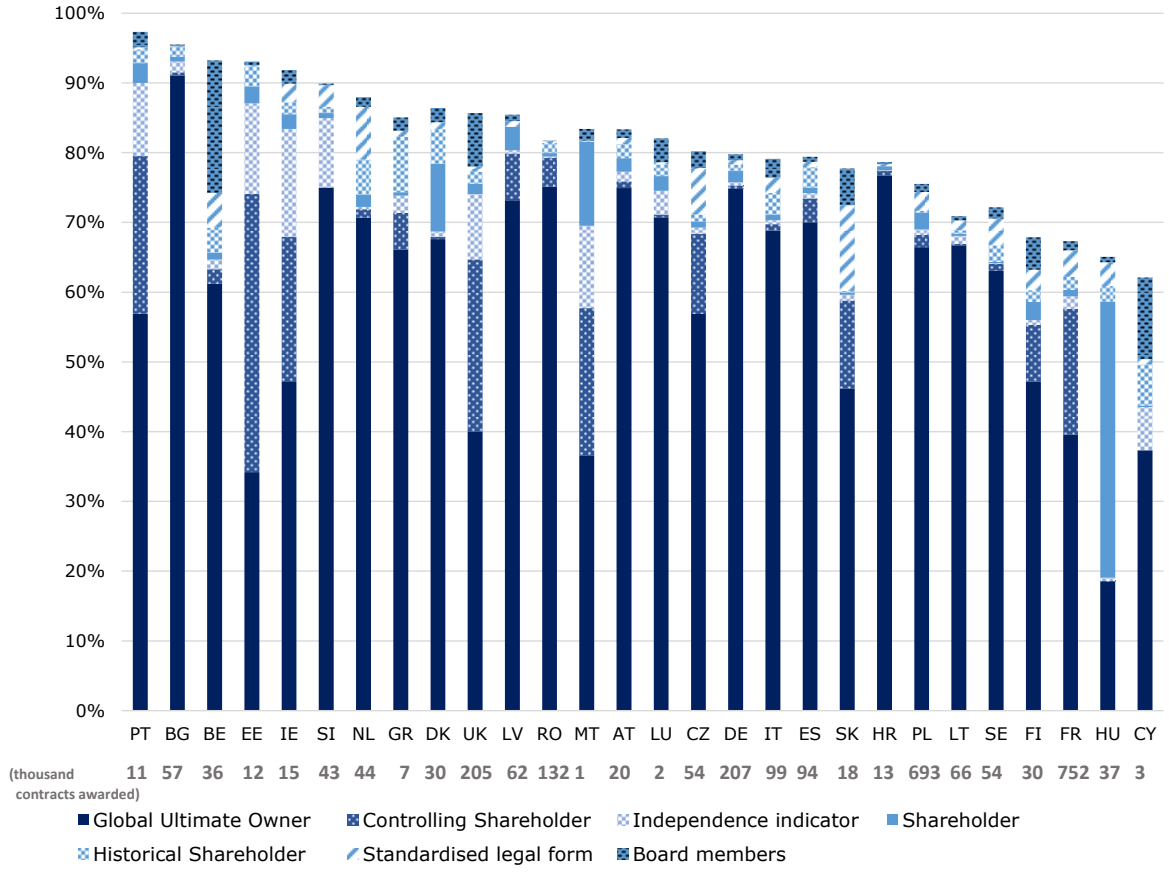
Sub-step 7: If it was not possible to assign country of ownership in the previous steps: identify nationality and country of board of directors and senior management.

- In case >50% are domestic: **Domestic**
- In case>50% are foreign: **Foreign**

No country is assigned in this step.

Sub-step 8: Allocate all remaining as domestic on a best effort basis.

Figure 44: Rate of successful assignment of ultimate owner, by ultimate owner assignment technique, as a % of contract awards, per country

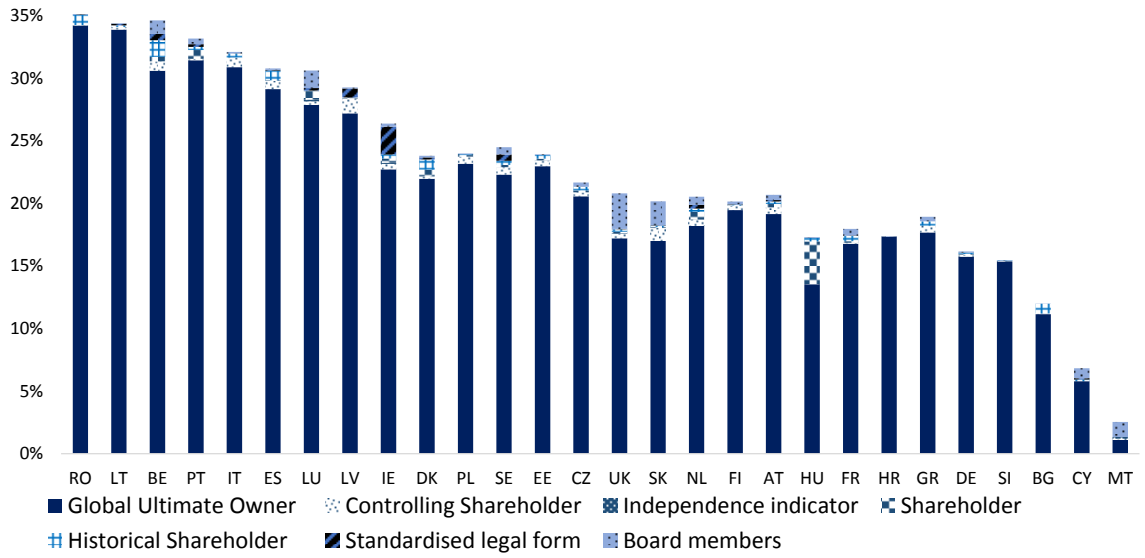


Source: London Economics based on TED transactions and Orbis database.

The figures above show the recovery of the ultimate owner in stages 1-7 by method used. Across these stages, approximately 66% of firms (76% of contract awards) were successfully identified as either foreign or domestic.

Out of the firms that were identified as foreign, 82% were identified through GUO information (corresponding to 95% of contract awards identified as foreign). This suggests that if GUO information is missing, then it is unlikely that the firm is foreign.

Figure 45: Rate of assignment of ultimate owner as foreign, by ultimate owner assignment technique, as a % of contract awards, per country



Source: London Economics based on TED transactions and Orbis database.
Note: % of all firms with a BvD ID that has a foreign owner of all matched contract awards.

As such, extrapolating from this finding, firms that were not allocated as foreign from the seven previous steps were allocated as domestic under a 'Best effort' basis. The reasoning for this is that as shown by Figure 45, despite the fact that sources needed to trace down the Ultimate Owner vary significantly by country, the foreign owned companies are nearly completely captured by just the GUO. As a result, although the assumption that all remaining firms are domestic will downwardly bias the level of indirect cross-border procurement, it appears to be more appropriate relative to disregarding these firms altogether.

Please see section 6.4 for a further discussion on bias which different stages of GUO identification may have led to.

6.3.8. Processing transactions (STEP 5)

PROCESSING THE MATCHED TRANSACTIONS

Consistent with previous EC[82] and Ramboll[83] studies, the implausibility of some of the contract award value in the TED database is dealt with by **limiting the sample of contract values to contract awards above 1,000 EUR and below 200,000,000 EUR.** This helps reduce the impact of extreme values on relative shares and also allows the current study to be comparable to the previous work by the EC and Ramboll. If contract values were not available, the notice value was taken if the award was unique. If there were several awards within a given notice, then the recorded value was maintained as missing.

Even though the contract value range has been limited, particularly high and low values may still have impacts on distorting estimates of the value of awards. As a result, shares of the number of contract awards are likely to be a more reliable measure of cross-border penetration than shares of the values of awards.

Contracts without contract values or extreme values were still included in calculations which relied on the number of awards.

Any cancelled lots were excluded from the analysis.

82 DG Trade economist notes, "Determinants of direct cross-border public procurement in EU Member States", July 2014.
83 Ramboll, "Cross-border procurement above EU thresholds", March 2011.

The data on the proportion of contracts subcontracted is of poor quality and has about 80% missing entries. As such, following advice from Commission experts, data on subcontractors has not been used in this report.

As the duration of awards was only available in approximately 25% of contract awards, this was not accounted for in the processing of data and the full value of contract awards was attributed to the year in which the award was issued.

Also, it is important to note that Croatia was only included as contract awarding country from 2013.

PROCESSING THE UNMATCHED TRANSACTIONS

Across the sample, 569,117 out of the 3,016,782 TED contract awards were not matched to firms in the Orbis database.

As mentioned in STEP 0 of the matching process, around 233,000 TED contract awards were not matched to firms in the Orbis database as it was not possible to identify the country of winner of the TED firms.

Of the remaining contracts, around 17,000 corresponded to contracts where the country of the awarding authority was different from the country of winner.

Therefore, these contract awards necessarily corresponded to either indirect domestic cross-border awards or direct cross-border contracts. As indirect domestic cross-border awards are known to represent a negligible fraction of the sample, all these contract awards were assumed to be direct cross-border contracts.

The approx. 320,000 contracts remaining, where country of authority was identical to the country of winner, therefore corresponded to either domestic or indirect cross-border contracts. However, the allocation as either domestic or indirect cross-border is not straightforward. If these contracts are removed altogether, this will overstate the shares of indirect and direct cross-border procurement as these firms are likely to be mostly domestic owned. As such, two alternatives were considered:

- Option 1: All contracts that are unmatched are assumed to be domestic on the basis that:

    1. A priori contracts are more likely to be domestic than foreign
    2. Foreign firms are more likely to be recorded in the Orbis database relative to domestic firms

The disadvantage of this option is that as countries have variable match rates for contract awards, the share of indirect awards will be impacted by the match rate in that country. Although most countries have similar match rates, this will have a substantive impact on the indirect cross-border shares in countries which have particularly low match rates such as Greece.

- Option 2: All unmatched contracts where country of contracting authority is the same as country of winner are assumed to have the same breakdown between domestic and indirect cross-border procurement as the unit of measurement in question.

    For instance, if in Italy 20% of the matched contracts where country of contracting authority is the same as country of winner are indirect cross-border awards, then it is assumed that 20% of the unmatched awards with country of contracting authority equal to country of award winner are indirect cross-border (and that the remainder are domestic).

The disadvantage of this approach is it is likely to overstate the share of indirect cross-border (as it can be argued that firms which we have successful matched are more likely to be foreign owned than those which have not been identified). Moreover, this approach will amplify any errors that have been made in determining whether firms are domestic or foreign in the matching.

As Option 1 is likely to impact the comparability of results over time and across countries more significantly than Option 2, in order to ensure that **results are as comparable as possible across the unit of measurement that is being considered, Option 2 was chosen.**

In order to assess the impact of this choice on the results, this trade-off is evaluated in more detail in section 6.4.

SIZE OF FIRM

In order to distinguish between large firms and SMEs, we focused on the approximately 1.4 million contract awards for which we had extended information which could be used to determine firm size.

This involved two main stages: first, determining whether firms qualified as SMEs and second, determining whether the firms identified as SMEs were in fact independent. Only SMEs not owned by other firms are considered SMEs for the purpose of this study.

Stage 1: Identification of SMEs

We first used the number of employees for latest available year to classify SME by size based on the rules of thumb outlined in the table below.

Secondly, where data was available, we used the firms' assets for the latest year available to verify our class intervals.

Firms were always classified as large unless all criteria for SME were met i.e. SME firms with assets above €43 million were re-classified as large.

Table 64: SME definition

Type of firm	Number of employees	Income	Assets
SME - Micro	0-10	Less than or equal to €2 million	Less than or equal to €2 million
SME – Small	10-49	Less than or equal to €10 million	Less than or equal to €10 million
SME - Medium	50-249	Less than or equal to €50 million	Less than or equal to €43 million
Large	250 and above	Above €50 million	Above €43 million

Stage 2: Identifying independent SMEs

In the second stage, we use a series of indicators to identify whether or not SMEs are independent:

Step 1: GUO BvD ID

If a firm's GUO has the same ID as itself then we assume the firm is independent. This is because this indicates that the firm is effectively owned by itself.

If several firms with different BVD IDs have the same GUO then, we assume that the firms with this GUO are not independent.

If this is not the case, move on to Step 2.

Step 2: Highest controlling shareholder

If a firm's highest controlling shareholder has the same ID as itself then we assume the firm is independent. This is because this indicates that the firm is effectively owned by itself.

Step 3: Standardized legal form

If the standardized legal form is available and corresponds to either a sole trader, a proprietorship, a partnership, or a public authority then assume the firm is independent.

If not, we move to step 4.

Step 4: GUO assets.

If GUO assets are available, then the following rule of thumbs are applied, if not move on to step 5.

- If GUO assets are worth less than 43 million EUR, then we assume the SME is independent
- If GUO assets are worth more than 43 million EUR, then assume non-independent

Step 5: Consolidated accounts

If the firm's accounts are consolidated or the firm is associated with a firm which has consolidated accounts, then we assume the firm is not independent.

If accounts are unconsolidated or no information is available, then move on to step 6.

Step 6: Independence indicator.

If the independence indicator is A or B,[84] then we assume the SME is independent. The logic for this step is that if the firm has no single owner with over 50% ownership then it is unlikely to be owned by a group and hence, it is likely to be independent.

This step may overlook firms where although there is no owner with majority ownership, a single owner may still have majority control. This is likely to bias the estimated share of independent firms downwards but not substantially.

Step 7: Number of firms in corporate group

For the remaining SMEs, which have yet to be classified, we use number of firms in the corporate group. If the only firm in the corporate group is the firm itself, then we can assume it is independent. If there is more than one firm in the corporate group, then we assume that it is not independent

Step 8: Assume remaining SME firms have the same breakdown between independent as the unit in question.

If we excluded these firms altogether, this would overstate the number of large firms in the sample. However, if we assume these firms are independent then we are likely to understate the number of large firms in the sample. In order to circumvent this issue, we simply assume that the remaining firms have the same breakdown between independent and non-independent SMEs as the unit in questions.

Step 9: Adjusting for bias

As the sample considered only contained firms with employment data available, this will likely understate the number of SMEs (as SMEs are less likely to have employment data recorded relative to large firms). To account for this, we re-weighted the number of SMEs in our sample using estimates of the bias calculated from random sampling. Please see section 6.4.4 in the annex for further details.

84 See annex 6.6 for the definition of the Orbis independence indicator.

6.4. Potential sources of bias

6.4.1. Overview

At the matching, identifying and processing stages of this study, the possibility of the selected approaches introducing biases in the assignment of firms' country of ownership has been a recurrent concern.

The table below gives a summary of some of the potential sources of bias which may be introduced at each stage of the matching and processing.

Table 65: Main sources of biases arising from different steps of the matching and processing

STEP	Procedure	Potential sources of bias
0	Split database by country and identify missing countries	Incorrectly classified countries could be biasing cross-border procurement upwards. If the characteristics of the transactions where the country of the winner is unknown differs from the sample as a whole this could lead to bias.
1	Preliminary data cleaning	Fuzzy data matching between firms using Levenshtein distance within countries may lead to bias if the characteristics that firms were matched on differ between foreign and domestic firms.
2	Exact matching	If foreign or domestic firms in TED are more or less likely to match firms in the Orbis database, then this could lead to bias in the results. This could be due to characteristics in the TED and/or the Orbis databases. For example: • Only a small number of Greek firms are included in the Orbis database (Approx. 134,000, for similar sized countries this is normally around 2 million) • Issues associated with matching Cyrillic characters • Consortium firms - only the first member of a consortium is included in the results.
3	Fuzzy matching	Fuzzy data matching may incorrectly match firms within the same country: this will lead to a bias if this process is impacted by characteristics of domestic or foreign firms. Fuzzy matched names are subsequently re-matched in the Orbis server to BvD IDs but 0.5% of new matches not identified.
4	Identification: identifying foreign or domestic firms	Assumption of "domestic" on a Best effort basis when ownership could not be identified is likely to understate the level of cross-border procurement. There were also issues associated with downloading additional data for particular firms. For example: • When fuzzy matched names were subsequently re-matched in the Orbis server to BvD IDs, 0.5% of firms were not identified. These firms are generally more likely to be branches. • There were issues involved with downloading ownership data for a subset of small French firms
6	Data processing	The threshold used to determine high and low awards may bias results if high/low awards are more likely to be foreign/domestic.

STEP	Procedure	Potential sources of bias
		Unmatched firms are assumed to have the same distribution of direct and indirect cross-border procurement as the unit of interest. This will upwardly bias the share of indirect cross-border procurement.

This summary illustrates that several stages of the matching and processing may be sources of biases, while the following subsections explore these issues in greater depth.

The aim of this section **is to make explicit several of the sources where a bias in the results may have been introduced**. In the limited amount of cases where it is possible, the assumptions used are tested, and this is used to make judgements on the trade-offs between having a larger sample and the risks of introducing bias.[85]

6.4.2. Evaluation of potential sources of bias in matches

This sub-section evaluates the most important decisions in the matching process which may have led to biases in the share of firms with foreign ownership recorded. This reflects the fact that **decisions in the matching process may impact the proportion of firms and value of tenders which are awarded that are considered to be foreign owned**.

Matches can be illustrated through a 2x2 matrix of correct and incorrect matched, matched and not matched firms.

Table 66: Types of matches

	Orbis: Correct firm	Orbis: Incorrect firm
TED: Matched	True positive match (TED firm is matched with correct Orbis firm)	False positive match (TED firm is matched with incorrect Orbis firm)
TED: Not matched	False negative match (TED firm is not matched with correct Orbis firm)	True negative match (TED firm is not matched and Orbis firm does not exist)

As shown by Table 66 above, some firms were matched correctly, some incorrectly, some were not matched while there was a match available, and some were not matched as there was no match available. Poor quality matches, e.g. fuzzy matches, will typically move those from the unmatched categories to the matched categories.

In turn, the bias in the results arises from a difference in likelihoods in both the unmatched and matched cases that certain TED firms will match with Orbis firms. In other words, incorrect matches reduce the precision of the results but do not cause bias. This is only introduced if foreign (or domestic) firms are more likely to correctly/incorrectly match. The mixture of matches in the matrix and the bias coefficients that result will depend on the matching method used.

To investigate this more explicitly, the model of the share of indirect foreign owned firms can be written as:

$$Foreign\ share = p\ X\ \gamma_x + (1-p)\ Y\ \gamma_y$$

Where p is the (unobserved) proportion of firms that are correctly matched ("True positive matches"), and its inverse $1-p$ is the proportion of firms which are incorrectly matched ("False positive matches"). X is the proportion of foreign firms in the correctly matched sample, while Y is the proportion of foreign firms in the sample with incorrect matches. γ_x and γ_y are the respective levels of bias in each.

85 It should be noted that the aim of this section is not to calculate the amount of bias. This is inherently impossible since if it were possible to calculate the bias, the bias could simply be removed in the first place. Neither is the aim to list all assumptions relative to which no discernible source of bias was introduced.

If $\gamma_x = \gamma_y = 1$**, there is no bias in the results** and no reason to be concerned about poor matches either, apart for the addition of white noise in the results. In this case, false negative and positive matches have no impact on the shares of foreign ownership.

However, there are reasons to be concerned about γ_x and γ_y, as the decisions used to match firms are also likely to impact the characteristics of both the matched and un-matched groups. Indeed, some decisions, e.g. fuzzy matching, are likely to increase the share of firms matched with the incorrect firm ("False positive matches") $(1-p)$ ↑, $(1 - \gamma)$ ↑, and impact the bias in both γ_x and γ_y in non-obvious ways.

There are reasons to believe that both the TED database and the Orbis database might lead to bias, γ_{xy}, in the sample of correctly matched firms if:

- Firms in the TED database are more likely to match if they are more (or less) likely to be foreign owned.

  For instance, a common source of poorly recorded firms in the TED database are firms listed as part of a consortium. In turn, if consortiums are more likely to be unmatched due to this poor recording and are also more likely to be domestic, then this would upwardly bias cross-border procurement. To investigate this, it was tested whether consortium leaders were more or less likely to be foreign owned than the rest of the sample. In turn, it was found that in all countries except Ireland and Luxembourg consortium firms were, indeed, less likely to be foreign-owned relative to non-consortium firms.

- **Firms in the TED database are more likely to match due to the features of firms in the Orbis database.** For instance, some firms in Orbis might be more difficult to match (e.g. small firms with long names or locations).

  Equally, the Orbis database does not contain every single firm: obviously, firms not present in the database cannot match with firms TED database. This is an issue if those not present in Orbis or less likely to match are, on average, different in their ownership. This is a possibility as those not available in Orbis may be more likely to be micro and small, domestically owned firms.

  As a control, the contract amount awarded was tested against the matching outcome. It was found that the contract award size did not have an influence on the likelihood of matching the firm.

While matching both the TED database and the Orbis database might lead to bias,γ_y, in the sample of incorrectly matched firms if:

- The share of foreign owned TED firms is different from the share of foreign owned firms in Orbis.

- The share of the firms from TED which are more likely to match (wrongly) are more or less likely foreign owned than other TED firms, or the Orbis counterpart more likely to match (wrongly) are more or less likely foreign than other Orbis firms.

The matching attempt involved a trade-off between γ_x and γ_y: the larger share of the TED database that belongs to the correctly matched firms (p), the less concern there should be in relation to the size of the bias γ_x. Indeed, if a perfect match is made for all of the firms, there will be absolutely no bias (i.e. bias $\gamma_x = 1$)).

The aim to achieve a perfect match for all firms and thus eliminate any possibility of a bias is a dominant rationale to have as many TED firms as possible matched with the Orbis database to have as much certainty in our results as possible.[86] However, the attempt to match every single firm might lead to a greater proportion of false positive matches, with bias γ_y.

86 We also increase the statistical certainty in our results, or efficiency of our results, as we use the maximum amount of information available and are thus less likely to have selected an unrepresentative (even if unbiased) sample of firms.

Specific examples for possible bias

ALLOCATION OF ORIGIN (STEP 0)

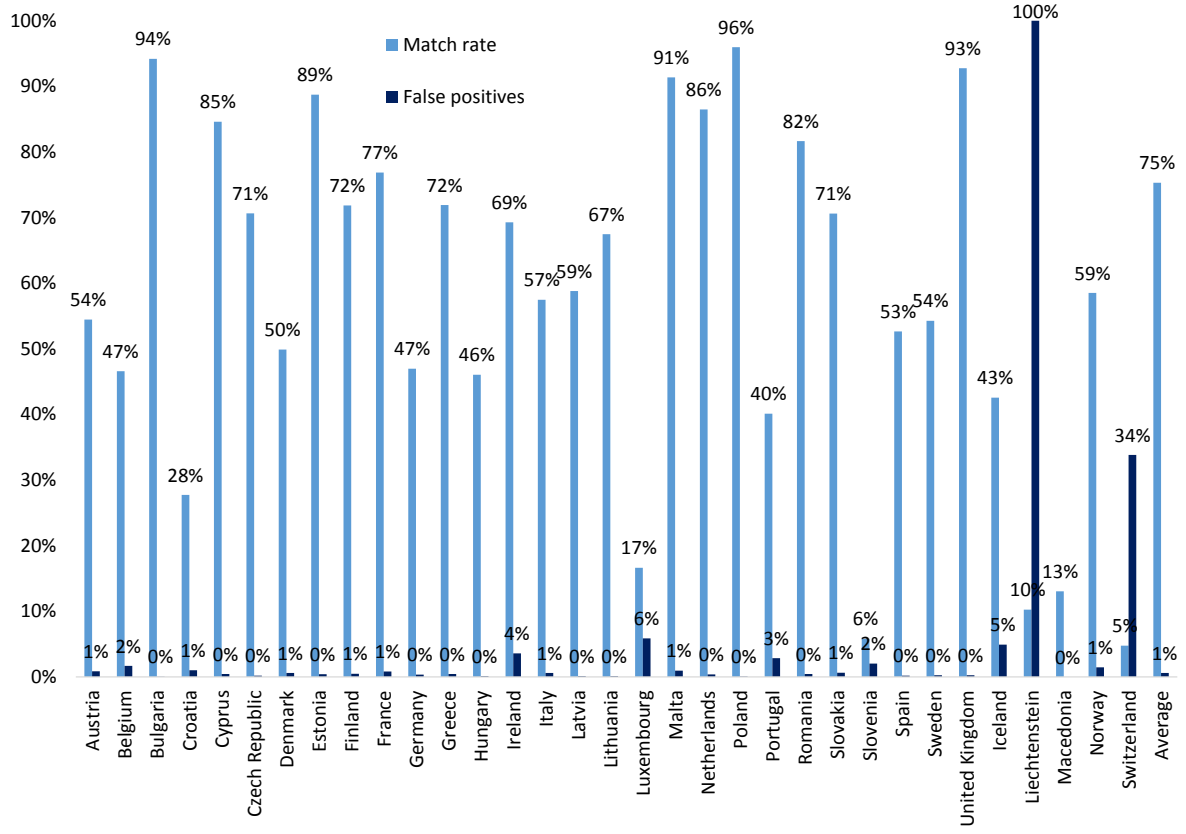
In most TED database contract awards, the country of the firm is known. This is either as it has been recorded or because the country has been recovered from various contact details.

However, a sizeable number of firms (479,045) do not have their country listed. This information was recovered in 245,891 unique contract awards, leaving 233,154 contract award winners without a country code.

To test whether recovering a country from contact details might have led to bias, a pilot test was used: country of origin was artificially removed from all companies with known origin to estimate the probability of a false match.

In this pilot, companies without their origin specified were rarely matched with companies of the wrong country. As shown in Figure 46 below, the average match rate with a firm from a different country was 1%.

Figure 46: False positive match rates without country specification



Note: Based on all contract awards with False positives denote a different country in the match than original.
Source: London Economics based on TED transactions and Orbis database.

Between countries these false match rates varied substantially, with higher false match rates in smaller samples which share a common language with other Member States e.g. Ireland, Luxembourg. In general, non-EU countries were most likely to be incorrectly matched although it should be noted that because relative few matches were made for these countries – the high percentages of incorrect matches are not a major cause for concern.

However, provided foreign direct procurement only accounts for a small share of all procurement, even small false match rates are likely to lead to a substantial overstatement of the direct foreign procurement.

FRENCH FIRMS

There are 6,070 small French firms, which were matched exactly to firms in the Orbis database whose data is heavily monitored by Bureau van Dijk, which restricts the downloading of their information.

From these 6,070 firms, in 3,697 firms it was possible to confidently determine that these are domestically owned French firms representing 61% of firms with data restrictions (mainly sole traders, through standardised legal form, i.e. sole trader/proprietorship, partnerships, or public authorities, and a filter of independence indicator, i.e. self-owned). While for 749 firms, or 12%, there is insufficient data available information on Orbis to determine their origin.

However, for a further 1,624 small French firms, or 27% more information could have been used such as their Global Ultimate Owner, shareholder, or historical shareholders to determine if these are domestic or foreign owned.

Therefore, this issue involved a trade-off: on the one hand, including these firms as domestic will underestimate foreign ownership, on the other hand removing these firms altogether would vastly *overestimate* foreign ownership, as due to the nature of small firms being from a data stream of dominantly sole traders these are less likely to be foreign owned.

Given this trade off, the companies were included as domestic as the former impact is likely to be smaller than the latter.

Table 67: Downloading restrictions for French firms

Status	Proportion
Sufficient information	
Domestically owned	61%
Indeterminate	12%
Insufficient information	
Domestically or Foreign owned	27%

CYPRIOT FIRMS

The names of firms based in Cyprus in the TED database are predominantly written in the Roman alphabet (accounting for 74%), however a sizeable minority (26%) of companies has its names written in the Greek alphabet.[87]

Attempts at matching the firms with both Latin and Greek alphabets have been undertaken. A very low (approximately 6.5%) match rate was achieved for contract awards with Greek names relative to a respectable 90% match rate for contract awards with Latin alphabet firms.

The Orbis server provides a far worse match rate as the algorithms used are not well suited to remedy the matching of Greek names. Moreover, further matching methods i.e. fuzzy matching could not be used due to issues of non-Latin character decoding in Stata 13.

The result is that most international foreign owned firms are likely to be matched at a far higher rate than domestically owned firms. Either it is assumed that Cypriot firms with names in the Greek alphabet are all domestically owned – and likely *understate* the proportion of foreign ownership – or it is assumed that Cypriot firms with names in the Greek alphabet are foreign owned with the same likelihood as Cypriot firms with names in the Latin alphabet. Both assumptions are likely to bias results.

GREEK FIRMS

87 When we solely consider the unique names, the Greek alphabet names account for 45% of companies.

The match rate of Greek firms is impacted by the same issue of matching the Cyrillic alphabet that is discussed for Cyprus in the paragraph above.

A further reason why the match rate Greek firms is poor is that the Orbis database contains only 136,476 active Greek firms in total (for a similar sized country this number is normally well above 2 million, e.g. Belgium has 2.4 million active firms in the database).

As a result, our match rate for contract awards in Greece is poor (28%) and is **prone to be biased towards the presence of firms in the Orbis database.**

NON-EU FIRMS WITH DOMESTIC OWNERS

Due to the split by EU28 countries, the ownership of non-EU28 companies is not analysed. This is possible, but would be time consuming and would have large data requirements.

The lack of owners for non-EU28 companies is likely to result in contracts awarded to companies based abroad with domestic owners, referred to as indirect domestic procurement being missed. An example is if a German public procurement is awarded to a US company, e.g. SIEMENS Energy Inc., with a Germany owner, SIEMENS AG.[88]

However, in practice this **presents only a minor concern given that levels of indirect domestic procurement are very low**. Therefore, although this causes some overestimation of direct foreign procurement, the magnitude of this effect is likely to be very small.

Table 68: Availability of indirect domestic procurement

Winner / Parent	Domestic owner	Foreign owner
Domestic company	Direct domestic procurement	Indirect foreign procurement
Foreign company	Indirect domestic procurement	Direct foreign procurement

Note: Indirect domestic procurement cannot be determined, through our methodology, if the winner is a non-EU28 company with domestic owner.

CONSORTIUM FIRMS

Of the 175,000 consortiums which were identified, 225,000 consortium members were not identified due to contact details only being available for the consortium leader.

As a result, contact details were allocated to the consortium leader and removed from the rest.

Implicitly, by leaving these consortium members out they are being allocated to the same country as the consortium member.

The downside of this is by allocating the same country as the consortium leader to the consortium members understates the diversity within a consortium. On the other hand, to attempt to match these names without a country would overstate the presence of foreign companies.

As a result, bias from only identifying the lead member of a consortium may be introduced depending on the degree to which there is diversity[89] within a consortium and the degree to which characteristics of the consortium leader differ from the consortium as a whole.

6.4.3. Evaluating potential sources of bias in GUOs

In addition to the bias due to incomplete and wrong matches, a bias might arise in the process of identifying firms as foreign or domestic.

88 TED does not list German public procurement to award a contract to SIEMENS Energy Inc. in 2009-2015.
89 In terms of country of firm owner location.

Firstly, the **assumption that firms are domestic on a 'best effort basis' is likely to understate the share of cross-border procurement**. This assumption is based on the expectation that firms with insufficient information to determine ownership on Orbis are most likely to be domestic under the assumption that foreign firms are more likely to have GUOs recorded. However, this assumption will not always hold.

Secondly, a more minor issue is that biases may arise due to incomplete chains of the corporate ownership. Corporate ownership refers to the chain of control of a firm, although non-controlling ownership (minority shareholding) is followed as well. As a result, through a failure to distinguish between majority and minority ownership, it is **possible that a company with foreign or domestic ownership has been incorrectly identified, this will lead to a bias (in the direction of the wrong identification) if domestic or foreign firms are more likely to incorrectly match.**

Note that this issue could have been avoided for the GUOs as Orbis provides a choice when downloading between using either a 25.01% or 50.01% ownership threshold.[90] Although applying the higher limit was considered to avoid this problem, it was not used as with a larger threshold there would have been a very large number of companies that would be neither foreign nor domestic owned.

Once the threshold is set, the impact of this choice on the matching cannot be assessed without re-downloading all GUOs which is not computationally feasible.

This decision reflects a trade-off between introducing bias if incorrectly identified firms were more likely to be foreign or domestic than in the sample and being able to distinguish between foreign and domestic firms. On balance, incorrect matches are unlikely to be leading to substantial bias and are more likely to be introducing imprecision in the results.

Specific issues

ISSUES OF MISSING BVD IDS

In 0.5% of cases, it was not possible to re-identify companies in Orbis using their Orbis firm name. Thus, although these firms were successfully matched it was not possible to identify whether they were domestic or foreign

For the fuzzy matching, the entire database of active EU firms (or with unknown status) from Orbis, or close to 50 million firms was downloaded.

After the first matching, fuzzy matched names from Orbis were then matched with an identical name from the full database to retrieve the BvD ID. This is as our credit allowance did not allow the BvD IDs downloads of all 50 million firms.

To download these BvD IDs, the Orbis upload search ("batch search") was used. While in theory the name from the database was known and the search should just be a question of searching from an identical name, no names were found in 1.4% of the cases. This **percentage reached over 4% of firms in Belgium and Luxembourg.**

Although it was not possible to identify an exact reason for this, by sampling the unmatched data and discussing the issue with the Orbis technical support staff, it appears that this was mainly due to firms undergoing a name change during the delay between downloading the firm name and re-uploading them to the Orbis query tool.

Indeed, many of these un-sampled firms were branches: this is due to the fact that branches are more likely than other entities to have name changes. Unfortunately, BvD does not track name changes to all firms. As a result, it is not possible to establish whether or not this explanation is sufficient.

90 Orbis only provides exact percentages for ownership under certain circumstances. Thus, once the ownership threshold is set it is not possible to assess the impact of considering minority ownership alongside majority.

Without BvD IDs, it is not possible to identify whether these are foreign or domestic companies. If the hypothesis of firm name changes is correct, then it is possible to conjecture that the unmatched firms are more likely to be larger firms. There is thus a possibility that the number of foreign procurement in Belgium, Luxembourg and Germany is underestimated.

6.4.4. Evaluating potential sources of bias in data processing

UNMATCHED FIRMS

In the data processing stage, any unmatched firms where the country of the contracting authority and country of the successful bidder were the same were applied the same relative percentages of domestic and indirect cross-border procurement as in the unit of interest.

This involved a trade-off between assuming all unmatched firms where the country of contracting authority was the same as the firm were domestic ("Option 1") or assuming that these firms had the same breakdown between indirect cross-border procurement and domestic procurement as the matched firms in the unit in question ("Option 2").

On the basis that Option 2 was the less restrictive assumption as it adjusted for the different match rates between countries it was chosen.

This decision had no impact on the level of direct cross-border procurement identified but would have impacted the share of indirect cross-border measured.

In order to illustrate the impact of this choice on the results, the shares of indirect cross-border procurement between the two options at the country level in the number of awards are presented below.[91]

It is important to note that the choice of option has a moderately large impact on the results: there is over 2 percentage points difference in the results in 11 out of 28 EU Member States. Unsurprisingly, the largest impact on results is in Greece - 11 percentage points - where there is a significantly lower match rate than in other Member States.

In turn, this result shows that although option 2 will overstate the share of indirect cross-border procurement, it is key to ensuring that differential match rates do not distort the results.

It should be noted that the true value of indirect procurement is likely to fall within the range of the two estimates presented.

Table 69: Comparing the impact of the different procedures for remaining unmatched values on results

Country	Option 1: Indirect cross-border share of the number of awards	Option 2: Indirect cross-border share of the number of awards	Difference between options (in p.p.)
Austria	16.6%	**19.0%**	2.5%
Belgium	28.9%	**32.1%**	3.2%
Bulgaria	11.0%	**11.4%**	0.4%
Croatia	2.9%	**3.8%**	0.9%
Cyprus	20.1%	**21.1%**	1.0%
Czech R.	14.3%	**15.5%**	1.2%
Denmark	20.8%	**22.8%**	2.0%
Estonia	20.1%	**22.0%**	1.9%

91 Direct cross-border shares are not presented below as they are unaffected by the option chosen.

Country	Option 1: Indirect cross-border share of the number of awards	Option 2: Indirect cross-border share of the number of awards	Difference between options (in p.p.)
Finland	29.2%	**30.9%**	1.7%
France	18.2%	**19.5%**	1.3%
Germany	16.1%	**17.6%**	1.5%
Greece	4.3%	**15.4%**	11.1%
Hungary	15.9%	**17.3%**	1.4%
Ireland	15.7%	**17.1%**	1.4%
Italy	18.1%	**21.3%**	3.3%
Latvia	26.8%	**31.7%**	4.9%
Lithuania	33.6%	**34.3%**	0.7%
Luxembourg	18.9%	**23.8%**	5.0%
Malta	25.5%	**28.8%**	3.3%
Netherlands	1.9%	**2.1%**	0.2%
Poland	17.2%	**18.3%**	1.1%
Portugal	21.0%	**23.7%**	2.7%
Romania	28.8%	**31.6%**	2.8%
Slovakia	34.2%	**34.8%**	0.6%
Slovenia	19.8%	**22.5%**	2.6%
Spain	14.9%	**15.3%**	0.3%
Sweden	18.0%	**19.3%**	1.3%
United Kingdom	18.8%	**20.0%**	1.2%

Source: London Economics based on TED transactions and Orbis database.

SIZE OF SUCCESSFUL BIDDER

In order to estimate the size of the successful bidder, we focused our analysis on a subset of firms for which we already held employment data.

This was mainly used due to the limitations of downloading further data on firm structure in Orbis.

This sample included all the firms recorded in Orbis in 2014 for which there was at least one observation for employment.

In turn, the main concern of applying this method is that by only considering firms for which employment data exists we may be overlooking a sub-set of SMEs.

In order to circumvent this issue, we selected two random samples, one of direct cross-border contracts and the other of indirect cross-border contracts, of around 1,000 firms each to upload to Orbis. For these firms, asset, turnover and employment data was downloaded under the logic that SMEs were likely to be firms where neither turnover nor employment data was available but asset data was. This is because in the majority of European countries SMEs may have to provide their assets and liabilities but not their turnover or employment.

In turn, the firms for which assets are available but turnover and employment is not likely to be SMEs.

Table 70: Test sample for determining the number of SMEs without employment data

Type of firm	Share in sample of direct cross-border contracts	Share in sample of indirect cross-border contracts
Firms where only asset data was available	15.5%	1.6%

In turn, having identified the number of firms which are likely to be SMEs, we re-weight our results by these percentages.

There is also a further subset of data for which no asset, turnover or employment data was available. These may be inactive firms or firms registered in countries where filling laws are lax. However, in all likelihood a substantial number of these will be SMEs.

Table 71: Test sample for the number of SMEs where no data is available

Type of firm	Share in sample of direct cross-border contracts	Share in sample of indirect cross-border contracts
Firms where no data is available	5.0%	0.4%

As we cannot ascertain how many of these firms are truly SMEs we do not re-weight our percentages. However, we present an alternative set of results in Table 72 which have been re-weighted by these percentages.

In reality, the true percentage of firms is likely to lie somewhere between the results presented in the report and the result presented below.

Table 72: Size of SME bidder, by weighting chosen

	Direct				Indirect			
	Share of number of awards (Main results)	Share of number of awards (Alternative results)	Share of value of awards (Main results)	Share of value of awards (Alternative results)	Share of number of awards (Main results)	Share of number of awards (Alternative results)	Share of value of awards (Main results)	Share of value of awards (Alternative results)
SME	**26.9%**	29.9%	**24.5%**	27.6%	**2.3%**	2.7%	**2.8%**	3.2%
Micro	**7.7%**	*8.6%*	**5.4%**	*6.0%*	**0.6%**	*1.3%*	**0.5%**	*1.2%*
Small	**11.5%**	*12.7%*	**10.2%**	*11.5%*	**1.1%**	*0.7%*	**1.0%**	*0.6%*
Medium	**7.8%**	*8.6%*	**8.9%**	*10.0%*	**0.6%**	*0.7%*	**1.2%**	*1.4%*
Large	**73.1%**	70.1%	**75.5%**	72.4%	**97.7%**	97.3%	**97.2%**	96.8%

Source: London Economics based on TED transactions and Orbis database.

6.5. Comparison of the methodology with the Ramboll Study (2011)

The 2011 Ramboll study analysed cross-border procurement using data on contract awards from TED between 2007 and 2009. Rather than attempt to match all contract awards over this period, the Ramboll study selected a disproportionately stratified sample.

This sample was subsequently matched with data from Dun & Bradstreet, D&B where foreign ownership was determined using global ultimate ownership information. In order to correct for

the bias in their sampling design, the data was then re-weighted using estimates for over and under sampling.

The key differences between this study and the Ramboll study is that while the Ramboll study focuses on matching a sample of TED contracts which is re-weighted, this study attempts to match all TED contracts and therefore does not re-weight the contracts matched. Moreover, while the Ramboll study uses the D&B database to identify the ownership structure of successful bidders, this study uses the Orbis database from Bureau Van Dijk.

In sum, the key differences between the two studies are:

- The sample of firms considered
- Method for determining foreign ownership
- Possible bias due to the database which is used to match the firms
- Weighting methods and corrections for bias

6.6. Orbis definitions

6.6.1. Definitions of foreign ownership

INDEPENDENCE INDICATOR

A

Orbis definition: Attached to any company with known recorded shareholders (excluding public and unnamed shareholders[92]) none of which having more than 25% of direct or total ownership.

This is further qualified as A+, A or A-:

A+: Companies with 6 or more identified shareholders whose ownership percentage is known

A: As above, but includes companies with 4 or 5 identified shareholders

A-: As above, but includes companies with 1 to 3 identified shareholders

B

Orbis definition: Attached to any company with a known recorded shareholder (excluding public and unnamed shareholders) none of which with an ownership percentage (direct, total or calculated total) over 50%, but having one or more shareholders with an ownership percentage above 25%.

The further qualification as B+, B and B- is assigned according to the same criteria relating to the number of recorded shareholders as for indicator A.

C

Orbis definition: Attached to any company with a recorded shareholder (excluding the 3 "collective" types mentioned above) with a total or a calculated total ownership over 50%.

The qualification C+ is attributed to C companies in which the summation of direct ownership percentage (all categories of shareholders included) is 50.01% or higher. Indeed, this means that the company surely does not qualify under Independent Indicator D (since it cannot have an unknown direct shareholder with 50.01% or higher).

92 Shareholders collectively labelled by the sources are disregarded since they are considered as unable to exert a controlling power over a company). They include: Public (used only for quoted companies), Unnamed private shareholders, aggregated (more than one unnamed individual or family, labelled as "Private shareholders", "Individual investors", "Other individuals", etc.), Other unnamed shareholders, aggregated (more than one unnamed shareholder containing a mixture of companies or of companies and individuals or families).

D

Orbis definition: This is allocated to any company with a recorded shareholder (excluding the 3 "collective" types) with a direct ownership of over 50%.

U

Orbis definition: This is allocated to companies that don't fall into the categories A, B, C or D - indicating an unknown degree of independence.

GUO (Ultimate Owner):

Definition: Path of minimum 25.01% of control, known or unknown shareholders, highest quoted company in the path (if any).

Criteria chosen on Orbis:

1. Minimum percentage for the path from a subject company to its Ultimate Owner (25.01%)
2. Consider a company to be the Ultimate Owner if it has no identified shareholder or if its shareholder's percentages are not known. (From Orbis: *"Entities with an Independence indicator U can be the UO of one of their subsidiaries.")* This enlarges the set of companies that can be an ultimate owner
3. The highest quoted company is considered the UO. From Orbis: "This means that a quoted company, even with an independence indicator D, can be the UO of its subsidiaries, as long as it is not itself owned by a quoted company with a path of minimum 25.01% or 50.01%. This alters the priority path, but not necessarily the set of companies to have an ultimate owner"

Total ownership (%): Percentage of control (as opposed to percentage of interest).[93]

Direct ownership (%): Direct Percentage of interest.

STANDARDISED LEGAL FORMS

- Sole trader/proprietorships
- Partnership
- Foreign companies
- Companies with unknown/unrecorded legal form.
- Private limited companies
- Public limited companies
- Non-profit organisations

HIGHEST CONTROLLING SHAREHOLDER

Orbis definition: The Controlling shareholders correspond to all shareholders that are present in the path between the subject company and its Ultimate Owner (according to the definition of the UO used). Please note that to identify CS we follow the path with the highest percentage (direct or total).

93 Total ownership may exceed 100%, namely indirect ownership and direct ownership can be double counted.

DEFINITIONS OF ACCOUNTS

In the Orbis database, a distinction is made between consolidated and unconsolidated accounts where a consolidated account is one in which the account statements integrate the controlled subsidiaries or branches and an unconsolidated account is one in which statements of controlled subsidiaries or branches are not included.

In turn, within these two categories there are four possible types of accounts which are distinguished across:

- C1: statement of a mother Company integrating the statements of its controlled subsidiaries or branches with no unconsolidated companion;
- C2: statement of a mother Company integrating the statements of its controlled subsidiaries or branches with an unconsolidated companion
- U1: statement not integrating the statements of the possible controlled subsidiaries or branches of the concerned Company with no consolidated companion
- U2: statement not integrating the statements of the possible controlled subsidiaries or branches of the concerned Company with a consolidated companion.

In turn, we can use the assumption that any firms with accounts that are either consolidated (C1 or C2) or have a consolidated companion (U2) are non-independent SMEs.

6.7. Additional analysis of direct and indirect cross-border procurement contracts

6.7.1. Relationship between cross-border shares and country size

Table 73: Direct and indirect cross-border shares between 2009 and 2015, GDP and Population across EU28

Country	GDP (2015)	Population (2015)	Total number of awards	Direct cross-border share of the number of awards	Indirect cross-border share of the number of awards	Total value (EUR million)	Direct cross-border share of value of awards	Indirect cross-border share of value of awards
Austria	337,286	8,576,261	22,488	6.1%	19.0%	15,172	5.2%	19.8%
Belgium	409,407	11,258,434	39,888	5.7%	32.1%	21,874	5.1%	36.1%
Bulgaria	44,162	7,202,198	61,887	0.7%	11.4%	14,219	4.5%	15.4%
Cyprus	17,421	847,008	6,502	6.4%	3.8%	2,503	13.8%	5.9%
Czech R.	163,948	10,538,275	56,866	2.5%	21.1%	31,665	3.0%	30.2%
Germany	3,025,900	81,197,537	219,566	1.6%	15.5%	77,711	2.1%	16.0%
Denmark	266,245	5,659,715	33,239	5.3%	22.8%	19,283	4.8%	16.7%
Estonia	20,461	1,313,271	13,358	5.8%	22.0%	8,282	7.4%	22.3%
Spain	1,081,190	46,449,565	99,745	1.5%	30.9%	74,804	1.2%	27.0%
Finland	207,220	5,471,753	31,918	3.0%	19.5%	17,507	2.9%	24.0%
France	2,181,064	66,415,161	821,626	1.3%	17.6%	184,360	1.8%	12.2%
Greece	176,023	10,858,018	27,648	1.2%	15.4%	12,233	3.4%	11.5%
Croatia	43,897	4,225,316	14,499	1.1%	17.3%	5,102	4.7%	17.4%
Hungary	108,748	9,855,571	40,793	1.9%	17.1%	24,071	3.6%	22.5%
Ireland	214,623	4,628,949	18,951	13.0%	21.3%	4,294	10.0%	20.8%
Italy	1,636,372	60,795,612	116,217	2.4%	31.7%	100,569	2.6%	24.2%
Lithuania	37,124	2,921,262	67,009	1.4%	34.3%	9,171	7.1%	20.9%

Country	GDP (2015)	Population (2015)	Total number of awards	Direct cross-border share of the number of awards	Indirect cross-border share of the number of awards	Total value (EUR million)	Direct cross-border share of value of awards	Indirect cross-border share of value of awards
Luxembourg	52,113	562,958	2,719	16.8%	23.8%	2,031	13.3%	18.7%
Latvia	24,378	1,986,096	70,616	2.3%	28.8%	32,874	3.2%	16.0%
Malta	8,806	429,344	1,775	11.9%	2.1%	1,030	19.6%	6.0%
Netherlands	678,572	16,900,726	43,508	2.6%	18.3%	17,837	2.8%	17.5%
Poland	427,737	38,005,614	789,644	0.9%	23.7%	132,644	1.9%	23.2%
Portugal	179,376	10,374,822	11,728	3.9%	31.6%	7,891	6.8%	25.9%
Romania	160,353	19,870,647	135,831	1.1%	34.8%	40,089	7.1%	24.0%
Sweden	444,617	9,747,355	58,241	2.4%	22.5%	11,967	3.4%	20.4%
Slovenia	38,543	2,062,874	44,984	1.8%	15.3%	8,368	7.8%	17.4%
Slovakia	78,071	5,421,349	19,571	4.3%	19.3%	16,313	6.4%	24.4%
UK	2,568,941	64,875,165	213,279	2.1%	20.0%	112,502	2.5%	22.3%

Source: London Economics based on TED transactions and Orbis database; GDP and population data from Eurostat.
Note: In the first and second columns, darker blue is assigned to larger GDP levels and population respectively. Darker green indicates high direct / indirect cross-border shares relative to other countries.
GDP is measured in current prices, EUR million.

6.7.2. Evolution of cross-border shares by type of contract

For service contracts, the direct cross-border share of the number of awards and share of value of awards has followed a generally increasing trend since 2009.

As to the indirect cross-border share, it followed a more variable trend over time: although the share in the number and value of awards was higher in 2015 than in 2009, the variability across years suggests that this may not reflect a meaningful trend.

Table 74: Direct and indirect cross-border procurement at the sector level breakdown by year between 2009 and 2015 for services contracts, EU28

Year	Total number of awards	Direct cross-border share of number of awards	Indirect cross-border share of number of awards	Total value of awards (EUR million)	Direct cross-border share of value of awards	Indirect cross-border share of value of awards
2009	135,113	1.1%	10.8%	54,391	1.7%	15.9%
2010	140,765	1.2%	12.0%	51,593	1.8%	18.0%
2011	154,483	1.1%	11.5%	57,489	1.9%	16.5%
2012	161,276	1.1%	11.0%	59,196	1.8%	15.4%
2013	154,809	1.6%	12.4%	55,455	1.9%	17.1%
2014	160,566	1.7%	11.7%	53,694	2.8%	18.4%
2015	161,511	1.6%	12.2%	61,480	2.4%	18.0%

Source: London Economics based on TED transactions and Orbis database.

A similar trend occurred in supply contracts with the share of direct cross-border generally increasing in terms of both number and value between 2009 and 2015, while the trend in indirect cross-border contracts was more varied.

Table 75: Direct and indirect cross-border procurement at the sector level breakdown by year between 2009 and 2015 for supply contracts, EU28

Year	Total number of awards	Direct cross-border share of number of awards	Indirect cross-border share of number of awards	Total value of awards (EUR million)	Direct cross-border share of value of awards	Indirect cross-border share of value of awards
2009	184,275	2.0%	28.8%	37,879	5.0%	32.5%
2010	217,803	1.9%	30.0%	39,036	4.6%	34.1%
2011	238,241	2.0%	30.2%	40,503	5.5%	32.7%
2012	252,093	1.8%	31.8%	41,402	5.0%	33.8%
2013	250,488	2.1%	30.4%	43,329	5.6%	32.4%
2014	271,362	2.1%	31.7%	47,729	5.2%	32.1%
2015	277,072	2.3%	30.6%	47,915	6.3%	31.9%

Source: London Economics based on TED transactions and Orbis database.

Finally, for works contracts the share of direct cross-border contracts remained stable between 2009 and 2012 but between 2012 and 2015 rose from 0.8% of all awards to 1.6% of all awards.

As to the share of indirect contracts, the trend is once more varied: the share of indirect contracts both in total number of awards and in value increased slightly between 2009 and 2015. However, over this period both measures have fluctuated displaying no clear trend.

Table 76: Direct and indirect cross-border procurement at the sector level breakdown by year between 2009 and 2015 for works contracts, EU28

Year	Total number of awards	Direct cross-border share of number of awards	Indirect cross-border share of number of awards	Total value of awards (EUR million)	Direct cross-border share of value of awards	Indirect cross-border share of value of awards
2009	40,973	0.8%	7.7%	46,657	1.4%	10.3%
2010	46,271	0.8%	8.1%	47,413	1.6%	13.5%
2011	49,519	0.7%	7.9%	50,013	1.5%	12.4%
2012	49,163	0.8%	7.8%	44,392	1.8%	12.7%
2013	47,823	1.4%	8.2%	46,741	2.6%	12.2%
2014	45,939	1.5%	7.9%	41,402	2.3%	13.3%
2015	44,551	1.6%	7.8%	38,658	1.8%	12.8%

Source: London Economics based on TED transactions and Orbis database.

6.7.3. *Comparing import penetration and cross-border procurement at the sector level*

Table 77: Indirect and direct cross-border shares in the total value of awards relative to estimated EU import penetration[94] between 2009 and 2015, EU28

Sector	Public sector import penetration	Total value of awards (EUR million)	Direct cross-border share of total value of awards	Indirect cross-border share of total value of awards
Agricultural, farming, fishing, forestry and related products & services	23%	19,953	0%	7%
Energy & water products, processing & provision	10%	47,891	1%	27%
Mining, basic metals and related products; Gases; Products and services related to the oil and gas industry	78%	9,261	6%	32%
Food, beverages, tobacco and related products	24%	13,193	1%	17%
Transport equipment and auxiliary products to transportation; Agricultural machinery	52%	35,571	9%	27%
Clothing, footwear, luggage articles and accessories (includes fabrics, plastic and rubber materials)	57%	4,939	8%	11%
Printed matter and related products	39%	4,239	10%	13%
Office and computing machinery, equipment and supplies (excl. furniture & software packages); Radio, television, communication, telecommunication and related equipment; and Laboratory, optical and precision equipments (excl. glasses)	69%	41,177	6%	29%
Electrical machinery, apparatus, equipment and consumables; lighting	57%	12,895	14%	28%
Medical equipments, pharmaceuticals and personal care products	74%	90,193	3%	49%
Security, fire-fighting, police and defence equipment	-	5,745	16%	17%
Furniture, furnishings, domestic appliances (excl. lighting) and cleaning products; Musical instruments, sport goods, games, toys, handicraft, art materials and accessories	60%	10,089	5%	14%
Industrial machinery and machinery for mining, quarrying & construction	71%	13,953	12%	21%
Construction work and Construction structures, materials and auxiliary products to construction (excl. electric apparatus)	5%	320,739	2%	13%
IT products & services	14%	45,993	4%	31%
Repair, maintenance & installation services (excludes software)	3%	42,666	3%	18%
Hotel, restaurant and retail trade services	4%	11,120	0%	23%
Transport services (excl. Waste transport)	10%	33,770	1%	11%

94 Based on the summation of the latest year of results for all EU28 countries which were found.

Sector	Public sector import penetration	Total value of awards (EUR million)	Direct cross-border share of total value of awards	Indirect cross-border share of total value of awards
Supporting and auxiliary transport services; travel agencies services	8%	4,972	4%	22%
Postal and telecommunications services	10%	8,806	1%	24%
Financial and insurance services	9%	27,975	3%	32%
Real estate services	4%	3,095	1%	13%
Architectural, construction, engineering and inspection services	12%	38,758	4%	14%
Research and development services and related consultancy services	3%	3,574	9%	20%
Administration, defence and social security services	0%	3,776	7%	13%
Business services: law, marketing, consulting, recruitment, printing and security	8%	30,225	2%	17%
Education and training services	0%	17,977	1%	6%
Health and social work services	0%	34,346	0%	11%
Sewage, refuse, cleaning and environmental services	11%	57,227	1%	13%
Recreational, cultural and sporting services	1%	3,690	4%	8%
Other community, social and personal services	1%	6,306	3%	13%

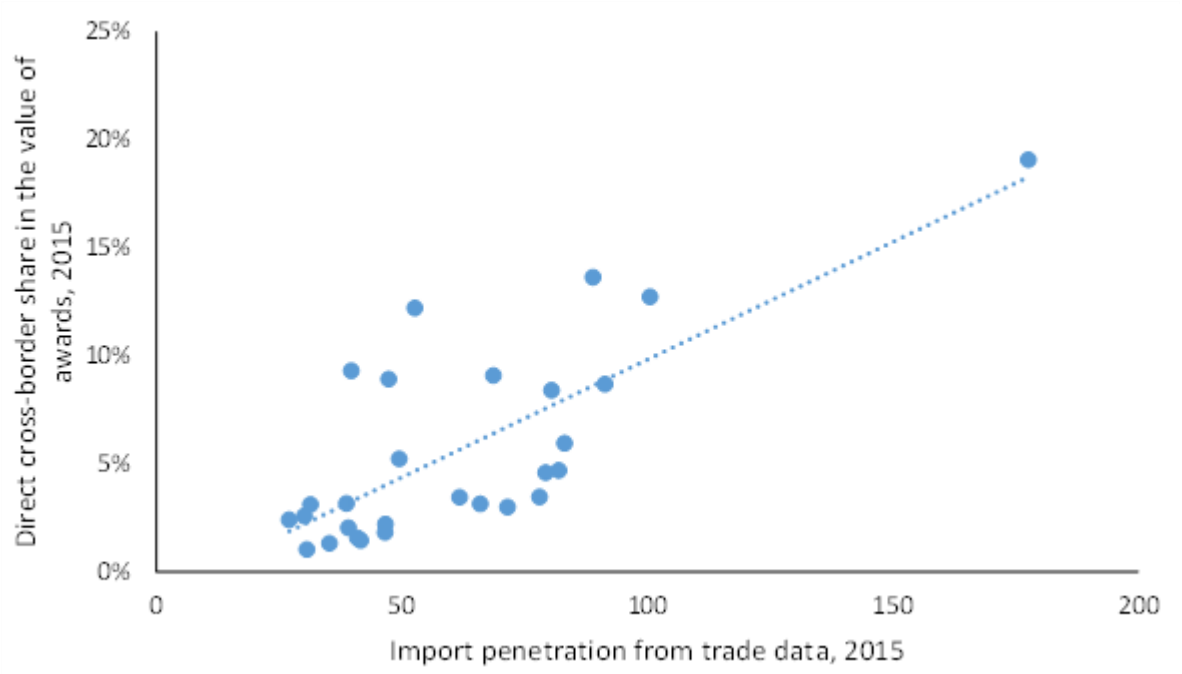
Source: London Economics based on TED transactions and Orbis database; Eurostat's supply, use and input-output tables.
Notes: EU level import penetration is estimated from latest available year of all countries for which data is available.

6.7.4. Relationship between cross-border shares and import penetration from trade data

Figure 47 and Figure 48 compare the direct and indirect cross-border procurement shares with the import penetration from trade data found in section 2.

For comparability, the shares of direct cross-border and indirect cross-border and import penetration are considered in 2015. As such, across all Member States, it can be observed that there is a relationship between direct cross-border procurement in the value of awards and import penetration from trade data.

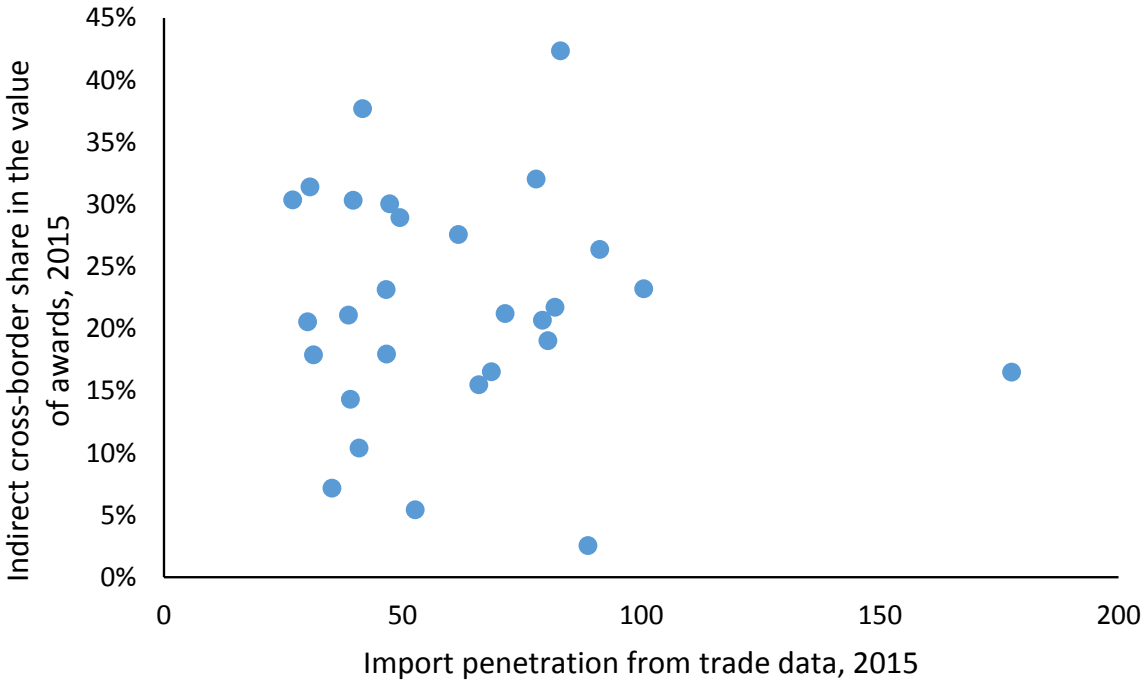
Figure 47: Relationship between the share of direct cross-border in total value of awards and import penetration, EU28



Source: London Economics based on TED transactions and Orbis database; World Bank, World Development Indicators: Structure of demand; http://data.worldbank.org/indicator/NE.IMP.GNFS.ZS
Note: Values for 2015 are either 2015 data or latest available for each country. Values for Luxembourg are excluded for readability but are originally from 121% to 177% over the period.

In contrast, there is, however, no observable relationship between the indirect cross-border procurement share in the value of awards and import penetration from trade data.

Figure 48: Relationship between the share of indirect cross-border in total value of awards and import penetration, EU28



Source: London Economics based on TED transactions and Orbis database; World Bank, World Development Indicators: Structure of demand; http://data.worldbank.org/indicator/NE.IMP.GNFS.ZS.
Note: Values for 2015 are either 2015 data or latest available for each country. Values for Luxembourg are excluded for readability but are originally from 121% to 177% over the period.

6.8. ComExt and Prodcom databases

6.8.1. Overview

Eurostat provides detailed production data on an 8-digit level provided which is referred to as the PRODCOM database.

It details EU production statistics for mining and quarrying, manufacturing, and electricity, gas and water supply that is sections C, D, and E of the Statistical Classification of Economic Activity in the European Union (NACE Rev. 2).

In addition to production quantities and value, Prodcom provides import and export information within the same classification:

- IMP_VALUE - the value of imports in Euro, derived from the External Trade statistics;
- EXP_VALUE - the value of exports in Euro, derived from the External Trade statistics.

Ideally, this could be used to calculate import penetration at a detailed sectoral level. However, the data for production and for external trade are not comparable. As a Eurostat note explains: "An estimation of consumption, known as apparent consumption, can be made by calculating production + imports - exports. However, the results are often unreliable (sometimes producing a negative figure) and this method cannot be recommended."

The implication is therefore that the calculation of the indicator of interest, which would be imports divided by production, would be equally unreliable.

In order to try to circumvent this problem, ComExt import data was used to derive import data which could be compared to production. This required constructing correspondences between different sector classifications.

Ultimately, the procedure was unsuccessful and the import penetration estimates highly unreliable. An illustration of this and further discussion is provided below.

6.8.2. *CPV conversion to match trade and production data and import penetration data*

In order to compare results from the TED database, ComExt and Input-Output tables at the sector level, a conversion between sector classifications had to be used.

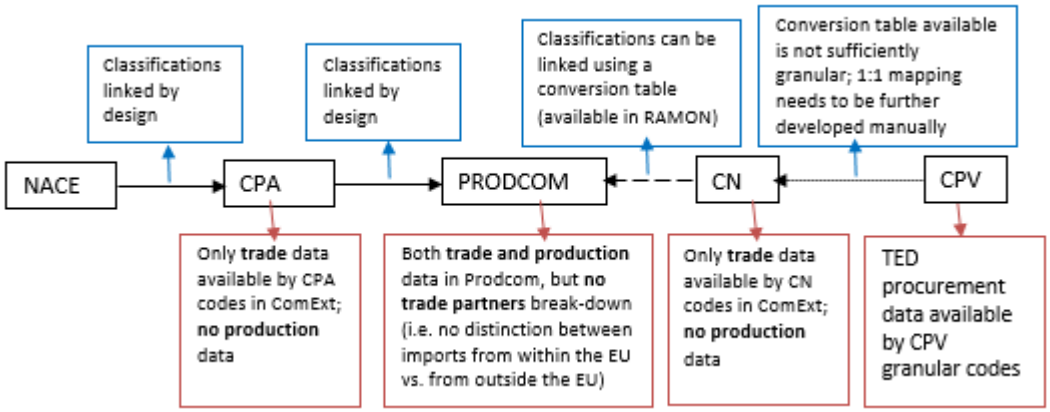
As the majority of the TED contract awards with a classification are classified under Common Procurement Vocabulary (CPV) codes, the aim was to convert ComExt and Input-Output tables to this classification.

As the only sector level breakdown of both trade and production data was available in the Prodcom classification, and Input-Output tables were only recorded in high level CPA classification, this required a conversion from the CPA and Prodcom[95] classifications to CPV.

Moreover, as import and production data from Prodcom was not comparable, import data from ComExt which was available in the CN classification also had to be converted to CPV.

As shown by Figure 49 below, the CPA and Prodcom classifications are linked by design so the challenge of linking these two classifications to CPV is, in theory, equivalent. In turn, the approach used was to first convert from CN to CPV and then convert from Prodcom/CPA to CPV.

Figure 49: Conversion steps between CPA, PRODCOM and CPV



Note: Solid arrow describes conversions with all sectors having a correspondence. Dotted arrow refers to incomplete conversion.

The first step involved converting from the Prodcom to CN classification using the correspondence table. This matching, however, did not cover all classification codes as not all the sectors in Prodcom are covered by the CN classification.

The second step was then to convert the remaining CN classification to CPV. This was done manually by matching granular CN sectors to high level CPV sectors.

The third step involved matching the Prodcom/CPA data to CPV. For this step, a different approach was pursued: instead of attempting to match the Prodcom classification at the granular sector level, the Prodcom classification was matched at the high level sector level. This was done by grouping high level CPA/Prodcom sectors. This conversion is given in Table 78 below.

The advantage of this approach is that by grouping sectors together, it is possible to limit the problem of granular Prodcom corresponding to many different CPV granular sectors. A further

95 Data in the Prodcom database is mostly recorded by product codes.

advantage is that it could be applied identically to both the Prodcom and input-output data[96] ensuring consistency in the conversion across both datasets.

Despite these advantages, the results for import penetration using the ComExt import data and the Prodcom production data were poor. Moreover, not all sectors could be converted. However, this issue is to some extent unavoidable as the CPV nomenclature covers a wider range of service sectors relative to the PRODCOM classification. There was also a large degree of subjectivity in this approach.

However, this approach could still be used to compare CPV and CPA data in section 3.15.

Table 78: Conversion used to convert high level PRODCOM sectors to CPV

2-digit PRODCOM/CPA CODE	CPV 2-digit code
01 + 02 + 03 + 16	03 + 77
01 + 02 + 03 + 16	03 + 77
01 + 02 + 03 + 16	03 + 77
01 + 02 + 03 + 16	03 + 77
05+06+07+08+09+20+23+24	14 + 24 + 76
05+06+07+08+09+20+23+24	14 + 24 + 76
05+06+07+08+09+20+23+24	14 + 24 + 76
05+06+07+08+09+20+23+24	14 + 24 + 76
05+06+07+08+09+20+23+24	14 + 24 + 76
05+06+07+08+09+20+23+24	14 + 24 + 76
05+06+07+08+09+20+23+24	14 + 24 + 76
05+06+07+08+09+20+23+24	14 + 24 + 76
12	15
15 + 22	18 + 19
15 + 22	18 + 19
17	22
18 + 58 + 69 + 70 + 73 + 74 + 80 + 81 + 82	79
18 + 58 + 69 + 70 + 73 + 74 + 80 + 81 + 82	79
18 + 58 + 69 + 70 + 73 + 74 + 80 + 81 + 82	79
18 + 58 + 69 + 70 + 73 + 74 + 80 + 81 + 82	79
18 + 58 + 69 + 70 + 73 + 74 + 80 + 81 + 82	79
18 + 58 + 69 + 70 + 73 + 74 + 80 + 81 + 82	79
18 + 58 + 69 + 70 + 73 + 74 + 80 + 81 + 82	79
18 + 58 + 69 + 70 + 73 + 74 + 80 + 81 + 82	79
18 + 58 + 69 + 70 + 73 + 74 + 80 + 81 + 82	79
19 + 35 + 36	09 + 41 + 65
19 + 35 + 36	09 + 41 + 65
19 + 35 + 36	09 + 41 + 65

96 Prodcom data was available at more granular level than sectors from IOT.

2-digit PRODCOM/CPA CODE	CPV 2-digit code
21	33
25 + 41 + 42 + 43	44 + 45
25 + 41 + 42 + 43	44 + 45
25 + 41 + 42 + 43	44 + 45
25 + 41 + 42 + 43	44 + 45
26	30 + 32 + 38
27	31
28	42 + 43
29+30	16 + 34
29+30	16 + 34
31/32	37 + 39
31/32	37 + 39
33 + 95	50 + 51
33 + 95	50 + 51
37/39	90
37/39	90
45 + 46	.
45 + 46	.
47 + 55 + 56	55
47 + 55 + 56	55
47 + 55 + 56	55
49 + 50 + 51	60
49 + 50 + 51	60
49 + 50 + 51	60
52 + 79	63
52 + 79	63
53 + 61	64
53 + 61	64
59/60	92
59/60	92
62/63	48 + 72
62/63	48 + 72
64 + 65 + 66	66
64 + 65 + 66	66
64 + 65 + 66	66
71	71
72	73
75	85
75 + 86 + 87 + 88	85

2-digit PRODCOM/CPA CODE	CPV 2-digit code
75 + 86 + 87 + 88	85
75 + 86 + 87 + 88	85
75 + 86 + 87 + 88	85
77 + 68	70
77 + 68	70
77 + 68	70
84	75
85	80
90 + 91 + 92 + 93	92
90 + 91 + 92 + 93	92
90 + 91 + 92 + 93	92
90 + 91 + 92 + 93	92
94 + 96	98
94 + 96	98

Note: Conversion did not cover all sectors.

6.8.3. Examples of import penetration for services and products, from ComExt and Prodcom data

Despite aggregating across sectors, the import penetration calculated from the ComExt and Prodcom import data were not reasonable. Moreover, data in any given year was typically available for only a small number of sectors and countries.

In order to illustrate this issue, the import penetration results for services and products are given below for 2013. The year 2013 was chosen as it is the most recent year with a higher number of sectors (relative to other years) available for both services and products.

The tables below only give import penetration results calculated using import data from Prodcom. However, the import penetration results calculated using the import data from ComExt was equally poor.

Any anomalous results have been highlighted in red.

Table 79: Import penetration of services for countries where data is available, 2013

Country	Business services: law, marketing, consulting, recruitment, printing and security	Construction work and Construction structures, materials and auxiliary products to construction (excl. electric apparatus)	Financial and insurance services	Recreational, cultural and sporting services	Postal and telecommunications services	Recreational, cultural and sporting services	Supporting and auxiliary transport services; travel agencies services	Transport services (excl. waste transport)
AT	38.51%	1.27%	13.34%	37.50%	14.75%	37.50%	393.69%	76.65%
BE	48.27%	3.37%	26.38%	23.65%	16.43%	23.65%	48.31%	80.72%
BG	30.16%	0.63%		9.66%	4.82%	9.66%		25.85%
HR	23.94%	0.00%	5.83%	18.37%	7.77%	18.37%		36.95%
CY	30.76%	0.74%		39.15%		39.15%	183.36%	483.71%
CZ	26.08%	1.48%		18.39%	11.35%	18.39%	62.39%	32.10%
DK	38.92%	1.24%		31.63%	9.93%	31.63%	60.18%	84.11%
EE	42.69%	8.96%		30.70%	23.53%	30.70%	29.64%	73.48%
FI	47.86%	3.82%					45.69%	33.24%
FR	17.30%	0.63%		14.60%	7.32%	14.60%	42.15%	34.36%
DE	26.20%	3.07%	11.38%	7.25%	11.05%	7.25%	55.48%	44.60%
EL	12.06%	1.85%		22.56%	9.65%	22.56%		
HU	59.11%	2.45%	19.51%	26.02%	9.21%	26.02%	391.88%	54.10%
IE								
IT	14.34%	0.05%		2.62%	7.58%	2.62%	38.28%	18.76%
LV	27.94%	1.59%	49.44%	20.81%	10.80%	20.81%	37.75%	61.70%
LT	20.55%	1.86%	34.32%	19.98%	13.48%	19.98%	41.44%	70.71%
LU	632.36%	6.11%			31.52%			
MT	62.99%		456.75%					192.19%
NL	28.49%	2.73%		14.67%	17.67%	14.67%	43.21%	44.15%
PL	23.36%	1.24%		12.20%	4.53%	12.20%	78.58%	22.20%
PT	14.21%	0.70%	15.10%	36.80%	6.39%	36.80%	150.91%	42.11%
RO	34.06%	1.13%	0.01%	5.15%	7.46%	5.15%	34.05%	19.01%
SK	15.45%	6.48%	14.16%	42.77%	3.66%	42.77%	59.92%	36.63%
SI	33.69%	6.19%		21.75%	20.20%	21.75%	148.89%	34.98%
ES	39.95%	1.13%		27.11%	7.59%	27.11%		36.99%
SE	37.88%	2.48%		6.29%	12.83%	6.29%	48.26%	26.67%
UK	10.86%	0.99%	14.22%	1.81%	6.66%	1.81%	34.50%	25.68%

Source: London Economics based on ComExt
Note: Red cells refer to sectors where import penetration is above 80%.

Table 80: Import penetration of products for countries where data is available, 2013

Country	Agricultural, farming, fishing, forestry and related products & services	Business services: law, marketing, consulting, recruitment, printing and security	Clothing, footwear, luggage articles and accessories (includes fabrics, plastic and rubber materials)	Construction work and Construction structures, materials and auxiliary products to construction (excl. electric apparatus)	Electrical machinery, apparatus, equipment and consumables; Lighting	Food products, beverages and tobacco products	Furniture, furnishings, domestic appliances (excl. lighting) and cleaning products; Musical instruments, sport goods, games, toys, handicraft, art materials and accessories	Industrial machinery and machinery for mining, quarrying & construction	Medical equipments, pharmaceuticals and personal care products	Mining, basic metals and related products; Gases; Products and services related to the oil and gas industry	Office and computing machinery, equipment and supplies; Radio, television, communication, telecommunication and related equipment; and Laboratory, optical and precision equipments	Printed matter and related products	Sewage-, refuse-, cleaning-, and environmental services	Transport equipment and auxiliary products to transportation; Agricultural machinery
AT	34.0%	64.1%	102.6%	60.4%	100.5%	44.2%	109.7%	77.8%	234.5%	47.2%	138.5%	48.5%		107.3%
BE	57.3%		122.2%	58.0%	109.2%	66.7%	349.0%	125.3%	1597.1%	109.5%	184.5%	58.0%		122.3%
BG	27.4%	64.9%	70.3%	54.8%	101.2%	30.0%	48.3%	90.4%	153.7%	68.1%	119.6%	29.3%	28.5%	48.7%
HR	49.2%	65.0%	83.7%	65.0%	78.9%	30.8%	67.1%	86.2%	87.6%	62.9%	106.1%	41.3%	29.9%	117.0%
DK	53.5%	48.6%	127.9%	53.2%	110.4%	48.6%	97.3%	96.4%	73.7%	85.1%	121.9%	65.6%	61.2%	124.0%
EE	40.5%	103.0%	93.5%	55.7%	95.6%	55.2%	65.3%	102.4%	103.3%	52.6%	64.3%	70.1%	256.2%	145.7%
FI	20.8%	80.2%	79.7%	40.0%	72.0%	26.8%	61.6%	53.7%	85.4%	45.7%	112.4%	20.2%	36.1%	94.2%
FR	33.4%	98.7%	78.1%	42.8%	82.2%	24.7%	97.2%	85.2%	113.1%	49.8%	98.2%	40.4%		83.8%
DE	31.4%	32.3%	91.5%	47.6%	88.6%	29.8%	79.6%	60.5%	55.7%	65.5%	129.4%	32.3%	84.2%	64.3%
EL	57.1%		83.2%	41.0%	59.1%	37.0%	70.6%	75.7%	104.8%	46.9%	107.2%	34.2%		101.6%
HU	78.5%	65.3%	95.5%	87.3%	141.4%	27.7%	64.8%	97.5%	209.3%	66.4%	115.6%	37.3%	9.7%	71.3%
IE	24.7%	26.5%	71.9%	35.2%	44.8%	32.6%	26.8%	81.1%	25.0%	35.8%	32.3%	47.9%		69.5%
IT	27.6%	42.5%	59.2%	19.2%	58.8%	28.5%	36.8%	47.3%	129.9%	45.4%	90.5%	14.8%	11.2%	53.9%
LV	18.2%		115.2%	37.2%	69.4%	43.3%	72.5%	137.7%		40.4%	50.7%	42.2%	7.3%	128.0%
LT	56.0%		93.1%	117.1%	167.9%	55.8%	51.6%	163.2%	166.9%	95.5%	190.5%	57.6%	13.7%	121.1%
NL	49.0%	85.6%	100.3%	37.9%	162.7%	50.5%	176.2%	133.0%	1272.1%	65.8%	363.0%	40.0%		98.9%
PL	22.5%	96.3%	76.8%	54.5%	92.6%	18.7%	69.9%	103.8%	88.9%	48.3%	108.4%	38.6%	13.3%	65.4%
PT	26.6%	32.0%	64.0%	42.2%	71.1%	37.5%	75.5%	81.4%	101.7%	57.3%	67.7%	26.7%	10.0%	74.6%
RO	18.7%	221.4%	58.6%	71.1%	106.8%	22.2%	58.7%	68.6%	115.4%	38.9%	79.3%	38.0%	17.8%	50.2%
SK	54.9%		100.8%	75.0%	114.0%	52.1%	101.5%	103.0%	124.5%	62.4%	95.2%	64.8%		70.3%

Country	Agricultural, farming, fishing, forestry and related products & services	Business services: law, marketing, consulting, recruitment, printing and security	Clothing, footwear, luggage articles and accessories (includes fabrics, plastic and rubber materials)	Construction work and Construction structures, materials and auxiliary products to construction (excl. electric apparatus)	Electrical machinery, apparatus, equipment and consumables; Lighting	Food products, beverages and tobacco products	Furniture, furnishings, domestic appliances (excl. lighting) and cleaning products; Musical instruments, sport goods, games, toys, handicraft, art materials and accessories	Industrial machinery and machinery for mining, quarrying & construction	Medical equipments, pharmaceuticals and personal care products	Mining, basic metals and related products; Gases; Products and services related to the oil and gas industry	Office and computing machinery, equipment and supplies; Radio, television, communication, telecommunication and related equipment; and Laboratory, optical and precision equipments	Printed matter and related products	Sewage-, refuse-, cleaning-, and environmental services	Transport equipment and auxiliary products to transportation; Agricultural machinery
SI	65.0%	67.7%	69.9%	95.4%	90.6%	35.7%	99.9%	116.4%		68.7%	102.3%	30.1%		37.6%
ES	31.7%	19.3%	100.8%	43.4%	89.1%	22.3%	76.8%	80.7%	108.3%	49.5%	102.8%	26.2%	11.3%	79.7%
SE	12.9%		68.4%	46.1%	103.0%	36.3%	99.6%	78.1%	92.8%	46.5%	192.3%	23.5%	73.8%	51.2%
UK	32.8%		28.8%	47.6%	85.2%		79.4%	97.7%	183.9%			37.6%	30.5%	

Source: London Economics based on ComExt.
Note: Red cells refer to sectors where import penetration is above 80%, No data available for Cyprus, Malta, Luxembourg and Czech Republic.

6.9. Final survey

About your company

1) How many employees work in your company? *

**compulsory question*

- 1 - 9 employees
- 10 - 49 employees
- 50 – 249 employees
- 250 and more employees
- Do not know

2) Which sector does your company operate in? *

**compulsory question*

- Agriculture
- Mining and quarrying
- Manufacturing
- Gas & electricity supply
- Water & waste management
- Construction
- Transportation & storage
- Wholesale, retail & leisure
- Information technology & communications
- Finance & insurance
- Real estate
- Professional and support services (legal, accounting, science & engineering)
- Do not know
- Other - Write in:

3) Is your company a subsidiary/foreign affiliate i.e. it is owned by another company located abroad?

- Yes
- No
- Do not know

4) How many subsidiaries/affiliates has your parent company established abroad?

- 0
- 1-5
- 6-10
- >10
- Do not know

% turnover generated by public procurement

5) Approximately what share of your company's turnover comes from public procurement (domestic and cross-border)?

- < 10%
- 10 – 25%
- 26 – 50%
- > 50%
- Do not know

6) Approximately what share of your turnover comes from cross-border public procurement? *

**compulsory question*

- < 10%
- 10 – 25%
- 26 – 50%
- > 50%
- Do not know

Experience with public procurement

7) How often has your company participated in public procurement tenders (domestically and abroad) in the last three years?

- 1 to 5
- 6 to 10
- 11 to 20
- More than 20

- Do not know

8) What was your company's average success rate in public procurement tenders (domestically and abroad) in the last three years?

- < 10 %
- 10 – 25 %
- 26 – 50%
- > 50%
- Do not know

Experience with cross-border public procurement

9) How often has your company participated in cross-border public procurement tenders in the last three years (either on its own or in cooperation with other companies, including companies from abroad)?

- 0
- 1 to 5
- 6 to 10
- 11 to 20
- More than 20
- Do not know

10) What was your company's average success rate when participating in cross-border public procurement tenders in the last three years (either on its own or in cooperation with other companies, including companies from abroad)?

- Never won
- < 10 %
- 10 – 25 %
- 26 – 50 %
- > 51 %
- Do not know

Success Factors

11) Based on your experience, what are the most effective/successful ways in bidding for cross-border public procurement tenders?

	Not effective	Less effective	Medium effective	Highly effective

Bidding directly abroad	○	○	○	○
Including local foreign subcontractor(s) when bidding abroad	○	○	○	○
Including local foreign consortium partner(s) when bidding abroad	○	○	○	○
Bidding abroad as a foreign sub-contractor for a lead contractor	○	○	○	○
Bidding abroad as a consortium partner for a foreign consortium lead	○	○	○	○
Bidding through a subsidiary/affiliate located abroad (in the country of the tender)	○	○	○	○
Selling through local wholesalers	○	○	○	○
Do not know	○	○	○	○

Factors hampering participation in cross-border public procurement

12) In your opinion, is access to information regarding <u>cross-border public procurement</u> tenders a barrier for your company to participate in these cross-border tenders?

○ Yes

○ No

○ Do not know

13) Which information sources do you use to identify <u>cross-border public procurement</u> tendering opportunities?

	Never	**Sometimes**	**Often**	**Always**
The Official Journal/Tenders Electronic Daily website	○	○	○	○
National/regional/local public procurement portals	○	○	○	○
Contracting authorities' websites	○	○	○	○
Contact points of European Enterprise Network (EEN)	○	○	○	○
Specialized e-portals where public sector buyers use to publish contract opportunities (including paid service)	○	○	○	○
Referrals from business partners/ Information form organisations/associations your company is member of	○	○	○	○
Newspapers, specialized magazines, publications	○	○	○	○
Do not know	○	○	○	○

Non-participation in cross-border public procurement

14) To what extent do the following factors create barriers to <u>cross-border public procurement</u>?

	Not relevant	**Low relevance**	**Medium relevance**	**High relevance**
Language barriers	○	○	○	○
Perceived preference among contracting authorities for local bidders	○	○	○	○

Lack of experience with doing business abroad in general	○	○	○	○
High competition from national bidders	○	○	○	○
Risks imposed by possible currency exchange rate fluctuations	○	○	○	○
Additional costs due to geographic distance, i.e. implementation of contract is more expensive compared to delivery of contract close to own location	○	○	○	○
Different types of technical specifications are demanded comparing to experience in own country (e.g. different IT standards)	○	○	○	○
Unfamiliar legal context or formal requirements (e.g. contract, labour law, certificates to provide such as special permits necessary for offering services abroad etc.) leading to market entry barriers in the awarding country	○	○	○	○
Tax or social insurance differences leading to cost disadvantages	○	○	○	○
Do not know	○	○	○	○

15) In your opinion, is bidding for <u>cross-border public procurement</u> tenders more expensive than bidding domestically?

○ Yes

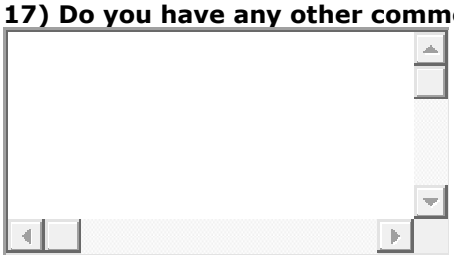
○ No

○ Do not know

16) To what extent is bidding for cross-border public procurement tenders more expensive than bidding domestically?

- <10%
- 10-20%
- 21-30%
- >31%
- Do not know

17) Do you have any other comments you would like to share with us?



6.10. Our approach to the Case Studies

Each case study included desk research and a set of interviews with contracting authorities and individual companies for a total of 47 case study interviews. The 10 case study countries were drawn from the 28 Member States covered by the study and are based on interesting cross-border procurement patterns identified in Task 1 and 2.

The case studies were selected on the basis of the extent of cross-border procurement in the country and approved by the Commission during the interim report meeting:

- Contracting authority AT – Country of contract award winner DE
- Contracting authority BE – Country of contract award winner NL
- Contracting authority DK – Country of contract award winner SE
- Contracting authority EE – Country of contract award winner DE
- Contracting authority ES – Country of contract award winner NL
- Contracting authority IE – Country of contract award winner UK
- Contracting authority IT – Country of contract award winner FR
- Contracting authority PL – Country of contract award winner UK
- Contracting authority RO – Country of contract award winner IT
- Contracting authority SK – Country of contract award winner CZ

We tried to cover different types of contracting authorities, types of contracts and procurement channels, however this largely depended on the responses we received from the contacted stakeholders and their willingness to participate in the interviews.

Desk review
Based on the publically available documents, we reviewed the public procurement regime in place in each case study country and within the specific authority to be covered. The objective was not to describe the national system in its entirety but to focus on the key objectives of this study and in particular the objectives of the case studies in highlighting practical examples, good practices and suggestions for improvement.

Interviewee selection
For each case study, we aimed to undertake 3 interviews including public officials (i.e. in the contracting authority under study) and the company having worked with the authority under study. We approached companies and contracting authorities using the contact details contained in the TED Database. Indeed, for both categories the following information were available:

- For the *Contract award winners*: "name", "e-mail", "town", "postal code", "phone", "fax", "address";

- For the *Contracting authority*: "*name*", "*type*", "*main activity*", "*contact point*", "*e-mail*", "*town*", "*postal code*", "*phone*", "*fax*", "*address*";

In order to achieve a good response rate, we proposed to guarantee full anonymity to the interviewed business, personal details were not asked and we respected the EU data protection rules when conducting the interview.

The target persons for the interviews was the person in charge of business development for the company, one public official in charge of public procurement and one official in charge of managing the content/delivery of cross-border procurement contract. This combination gave us a good overview of both demand and supply side considerations for the examples selected for the case study.

Topic guides
All interviews were semi-structured in nature and our topics guides considered four themes:

Table 81: Non-exhaustive interview questions

Type of interviewee	Questions
Companies	**Description of the practical experience with cross-border procurement:** • What type of work/service was supplied as part of the cross-border contract? • What was the value of the cross-border public procurement contract? • How long was the contract for? • Which type of award procedure was used? • How did your company find out about this tender opportunity? Was this information written in your language, language you or your staff know? If not, how did you overcome the language barrier? • Was it a one-off experience or is cross-border public procurement part of your company business model? What proportion of the yearly turnover represents cross-border public procurement? **Drivers of cross-border public procurement:** • Why did your company choose to bid for the public procurement abroad? • Do you think that bidding for a foreign public procurement is a good diversification practice? And why? • Does foreign public procurement provide a stable source of income in comparison to the public procurement in your home country (national, regional or local)? • Based on your knowledge and experience, does foreign public procurement offer more work opportunities than in your home country? **Advantages/disadvantage in a cross-border public procurement:** • What was the added value of bidding cross-border for your company? • How long did your company need to wait for the award notice? • Based on your experience, does it take longer than in your home country (national, regional or local)? • What were the payment terms specified in the contract? Were they longer than in your home country (national, regional or local)? Were the payments made on time? • Based on your knowledge and experience, have you or your staff had any issues linked to language barrier, differences in culture etc.? If so, what were they and how did you overcome these? • What is so problematic with cross-border bidding? **Good practices and suggestions for improvement to facilitate the use of cross-border procurement in future:** • Based on your knowledge and experience, was the tender information more difficult to retrieve? Were the tender documents provided in your native language? • Based on your knowledge and experience, was the tender evaluated fairly and objectively in all evaluation criteria? • Based on your knowledge and experience, how important was the price according to the evaluation criteria? • What was your biding strategy for this contract (i.e. type of partners, pricing, networks, information source, language etc.) and in your opinion why was it successful? • Is direct bidding a market entry strategy? Is it then replaced by indirect cross-border (if successful)? • Have you had any additional admin burden in comparison to bidding domestically? And if you have, how did you minimise it? • What can be done to facilitate access? • What authorities/EU could do to help cross-border public procurement?
Public authorities	**Description of the practical experience with cross-border procurement:** • What type of work/service was supplied as part of the cross-border contract? • What was the value of the cross-border public procurement contract?

Type of interviewee	Questions
	• How long was the contract for? • Which type of award procedure was used? • Were the tender documents provided in any other EU language? • What channels were used to disseminate information about the tender in question? • Based on your knowledge, how often foreign contracts are awarded within your organisation? **Drivers of cross-border procurement:** • What were the main factors determining opening of the European wide public procurement procedures? • What were the main considerations in awarding the public procurement? How important was the price factor? • When assessing/awarding contracts, how important is involvement of local partners or subcontractors? • How important is the number of bidders? • Does the number of bidders, including foreign contractors, affect the price and/or quality of offered services? **Advantages/disadvantage in a cross-border contract:** • Are public procurement markets contestable in your view? • Is it a big deal that there is no cross-border public procurement if markets are contestable? • Do you believe that there are border effects despite the Internal Market? If so, in what way? • Based on your knowledge, does the presence of foreign bidders significantly increase the evaluation costs? • How many days were necessary in order to evaluate and to award the contract? • In your opinion, does the presence of foreign bidders complicate the evaluation process? • Have you experiences any issue with foreign contractors due to language barrier, differences in cultures etc.? • What were the benefits of tendering/awarding contacts cross-border (i.e. better value for money, quality, number of offers/ competition, innovative solution)? **Good practices and suggestions for improvement to facilitate the use of cross-border procurement in future:** • Were the bidders offered an opportunity to ask (clarification) questions about prior to the submission deadline? • Had information been provided to unsuccessful tenderers, including foreign bidders? If so, in which language were these letters written? • Based on your knowledge and experience, which form (type of procedure) of contracting encourages more foreign bidders to apply? Why? • Based on your knowledge and experience, does the splitting contract in lots encourage foreign bidders? • Based on your experience, what is the best way of encouraging companies to bid cross-border? • What can be done to facilitate access? What authorities/EU could do to help cross-border public procurement?