Impact of the EU-Ukraine Free Trade Agreement on the Dutch Economy

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Executive Summary

We predict the impact of the EU-Ukraine DCFTA on the Dutch economy using an international trade model. We find that, in the long run, the DCFTA could nearly triple Dutch exports to Ukraine and nearly double Dutch imports from Ukraine. These effects are not yet clearly visible in recent trade statistics. The predicted impact on the overall Dutch economy is positive, but small in size.

Despite the fact that it has not yet been fully ratified, a Deep and Comprehensive Free Trade Agreement (DCFTA) between the EU and Ukraine has been provisionally applied since 1 January 2016. This report aims to assess the impact of this DCFTA on the Dutch economy. It provides an analysis of recent trade flows between Ukraine and the Netherlands and uses an international trade model to predict the long-term impact on Dutch trade and real GDP.

Dutch exports of goods to Ukraine declined significantly between 2012-2015, but increased by 18% during the first 11 months of 2016. While this recovery in exports coincides with the first year during which the DCFTA was provisionally applied, it is difficult to determine to what extent there is a causal effect. To some extent, the growth of Dutch exports during 2016 was likely a recovery from the earlier drop that occurred during the armed conflict in eastern Ukraine during 2014 and 2015. The recovery of Dutch exports to Ukraine appears to have been mostly driven by food, machinery and transport equipment, and manufactured goods categories.

Similarly, it is too early to assess whether the DCFTA has already had any impact on Dutch imports from Ukraine, which consist largely of maize, sunflower seeds, and sunflower oil. First, the period that has passed is simply too short. Second, there are inconsistencies in the official import data, as sectoral import data do not add up to total import data for some years. Third, the import data are affected to a large extent by a major increase and more recent decline in Dutch food imports from Ukraine, which appear to be unrelated to the DCFTA.

To estimate the impact that the DCFTA will eventually have on the Dutch economy, it is more reliable to make long-run predictions using a rigorous economic model, rather than looking at recent trade statistics. We do this by employing a 'gravity model' of international trade that incorporates both the direct effects (*trade creation*) and the indirect effects (*trade diversion*) of the DCFTA. We use the model to predict the impact on bilateral trade between the Netherlands and Ukraine, as well as the impact on total Dutch trade and GDP.

The model predicts that the DCFTA will have a positive long-term impact on bilateral trade between the Netherlands and Ukraine. We estimate that Dutch exports to Ukraine will nearly triple, from €1.5 billion to roughly €4.2 billion. Dutch imports from Ukraine are predicted to nearly double, from €0.7 to €1.3 billion.

The overall impact on the Dutch economy is also positive, but small. Taking into account all direct and indirect effects on bilateral trade and trade with third countries, Dutch real GDP would increase by €177 million as a result of the DCFTA. This is equivalent to a growth rate of 0.03% with respect to the 2015 GDP level.

These predicted results require a cautious interpretation. First, the estimated coefficients are long-run predicted effects that would occur under stable economic conditions and that require the assumption that everything else remains equal. This may not necessarily hold for the EU-Ukraine trade relation. Second, we have not taken into account the legal enforceability of the provisions in the FTA. Third, the exact magnitude of the estimated effect is hard to pinpoint precisely., as this is a statistical model which always implies some uncertainty. Our robustness checks suggest that different model specifications yield results that are quantitatively slightly different, but qualitatively similar. Finally, this study is limited to the impact on trade and GDP and does not address any other possible positive or negative effects that the DCFTA may have.

Table of Contents

1 Introduction

Since 1 January 2016, a Deep and Comprehensive Free Trade Agreement (DCFTA) between the EU and Ukraine has been provisionally applied, despite delays in ratification by the Netherlands. This report aims to assess the impact of this DCFTA on the Dutch economy, limiting itself to predicting the long-term impact on Dutch trade and GDP.

This report aims to estimate the economic effects on the Dutch economy of the Deep and Comprehensive Free Trade Agreement (DCFTA) between the European Union (EU) and Ukraine. This DCFTA has been provisionally applied since January 2016, as part of the EU Association Agreement with Ukraine.

The EU and Ukraine started negotiations on an Association Agreement (AA) in March 2007. A core element of this Agreement is the Deep and Comprehensive Free Trade Agreement (DCFTA), on which negotiations started in February 2008. The AA was signed by Ukraine and the EU in June 2014 (Emerson & Movchan, 2016). The Ukrainian and European Parliaments ratified the Agreement in September 2014. All European member states except the Netherlands had ratified the agreement by early 2016 (Emerson & Movchan, 2016).

Despite the fact that it has not yet been fully ratified by all EU member states, the Agreement and the DCFTA are already provisionally applied from 1 January 2016. The application was done to avoid the long process of waiting for full ratification, which often can take more than 3 years (Van der Loo 2016). The remainder of this study will take the application as given and assesses the implications of the DCFTA under the assumption that it has been effective from 1 January 2016 onwards.

This report provides some background to the DCFTA, analyses recent economic developments in Ukraine, reports the most recent statistics on Dutch-Ukrainian trade flows, and uses a global trade model to predict the long-run impact of the DCFTA on trade and GDP. The empirical analysis limits itself to predicting the implications of these changes for trade between the Netherlands and Ukraine, total Dutch trade and Dutch real GDP. The report does not take into account the impact on other economic or political issues.

The report is organised as follows. Chapter 2 provides some background on the EU Association Agreement, on the Ukrainian economy, and on recent trade flows between the Netherlands and Ukraine. Chapter 3 presents our estimation methodology and results. Chapter 4 summarizes the conclusions.

2 Background to the DCFTA

In June 2014, Ukraine and the EU signed an Association Agreement, which includes a Deep and Comprehensive Trade Agreement. The trade agreement includes the elimination of 98% of trade duties and the harmonisation of custom services. Previous studies on the impact of the DCFTA have predicted positive but small effects on the EU.

2.1 Background to the Association Agreement

The EU-Ukraine Association Agreement (AA) is the first of a new generation of Association Agreements with Eastern Partnership countries (European External Action Service, 2017). Negotiations were launched in March 2007. In February 2008, following confirmation of Ukraine's WTO membership, the EU and Ukraine launched negotiations on a Deep and Comprehensive Free Trade Agreement (DCFTA) as a core element of the Association Agreement.

At the 15th Ukraine-EU Summit of 19 December 2011, EU leaders and President Yanukovych noted that a common understanding on the text of the Association Agreement was reached, and on 30 March 2012 both parties initialed the text of the Association Agreement, which included provisions on the establishment of a DCFTA as an integral part. In this context, chief trade negotiators from both sides initialed the DCFTA part of the Agreement on 19 July 2012. (European External Action Service, 2017)

On 10 December 2012, the Council of the European Union adopted Conclusions on Ukraine that affirmed the EU's commitment to signing the AA as soon as Ukraine had taken determined action and made tangible progress towards achieving the benchmarks set out in the Conclusions.

The political provisions of the AA were signed in March 2014, and the AA itself was signed in Brussels by European Union Heads of State and Government and Ukrainian President Poroshenko on 27 June 2014. The AA was simultaneously ratified by the Ukrainian Parliament and the European Parliament on 16 September 2014.

The broad Association Agreement between the EU and Ukraine consists of three important elements:[1]

- **Stimulating core reforms aimed at economic recovery and growth.** These include industrial and sectoral cooperation between the EU and Ukraine in e.g. energy, transport, and environmental protection, as well as reforms related to social development, equal rights, consumer protection, education, youth and cultural cooperation.
- **A strong emphasis on values and principles**, in areas including justice and safety, rule of law, democracy, human rights, and good governance.
- **Strengthening economic and trade relations through a DCFTA**. This implies not only the phasing out of import and export tariffs, but also addressing competitiveness issues and helping Ukraine to meet EU legislation, norms and standards for trading on EU markets.

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[1] Taken from European External Action Service (2017); European Union Advisory Mission Ukraine (2017).

2.2   Key Aspects of the DCFTA

Emerson & Movchan (2016) provide an accessible overview of the contents of the Association Agreement and the DCFTA. Based on this overview, we can describe the key aspects of the DCFTA as follows:[2]

1. **The DCFTA almost completely liberalises trade between Ukraine and the EU, eliminating in excess of 98% of trade duties by trade volume.** This liberalisation applies to a wide range of sectors, including industrial products, raw materials, and agriculture. Furthermore, the DCFTA is set to reduce Ukrainian export duties and harmonise rules of origin. The DCFTA also includes rules on trade defense measures both treaty partners may or may not employ. These provisions extend the anti-dumping, countervailing, and safeguarding measures provisions as laid out in GATT (1994).

2. **The DCFTA seeks to further spur trade by harmonizing customs services.** To this end, Ukraine will approximate the EU Modernised Community Customs Code, and both treaty partners will seek to cooperate on customs and transit services. More generally, the DCFTA contains many 'harmonizing' provisions, on – for instance – technical standards for goods and sanitary and phytosanitary measures. In most cases, this implies that Ukraine commits to adopting approximate EU standards.

3. **The trade liberalisation measures in the DCFTA are not restricted to trade in goods, but also cover services.** Under the Agreement, treaty partners gain rights to the establishment of enterprises and the temporary presence of natural persons for business purposes in treaty countries. Furthermore, these enterprises and entrepreneurs are to be regulated by Ukraine and the EU through regulations that are as similar as possible, for instance through harmonised licensing regulations.

4. **The public sector is also covered by the DCFTA**. Public procurement markets are to be opened up to treaty partner country entities, subject to the condition that Ukraine adopts key EU public procurement rules and regulations. Further laws that are to be altered under DCFTA cover intellectual property rights, competition policy, information gathering, and dissemination (e.g., economic statistics). Additional harmonisation of standards in the DCFTA is to be fostered through (economic) cooperation with regard to financial services, transport, energy, the environment, communications, consumer protections, corporate law and governance, labour and social policy, and education and science, among other areas.

5. **The DCFTA also lays out several legal and institutional provisions covering its own nature and implementation.** For example, the DCFTA contains provisions on the ratification and application of the agreement, the monitoring of the (implementation) of the DCFTA, and the way in which Ukraine is to approximate EU standards and regulations. Lastly, it also contains a comprehensive dispute settlement system.

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[2]   We here generally omit specific (sectoral, regulatory, etc.) examples or cases and limitations to the DCFTA provisions. In addition to Emerson & Movchan (2016), we refer the reader to Van der Loo (2016) for an accessible description of the DCFTA.

2.3 Previous studies on the DCFTA impact on the EU

There have been several previous studies on the economic effects of the EU-Ukraine DCFTA on treaty partner countries' trade and welfare.[3] In this section we summarise the findings of these studies, which typically report only the estimated impact on the EU as a whole. We are not aware of any previous studies that have separately estimated the impact of the DCFTA on the Dutch economy.

The economic effects of the EU-Ukraine DCFTA estimated by previous studies are typically positive but small for the EU, while the effects on Ukraine are typically positive and large. In the summary below, as in the remainder of this report, we focus on the impact on the EU.

Maliszewska et al. (2009) employ a computable general equilibrium model (CGE) to estimate the effects of the reduction in tariffs and non-tariff barriers outlined by various FTAs (Armenia, Azerbaijan, Georgia, Russia and Ukraine). For the EU27, Maliszewska et al. (2009) reports welfare gains (equivalent variation) equal to 0.09% as a result of an FTA with Ukraine. Total EU27 exports are estimated to rise by 0.26%, and total EU27 imports by 0.28%. Like the other reports discussed below, they do not report estimated effects for the Netherlands separately.

Ecorys (2007) also uses a CGE model to estimate the impact of the EU-Ukraine DCFTA. They consider two scenarios: a limited FTA and an extended FTA. Under both scenarios, the assumption was that Ukraine would ascend to the WTO, which in fact happened in 2008. Ecorys (2007) estimates a 0.007% welfare gain for the EU27 in the short run (which is the same for both scenarios), and between a 0.009% and 0.011% welfare gain in the long run.

Emerson et al. (2009) perform a similar analysis. Their CGE model suggests that the EU-15 would gain between 0.00% and 0.01% in welfare the short run, and 0.01% and 0.02% in the long run depending on the extensiveness of the DCFTA. Their estimated effects may be slightly larger because they also consider the ascension of several countries in the Southeast Europe and Caucasus region into the European internal market that presently have not entered into this market.

To put these numbers in some perspective, Francois and Manchin (2009) study the impact of a potential FTA between the EU and the Commonwealth of Independent States. Based on their analysis using a CGE model, the EU stands to gain between 0.14% and 0.21% in real GDP from such a hypothetical agreement. Once more, the various scenarios they consider account for the spread between these figures.

Some studies also chart the effects of the DCFTA for specific sectors and liberalisations. For instance, Von Cramon-Traubadel et al. (2010) study the effect of the liberalisation of trade in agricultural produce that was eventually included in the EU-Ukraine DCFTA. Using a CGE model, they report welfare gains worth between roughly $400 and $550 million (0.00%) for the EU25 depending on the DCFTA scenario considered.[4]

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[3] In the context of our gravity model, welfare is equal to real GDP, but in CGE models, welfare and real GDP may be slightly different.

[4] In their first scenario, Von Cramon-Traubadel et al. (2010) consider a reduction of bilateral tariffs on agricultural goods by 50%. In their second scenario, they also factor in a 5% Ukrainian productivity growth in the agricultural sector.

3 Recent Economic Developments

In this section we discuss a number of recent economic developments that are of direct relevance to the analysis of the effects of the free trade agreement between the EU and Ukraine. We find that trade flows are affected to an important extent by developments in Ukraine. However, it is too early to say whether recent increases in trade between Ukraine and the Netherlands can be attributed to the DCFTA.

3.1 Recent Economic Developments in Ukraine

Like other countries in Eastern Europe, Ukraine has had a volatile economic performance since the collapse of the Soviet Union in 1991. During the 1990s, GDP first contracted sharply for nearly a decade. Since 2000, the Ukrainian economy then grew rapidly until the global economic crisis of 2008-09. Figure 3.1 shows that, in terms of GDP growth, the Ukrainian economy was particularly hard hit, with a GDP contraction of 15% in 2009. However, the economy recovered relatively quickly in 2010, a development shared with countries such as Hungary, Romania and Poland.

Figure 3.1   Compared to its neighbouring EU countries, Ukraine was hit hard by the 2009 global financial crisis, but recovered quickly in 2010.
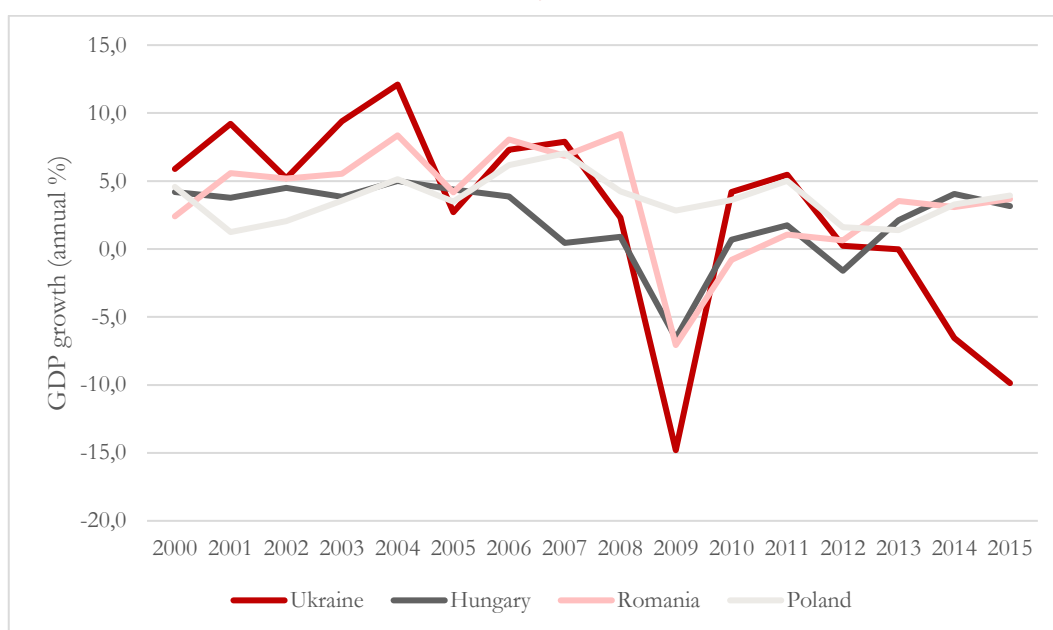
Source: SEO Amsterdam Economics, based on World Bank.

A remarkable development in Ukraine is the negative GDP growth in 2014-2015. While GDP in countries such as Hungary and Romania continued to recover during 2013-2015, Ukrainian GDP shrank by 6.5% in 2014 and by nearly 10% in 2015.

The key reason for this second recession in a decade is the armed conflict in eastern Ukraine that followed the Russian annexation of Crimea in early 2014. Given that the affected Donbass regions

of Donetsk and Luhansk used to be important economic regions for Ukraine, the conflict had a significant impact on Ukraine's GDP and exports (CIA 2017).

Another factor that is likely to have affected Ukraine's economy is the fact that the Russian economy, its major trade partner, also experienced a major slowdown since 2012 and an actual GDP contraction in 2015. This is generally seen as reflecting the combination of falling oil prices and economic sanctions, including the economic quasi closure of international financial markets to Russian entities (IMF, 2016b). This in turn affected countries for which Russia is the key trade partner, including Ukraine and Belarus.

As a result of the economic recession in Ukraine, per capita income has fallen substantially. As Figure 3.2 shows per capita GDP in Ukraine fell from roughly US$4000 in 2013 to US$2115 in 2015.[5] After Moldova, which is even poorer, Ukraine has the lowest level of per capita income in the region.

Figure 3.2   After Moldova, Ukraine has the lowest GDP per capita in the region
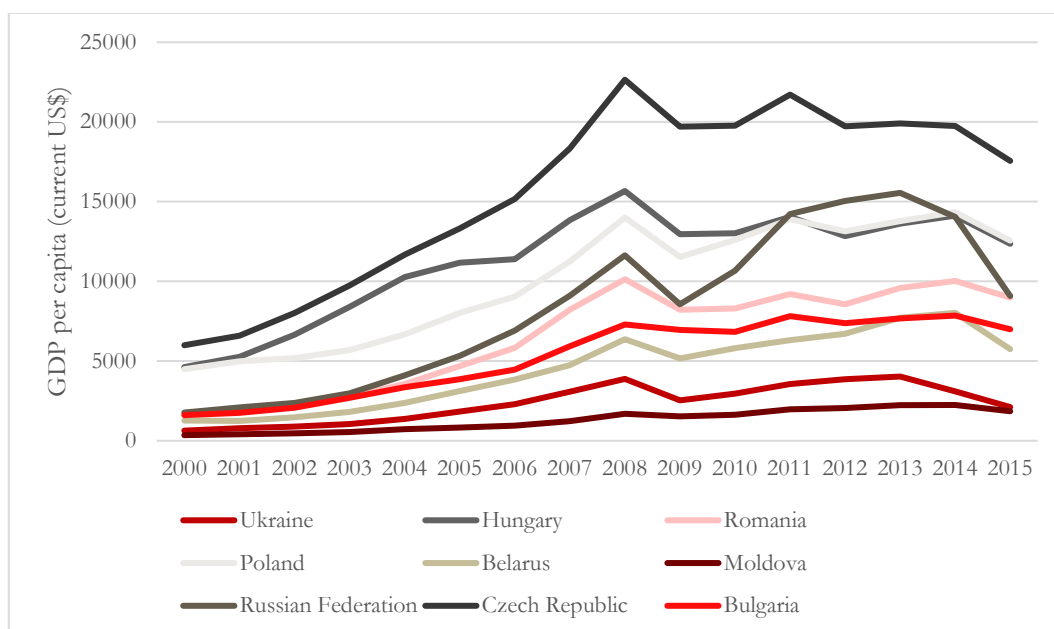
Source: SEO Amsterdam Economics, based on World Bank

The Ukrainian economy appears to have started recovering in 2016. As Figure 3.3 shows, the decline started tapering off from the second quarter of 2015, and since 2016 the economy has shown positive (year-on-year) GDP growth rates. The IMF projects GDP growth at 1.5% for 2016 and 2.5% for 2017 (IMF 2016b). However, the risks to growth are generally considered to remain high, due to a difficult global environment, the ongoing conflict in the eastern part of the country and slow progress with implementing further economic reforms (World Bank 2017).

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[5]   It is unclear to what extent these GDP estimates take into account the country's considerable shadow economy, which comprises an estimated 44% of total GDP (Vinnychuk & Ziukov, 2013).

Figure 3.3   Since 2016, Ukrainian GDP is on the rise again
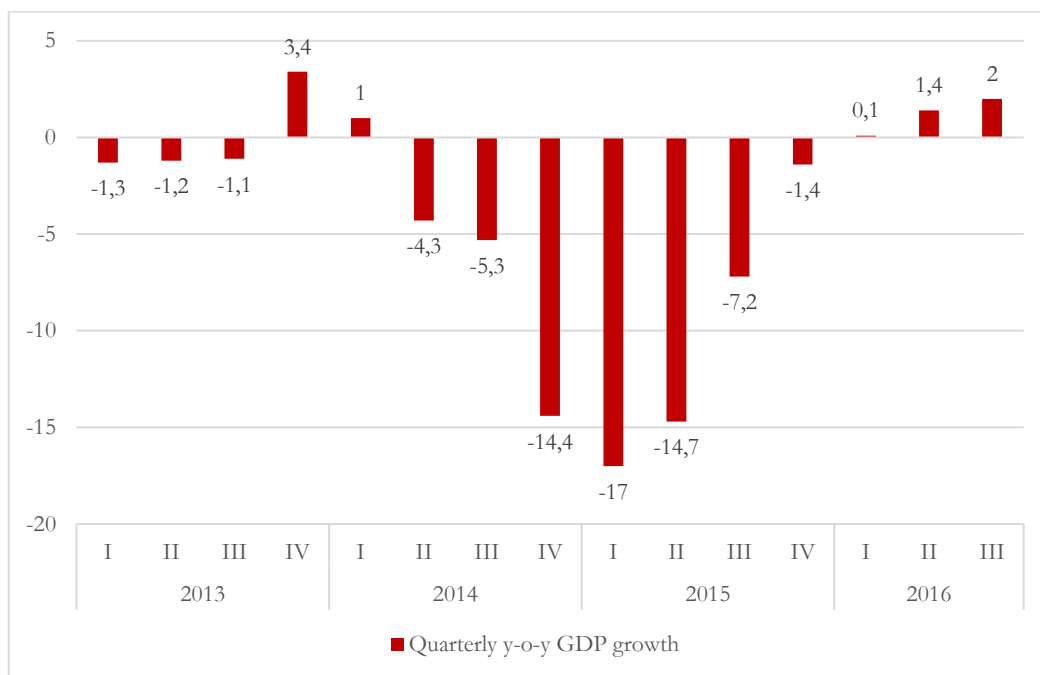
Source: SEO Amsterdam Economics, based on State Statistics Service of Ukraine

Heavy industry is a key sector for the Ukrainian economy. Important economic subsectors are coal mining and ageing heavy industries such as shipbuilding, steel and arms. Many of these industries are considered energy inefficient and were heavily subsidised in the past, including with subsidised gas from Russia. Ukraine's main export categories are iron and steel products (manufactured) and iron ore (non-manufactured). Ukraine also exports manufactured products, ranging from electric wire to gas turbines (Comtrade 2017).

Agriculture is the other key economic sector. Ukraine has vast areas of arable land and is a major producer and exporter of maize, wheat, barley, sunflower seeds and sunflower oil (UN Comtrade 2015). It also produces sugar beets, vegetables, beef and milk (CIA 2017).

Since 2013, the EU has surpassed Russia as Ukraine's key export destination. As Figure 3.4 shows, the share of Russia in total Ukrainian goods exports declined from nearly 30% in 2011 to 13% in 2015, while the share of the EU increased from 26% to 34% during the same period (Comtrade 2017). Eastern Europe and Central Asia (including Turkey) are important export destinations as well, as are China and India. Egypt is an important export destination for Ukrainian grain.

Figure 3.4   Since 2013, the EU has surpassed Russia as Ukraine's key export destination
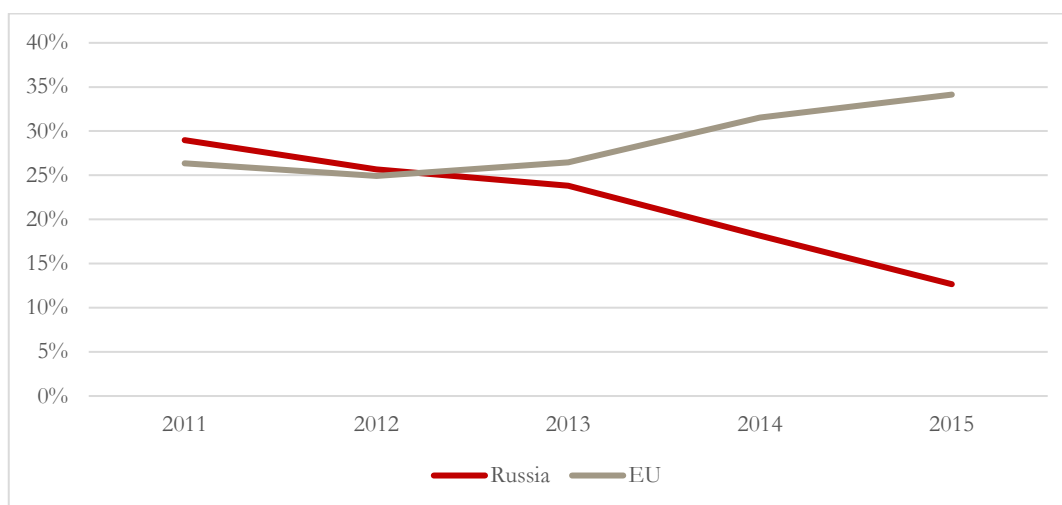
Source: SEO Amsterdam Economics based on Comtrade

In nominal U.S. dollar terrms, Ukraine's exports to the EU were broadly stable during 2011-2014 but declined significantly during 2015. Ukraine's key exports to the EU consisted of iron and steel products, sunflower and rape seeds and oil, wheat, maize and machinery and transport equipment. Figure 3.5 shows, the decline in exports to the EU during 2015 was mostly driven by a drop in manufactured goods exports. This in turn was likely the result of a production decline related to the armed conflict in the Donbass region. Other exports to the EU remained broadly stable (Comtrade 2017).

In U.S. dollars, Ukrainian exports to Russia (which mostly have consisted of iron, steel and machinery) shrank by more than 75% between 2011 and 2015. As Figure 3.5 shows, the main contractions occurred in exports of machinery (-81%) and food products (-86%). Following Ukraine's signature of the Association Agreement in 2014, Russia imposed import bans on Ukrainian food products, officially for sanitary reasons (Van der Loo, 2016). Food exports to Russia were nearly zero in 2015 (Comtrade 2017).

Figure 3.5   Exports to Russia contracted by 75% between 2011 and 2015

Ukranian exports to the EU   **Ukrainian exports to Russia**
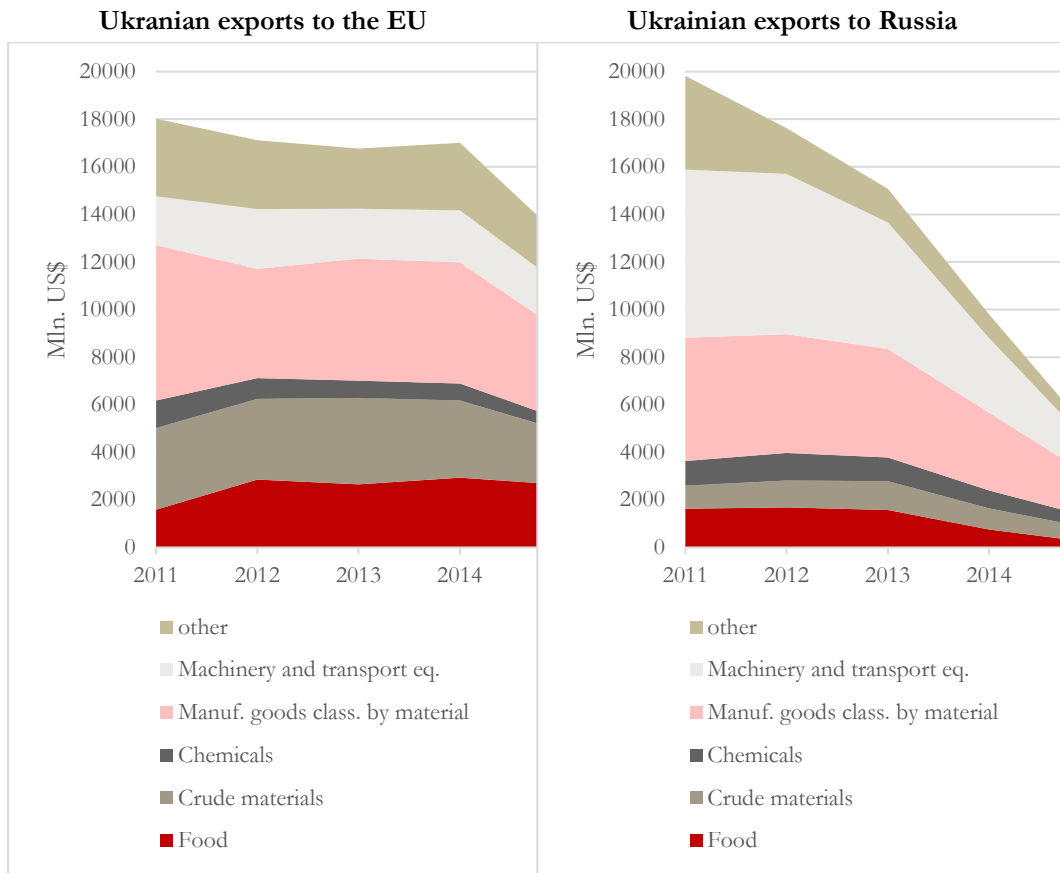
Source: SEO Amsterdam Economics based on Comtrade

3.2   Dutch Exports to Ukraine

Dutch exports to Ukraine declined in 2009 and between 2012-2015, but recovered slightly in 2016. As Figure 3.6 shows, Dutch exports to Ukraine have averaged around 0.25% (€1 billion) of total Dutch exports between 2012 and 2016, and nearly halved during this period, from 0.3% of total Dutch exports in 2012 (nearly €1.3 billion) to 0.15% in 2015 (€642 million). The earlier sharp drop in 2009 was likely related to the global economic crisis, when Ukrainian GDP fell by nearly 15%. The drop in 2013-2015 was likely related to the conflict in eastern Ukraine, which caused Ukrainian GDP to fall by around 6.5% in 2014 and by nearly 10% in 2015. In 2016, Dutch exports to Ukraine recovered from 0.15% to 0.18% (€758 million) of total Dutch exports.

Figure 3.6   Dutch exports to Ukraine declined significantly between 2012-2015, but recovered in 2016
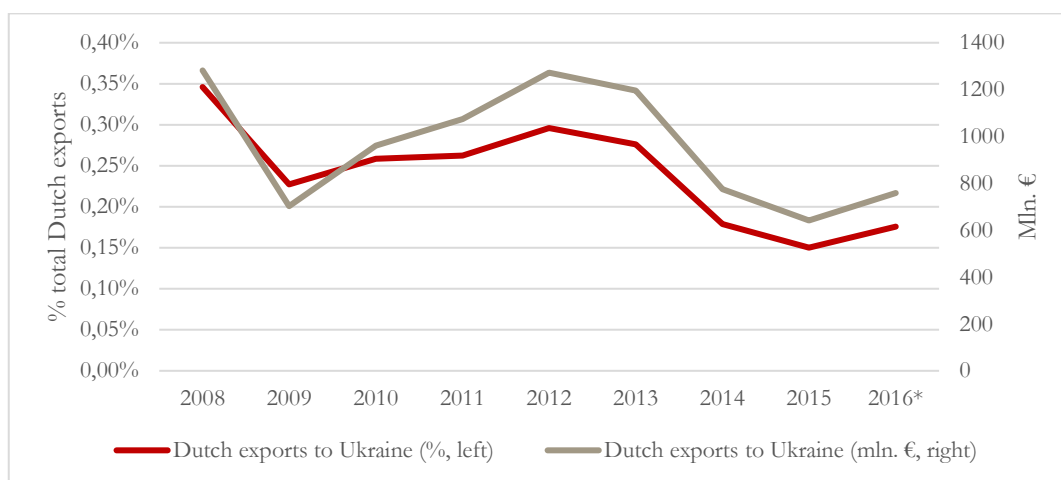
Source: SEO Amsterdam Economics, based on Statistics Netherlands (CBS)[6]

Other EU countries witnessed similar drops in exports to Ukraine in 2009 and during 2012-2015. As Figure 3.7 shows, exports from Germany, Belgium and Denmark all fell sharply first in 2009, and again in 2014 and 2015. The drop in exports in 2009 was not as low for the United Kingdom as for the other countries, and occurred one year later. Belgium saw the largest rise in exports between 2009 and 2015. All countries saw their exports decline after 2012 (except for Denmark, which had declining exports since 2013). Consistent EU data for 2016 are not yet available.

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[6]   Data on 2016 are projection by SEO Amsterdam Economics based on sectoral year-on-year growth observed during the first 10 months of 2016

Figure 3.7   Exports to Ukraine show similar patterns among western European countries
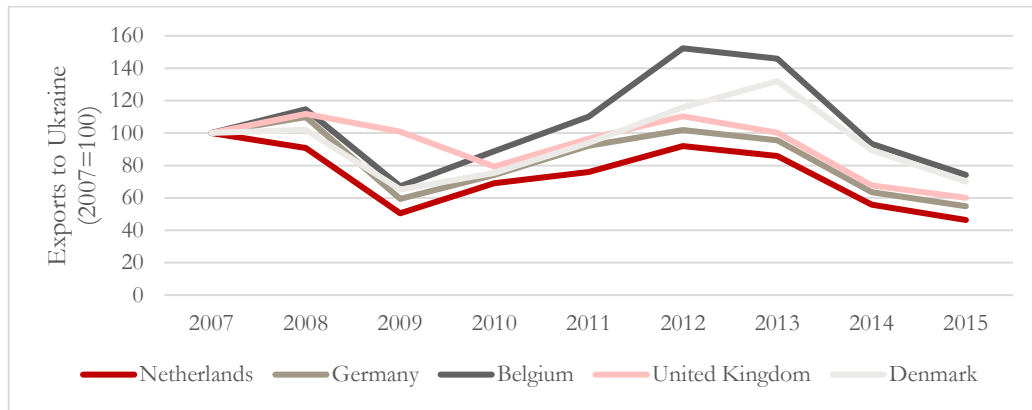
Source: SEO Amsterdam Economics, based on Comtrade

Dutch exports to Ukraine's EU neighbours did not decline during 2013-2015, while Dutch exports to Russia and Belarus did decline. As Figure 3.8 shows, Dutch exports to Slovakia, Hungary, and Romania generally kept rising since 2012, suggesting that the same may have happened to Dutch exports to Ukraine were it not for the conflict in Eastern Ukraine. On the other hand, Figure 3.9 shows that Dutch exports to Russia, Belarus and – to a lesser extent – Moldova declined as well. Further research would need to be conducted to assess to what extent this was also related to the conflict in Ukraine, or whether it could in part be driven by spillovers related to the slowdown in Russia caused by lower oil prices and economic sanctions.

Figure 3.8   Dutch exports to Ukraine fell since 2012, while Dutch exports to neighbouring EU countries kept rising.
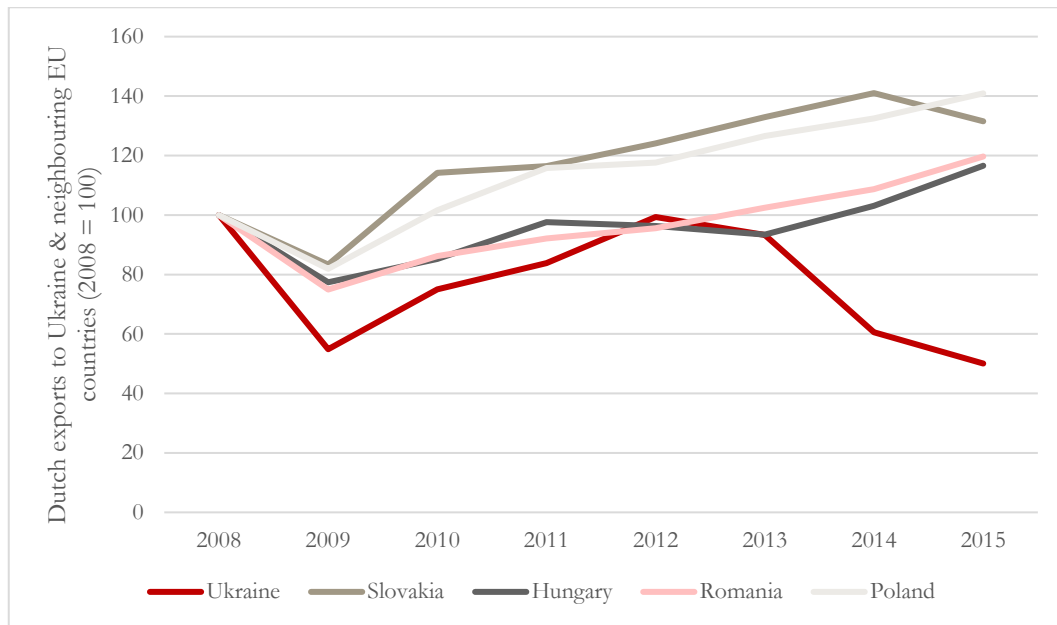
Source: SEO Amsterdam Economics, based on Statistics Netherlands (CBS).

Figure 3.9   Dutch exports to Ukraine, Belarus, and Russia all fell in recent years.
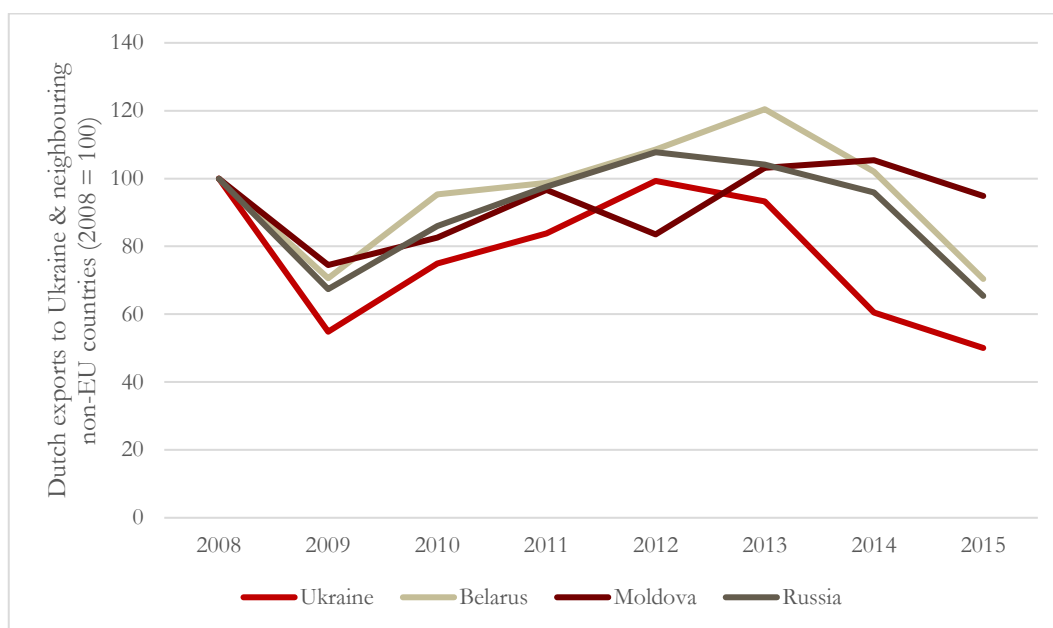
Source: SEO Amsterdam Economics, based on Statistics Netherlands (CBS)

Exports of machinery and transport equipment have thus far been the most important sector for Dutch exports to Ukraine. As Table 3.1 shows, these exports averaged €447 million per year between 2007 and 2015, or about 44% of total Dutch exports to Ukraine, which averaged €1 billion annually during the same period.[7] These exports have mainly comprised trucks, high-tech machinery (parts) and agricultural and food processing machinery.

Other important Dutch sectors for exports to Ukraine are chemicals and agriculture. Chemicals has thus far been the second most important export category, consisting mainly of (veterinary) medicines and plastics. Agricultural exports have mainly consisted of flower bulbs and cut flowers, cocoa butter and paste (due to the large role that the Netherlands plays in cocoa trade and processing), fruits and agricultural seeds. The Netherlands has also been exporting agricultural machinery to Ukraine, mostly consisting of food processing machines and poultry keeping machines.

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[7]   This study makes use of the Comtrade database, which consists of gross import and export data of goods for all countries in the world. There is no data on value added exports to Ukraine (there is a value added database, TiVA, but this does not contain data on Ukraine) and there is no detailed data on services exports to Ukraine (there is a services exports database, EBOPS, but for services exports and imports between the Netherlands and Ukraine it only gives a total figure). Total Dutch services to Ukraine consisted of $333 million in 2013, against $906 million of goods exports, which is roughly a quarter of all exports. Note that these are gross values, so not taking into account the value added in the Netherlands. This means, for example, that import-export transits with little value added in the Netherlands are counted fully in the export data.

Table 3.1   The Netherlands exports mainly trucks, high-tech machinery parts, medicaments and
             flower bulbs to Ukraine[8]

Main category	Export in mln. € av. 2007-2015	Perc.	Top-20 subsectors	Export in mln. € av. 2007-2015	Perc.
Machinery and transport eq.	€ 447	44%	Motor vehicles for the transport of goods	€ 69	7%
			Parts of office and autom. data processing machines	€ 50	5%
			Automatic data-processing machines	€ 44	4%
			Telecom eq. and parts, other	€ 37	4%
			Road motor vehicles, other	€ 26	3%
			Agricultural machinery and parts (excl. tractors)	€ 24	2%
			Monitors and projectors, reception app. for tv	€ 19	2%
			Office machines	€ 17	2%
			Electrodiagnostic app. for medical purposes, and radiological app.	€ 15	2%
Chemicals	€ 199	19%	Food-processing machines and parts	€ 15	1%
			Medicaments (incl. veterinary med.)	€ 55	5%
			Polymers of ethylene	€ 27	3%
			Perfumery, cosmetic or toilet preparations (excl. soaps)	€ 19	2%
			Other chemical products	€ 16	2%
Food	€ 120	12%	Cocoa	€ 37	4%
			Fruit and nuts, fresh or dried	€ 13	1%
Manufactured goods	€ 71	7%	Pig-iron, spiegeleisen, sponge iron, etc.	€ 13	1%
Crude materials	€ 66	6%	Crude vegetable materials (flowers and bulbs)	€ 56	5%
Other manuf. aritcles	€ 63	6%			
Other	€ 18	2%	Special transactions and comm.	€ 18	2%
Mineral fuels	€ 16	2%	Petroleum oils and oils obtained from bituminous minerals	€ 15	1%
Beverages & tobacco	€ 14	1%			
Animal & veg. oils	€ 4	0%			
All commodities	**€ 1.025**	**100%**			

Source: SEO Amsterdam Economics based on Comtrade

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[8]   Note that sectoral exports do not add up exactly to total exports, due to inconsistencies in the original data.

Most of the fluctuations in Dutch exports to Ukraine are explained by fluctuations in Dutch exports of machinery and transport equipment. Judging from Figure 3.10 which shows the sectoral breakdown of Dutch exports to Ukraine between 2008 and 2016, machinery and transport equipment is by far the most volatile category and the one that collapsed the most during 2009 and 2014. This could be because purchase of machinery are easier to postpone during a crisis than, for example, purchases of food. Dutch exports of machinery to Ukraine are also likely dominated by several large and expensive machines, such as automatic data processing machines or agricultural machinery, so that even the postponement or cancellation of one such large order could significantly affect total machinery exports to Ukraine.

Figure 3.10   Most of the fluctuations in Dutch exports to Ukraine are explained by fluctuations in exports of machinery and transport equipment.
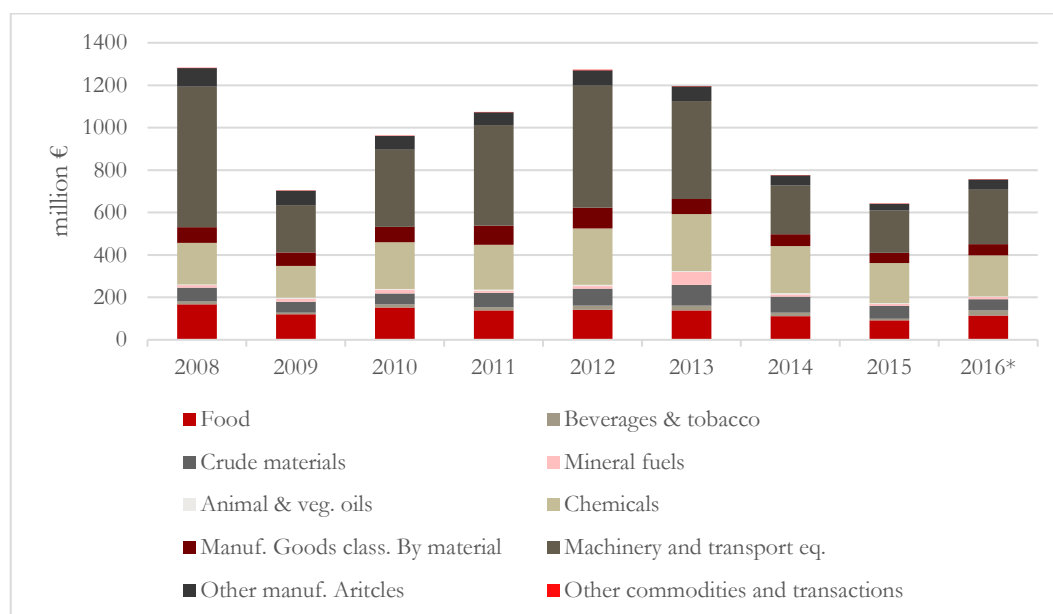
Based on currently available data through November 2016, it appears that there has been substantial export growth in 2016. During the first 11 months of 2016, Dutch exports to Ukraine rose by 18%, mostly driven by a 28% increase in machinery and a 27% increase in food exports. In the absence of other information, we assume that that year-on-year export growth during December 2016 in each sector equaled the average year-on-year growth during the first 11 months of 2016 in that sector. This yields a prediction for overall export growth in 2016, which happens to also be equal to 18% (a growth of €117 million relative to 2015). The final official estimate for 2016 should become available in the coming months.

While 18% export growth seems promising, it is difficult to attribute this export growth to the DCFTA. It could also be simply a recovery from earlier drops in exports that occurred during the global financial crisis (2008/2009) and the recent political situation in eastern Ukraine (2014/2015). Looking at monthly export data reveals that the recovery in Dutch exports to Ukraine appears to have started already in 2015, reflecting a rebound from the earlier drop. Figure 3.11 shows the

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[9]   Data on 2016 are projection by SEO Amsterdam Economics based on sectoral year-on-year growth observed during the first 11 months of 2016

monthly year-on-year growth rates (i.e., the growth rate with respect to exports during the same month one year earlier). This shows that since the end of 2015, Dutch exports to Ukraine have shown positive year-on-year growth rates on average. In fact, the recovery may have started even earlier (depending on one's definition of 'recovery'), as year-on-year growth rates have generally improved since February 2015 (i.e., they became less negative during 2015).

Figure 3.11   Monthly export data suggest that Dutch exports to Ukraine started recovering in 2015, with export growth turning positive again in 2016.
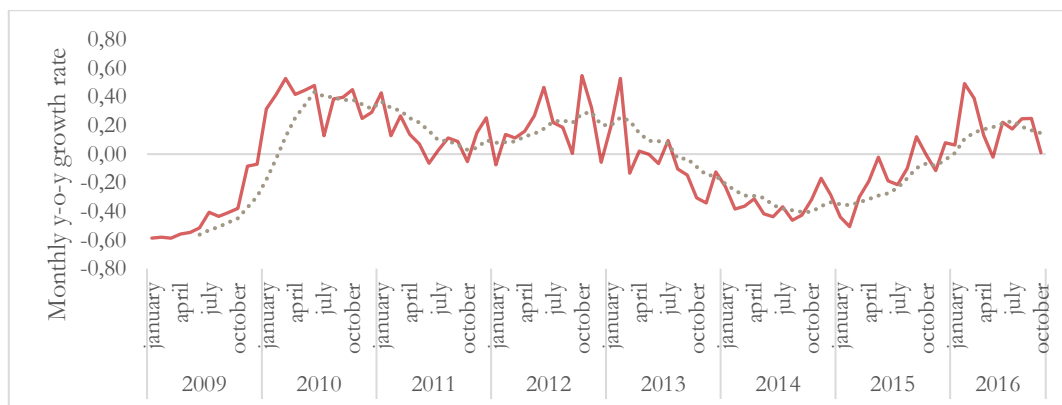
Source: SEO Amsterdam Economics, based on Statistics Netherlands (CBS). Dotted line = moving average.

The recovery of Dutch goods exports to Ukraine appears to have been mostly driven by food, machinery and transport equipment, and manufactured goods categories. As Figure 3.12 shows, exports to Ukraine started to recover (become less negative) in early 2015, and started to show positive growth from the end of 2015. Dutch exports of chemicals and machinery & transport equipment (e.g. medicaments, primary plastics, telephone sets, trucks,) were mostly responsible for this positive trend, but Dutch food exports (particularly cocoa, and baby milk formula) and other exports (e.g., flowers and bulbs and seeds (for sowing)) were also on the rise in 2016.

Figure 3.12   The main sectors that contributed to 2016 Dutch export growth to Ukraine are machinery and transport equipment and food.
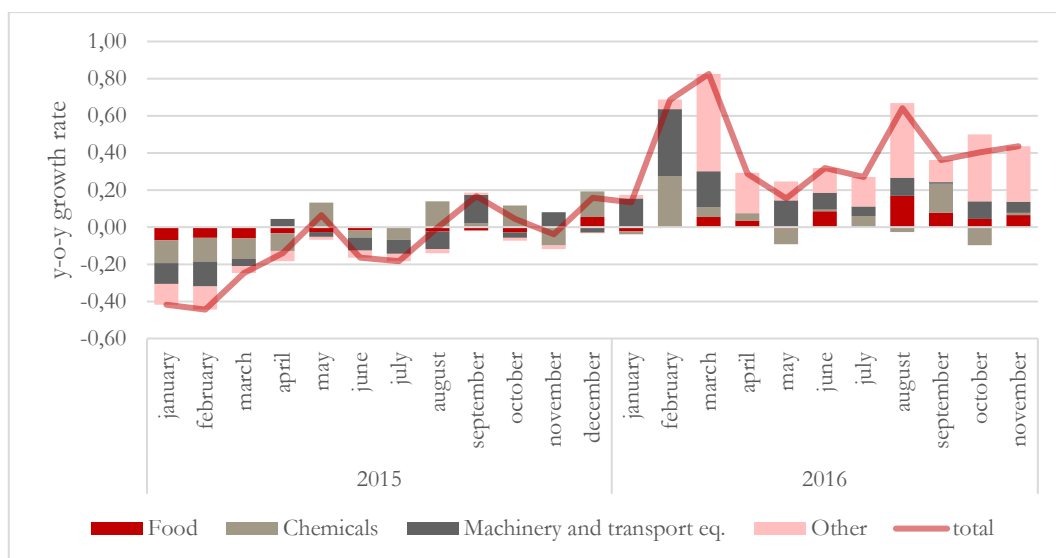
Source: SEO Amsterdam Economics, based on Statistics Netherlands (CBS)

3.3   Dutch Imports from Ukraine

Dutch imports from Ukraine are a small percentage of total Dutch imports, but rose between 2010 and 2015. As Figure 3.13 shows, Dutch imports from Ukraine as a percentage of total imports fell in 2009 and in 2010, possibly as a consequence of the global financial crisis.. Since 2010, the share of Dutch imports from Ukraine has been on a rising trend, despite small drops in 2012 and 2014. Dutch imports from Ukraine averaged 0.17% (€618 million) between 2008 and 2016, and doubled in six years from 0.11% in 2010 to 0.22% in 2015. In euro terms, this was an increase from €373 million to €835 million.

Figure 3.13   Dutch imports from Ukraine have doubled between 2010-2015, but constitute only a small share of total Dutch imports
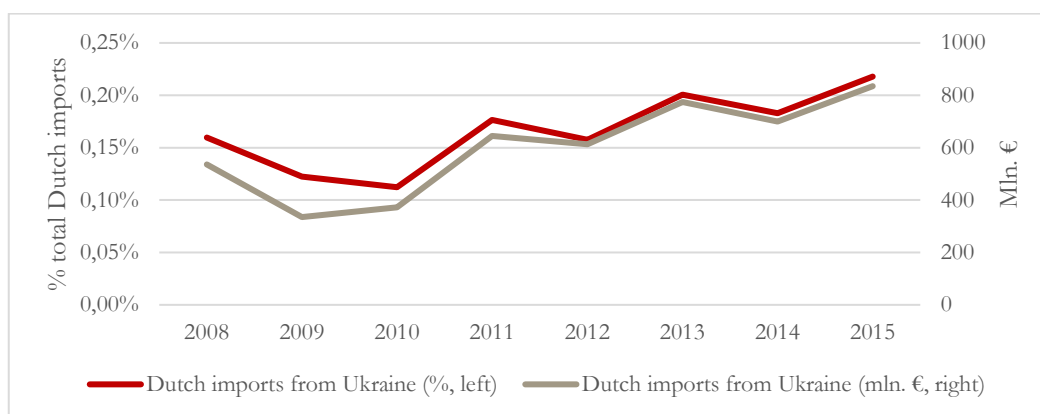
Source: SEO Amsterdam Economics based on Statistics Netherlands (CBS) [10]

Other western European countries saw similar import patterns between 2008 and 2015. As Figure 3.14 shows, the Netherlands, Belgium and the United Kingdom had broadly growing imports from Ukraine between 2009 and 2014, while German and Danish imports from Ukraine remained roughly stable during this period. In U.S. dollar terms, Germany imported more than five times as much as the Netherlands from Ukraine in 2007. In 2015, however, it imported only twice the Dutch amount. This is because Dutch imports from Ukraine rose much faster than German imports.

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[10]   These figures are based on Statistics Netherlands (CBS) data, showing Dutch imports from Ukraine. Ukrainian export data (Comtrade) show roughly the same trends, but slightly different numbers. Since this report is written for a Dutch audience, the Dutch import data are used.

Figure 3.14   Between 2009 and 2014, imports from Ukraine broadly increased for the UK, the Netherlands and Belgium. German and Danish imports from Ukraine remained roughly stable.
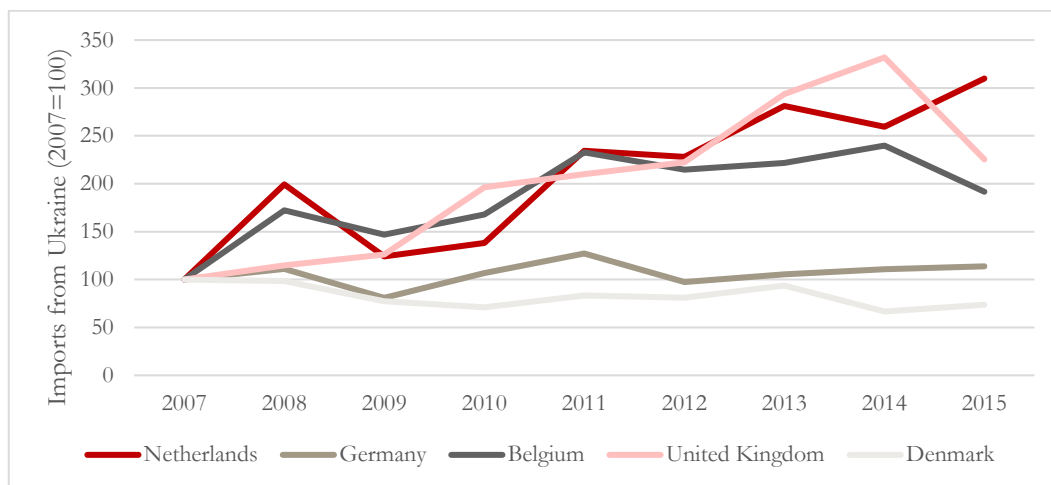
Source: SEO Amsterdam Economics, based on Comtrade

The increase in Dutch imports from Ukraine during 2009-2015 is broadly similar to the increase in Dutch imports from Ukraine's neighbours Poland and Romania. Figure 3.15 shows that Dutch import growth from Ukraine between 2008 and 2015 was similar to the Dutch import growth from Poland and Romania. However, Dutch imports from Ukraine's other EU neighbours, Slovakia and Hungary, remained broadly stable during this period.

Figure 3.15   Dutch imports from Ukraine, Romania and Poland gradually rose between 2008 and 2016
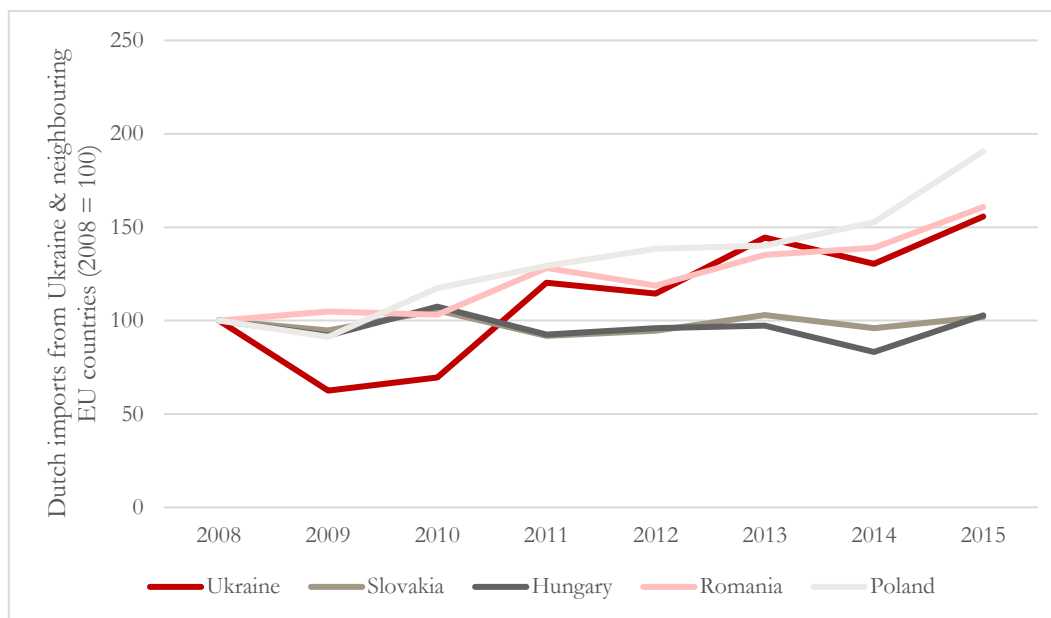
Source: SEO Amsterdam Economics, based on Statistics Netherlands (CBS)

Dutch imports from Ukraine's non-EU neighbours have been more volatile. As Figure 3.16 shows, imports from Belarus and Moldova show some volatility but an upward trend in more recent years. Russian imports from Ukraine grew between 2009-2013, but have declined since 2014.

Figure 3.16   Dutch imports from Ukraine rose gradually between 2009 and 2015, but imports from non-EU neighbouring countries were more volatile
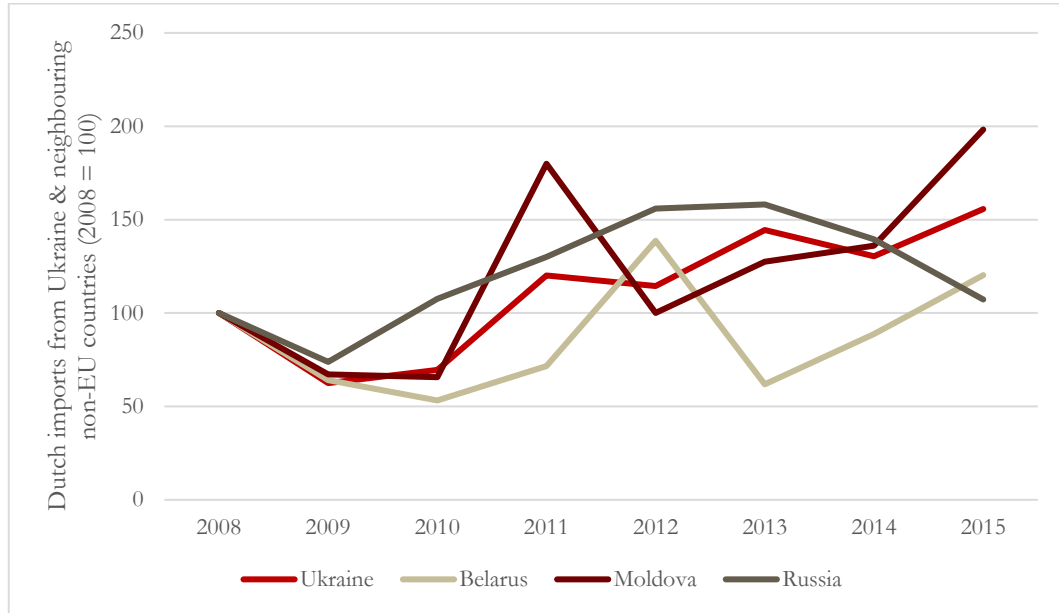
Source: SEO Amsterdam Economics, based on Statistics Netherlands (CBS)

So what does the Netherlands import from Ukraine? As Table 3.2 shows, the main Dutch import categories from Ukraine are food, crude materials, and animal and vegetables oils.

Food imports are the largest import category, which accounted for an average annual €154 million in Dutch imports between 2007 and 2015, or 27% of all Dutch imports from Ukraine. Food imports have thus far mainly consisted of grains, such as maize (€105 million per year on average), animal feed and wheat. Another quarter of Dutch imports from Ukraine consist of crude materials (€142 million per year on average), mainly sunflower and rape seeds for oil (€128 million per year). Processed sunflower and rape seed oil is one more important import category, comprising 16% of total Dutch imports from Ukraine during 2007-2015 (€88 million per year on average. Other import categories are machinery and transport equipment(€46 million, or 8%), such as office machines and ships, as well as manufactured goods (€45 million, 8%) which mainly comprises pig iron.

Table 3.2   Main imported goods from Ukraine are maize, simply manufactured iron and sunflower and rape seed oil[11]

Main category	Import in mln. € av. 2007-2015	perc.	Top-10 subsectors	Import in mln. € av. 2007-2015	
Food	€ 154	27%	Maize, unmilled	€ 105	19%
			Feeding stuff for animals	€ 15	3%
			Wheat and meslin, unmilled	€ 10	2%
Crude materials	€ 142	25%	Oil-seeds	€ 128	23%
			Wood, simply worked	€ 8	1%
Animal & veg. oils	€ 88	16%	Fixed vegetable fats and oils	€ 88	16%
Machinery and transport eq.	€ 46	8%	Office machines	€ 18	3%
			Ships and boats	€ 16	3%
Manufactured goods class. by material	€ 45	8%	Pig-iron, spiegeleisen, sponge iron, etc.	€ 15	3%
Mineral fuels	€ 35	6%	Petroleum oils	€ 26	5%
Other manufactured articles	€ 18	3%			
Chemicals	€ 13	2%			
Other	€ 6	1%			
Beverages & tobacco	€ 0	0%			
Total goods imports	**€ 561**	100%			

Source: SEO Amsterdam Economics, based on Comtrade

A sectoral breakdown of imports per year shows that the rise in Dutch imports from Ukraine has been almost exclusively driven by increased food imports. As Figure 3.17 shows, the Netherlands hardly imported food from Ukraine before 2011, €10 to €16 million annually. However, from 2011 onwards and against the trends in other goods, Dutch food imports from Ukraine rose by around 30 times, to €426 million in 2015.

Other Dutch imports from Ukraine have been more volatile. Crude material imports (mainly sunflower oil seeds) nearly doubled to €273 million in 2013, and then fell back to around a quarter of that level between 2014 and 2016. Vegetable oils, on the other hand, fell sharply in 2012 (virtually disappearing altogether), and have been gradually increasing since then, particularly in 2016. Manufactured goods imports (mainly iron products) fell in 2014 but are now on the rise, while imports of machinery and transport equipment have been the most stable category.

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[11]   Note that sectoral imports do not add up exactly to total imports, due to inconsistencies in the original data.

Figure 3.17   Dutch imports from Ukraine have been on the rise since 2012
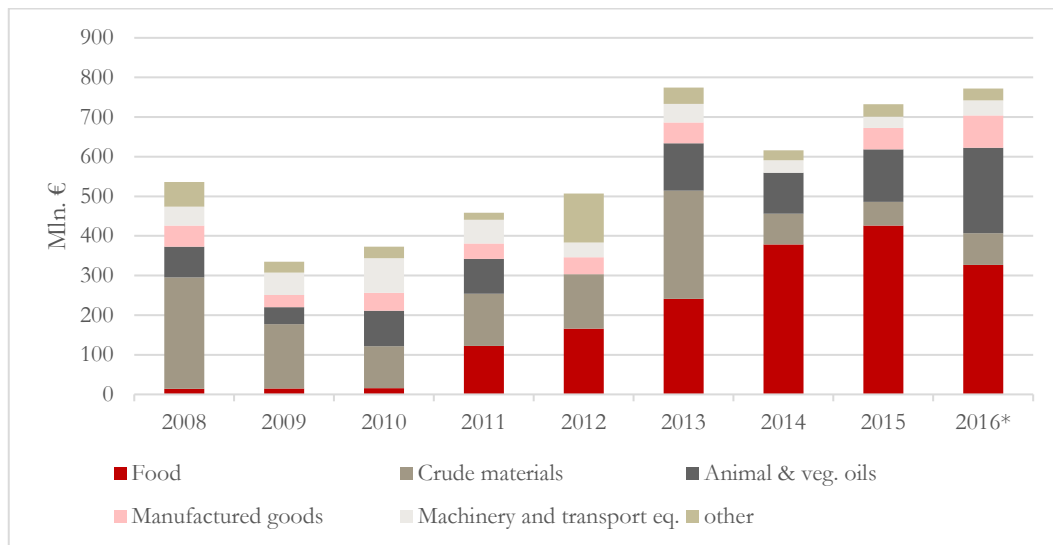
The sharp rise in food imports from Ukraine has been driven largely by rapidly growing imports of cereals, particularly maize (corn). Other reasons for the increase are rising imports of feeding stuff for animals, which main ingredient is likely Ukrainian grain as well, and increased imports of meat in 2014 and 2015.

If we zoom in on food imports from Ukraine in Figure 3.18, we see that on average around 75% of these food imports consist of cereals, which in turn is mostly maize. Another part is animal feed, which is probably based on cereal as well. The residual category of "other food imports" has generally been small but increased in 2014 and 2015 because of meat imports.

The drop in Dutch food imports from Ukraine in 2016 is likely related to maize as well. According to Ukrainian statistics, maize (corn) exports to the Netherlands fell by 42% (year on year) in the first eleven months of 2016. This drop could reportedly be caused by a reorientation of Ukrainian cereals exports to other markets, in particular to Iran. However, we have not been able to confirm this yet. In any case, the drop in food imports appears to have been more than offset by an increase in imports of vegetables oils and manufactured goods.

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[12]   Data for 2016 are sectoral projections by SEO Amsterdam Economics based on extrapolations of sectoral year-on-year growth rates observed during the first 11 months of 2016. Note that the sum of sectoral contributions to import growth does not add up exactly to total import growth, due to some inconsistencies in the original source data.

Figure 3.18   Dutch food imports from Ukraine consist for 75% of cereals
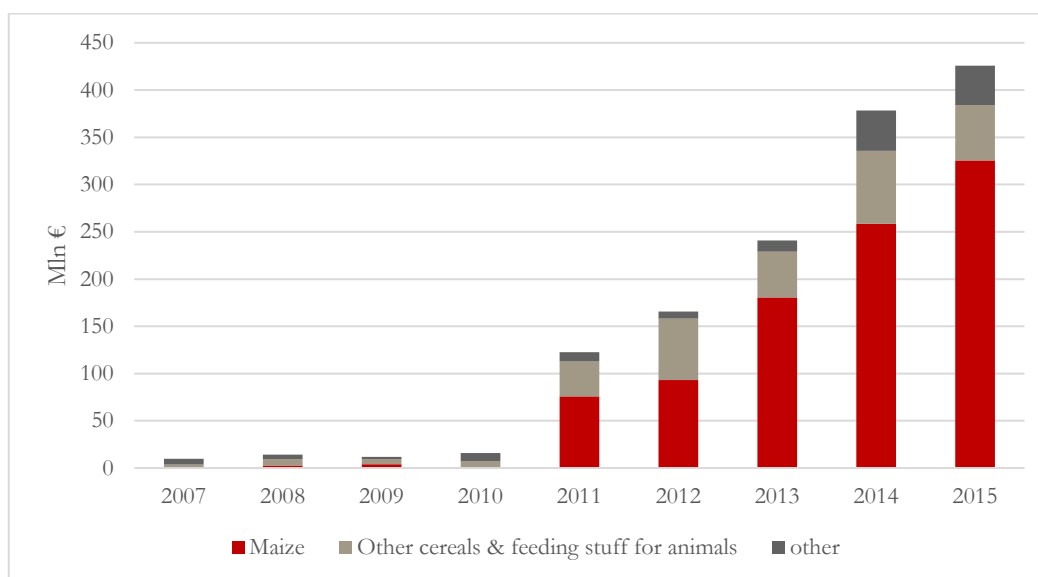
Based on sectoral monthly import data, Dutch imports from Ukraine have thus far increased by 5% year-on-year during the first 11 months of 2016 (relative to the first 11 months of 2015). However, monthly import growth in the past two years has been quite volatile, mostly driven by fluctuations in food imports.

Another factor that severely complicates the analysis of import growth during 2016 is that there are major inconsistencies in the data: in particular, the reported data on Dutch imports from Ukraine by sector do not add up to the reported total for certain years.[13] As shown above, total year-on-year import growth computed when adding up reported imports over all sectors is 5% during the first 11 months of 2016. However, based on reported total imports, total imports dropped by 10% during the first 11 months.[14] For this reason, we will not further analyse the reported changes in imports during 2016.

In summary, it is too early to assess whether the DCFTA has had any impact on Dutch imports from Ukraine. First, the period that has passed is simply too short. Second, there are inconsistencies in the data, as sectoral import data do not add up to total import data for some years. Third, the recent decrease and earlier increase in Dutch maize imports from Ukraine appears to be unrelated to the DCFTA. Finally, it should be noted that the volatility in year-on-year growth rates (while they correct to some degree for seasonality) is likely caused by the relative small flow of imports from Ukraine to the Netherlands, which makes the import data sensitive to large transactions.

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[13]   This appears to be the case both for data from Statistics Netherlands and data from Comtrade.
[14]   This large difference occurs because reported total Dutch imports from Ukraine for 2015 are €835 million, while the sum of the reported sectoral imports is €732 million. A similar inconsistency occurred for several earlier years (e.g., 2011, 2012, and 2014). For 2016 the data thus far appear to have been consistent.

4   Impact of the DCFTA on Trade and GDP

This chapter presents our estimation methodology and main results. We employ a global model of international trade to estimate the impact of the EU-Ukraine DCFTA on the Netherlands-Ukraine trade relation and Dutch real GDP. We estimate that the DCFTA is associated with 179% higher Dutch exports to Ukraine, and around 79% higher Dutch imports from Ukraine. Overall, the DCFTA will have a small but positive effect on Dutch real GDP.

4.1   The gravity model of international trade

We employ an internationally respected global trade model – the gravity model of international trade – to estimate the impact of the EU-Ukraine DCFTA on the Netherlands-Ukraine trade relation and on Dutch real GDP. The gravity model is a well-known model in the international trade literature and is often used to estimate the effects of existing or envisaged new trade policies (e.g. Anderson & Van Wincoop, 2003; Egger & Larch, 2011; Head & Mayer, 2014; Brakman et al., 2015).[15]

In its simplest form, the gravity model assumes that bilateral trade between two economies is proportional to the sizes of these economies (e.g., GDP) and inversely proportional to some notion of bilateral trade costs (e.g., distance). This strongly resembles Newton's Law of Universal Gravitation – hence the term 'gravity model'.[16] This simple specification has proven to be surprisingly successful in describing patterns in international trade. For this reason, Anderson (2011) even calls it one of the most successful models in economics. The exact specification may either be specified ad hoc or built upon microeconomic theory.[17] For further details on the gravity model, including model derivations, we refer to Anderson & Van Wincoop (2003), Larch & Yotov (2016) or Oomes et al. (2016).

Some features of the model are worth stressing here. First, the model delivers strong empirical performance in the sense that it typically fits the data quite well and delivers useful predictions. Second, if the model is built upon microeconomic theory, it can be validly employed to do policy experiments. This should strengthen the credibility of model predictions. Third, it is a global economy model, which implies that the model can make predictions for many countries. Another advantage of an appropriately specified gravity model is that it can take into account two important channels of trade: *trade creation* and *trade diversion*. Trade creation occurs when there is a decrease in trade costs between some country pairs (e.g., Ukraine and the Netherlands), which then encourages them to trade more with each other. However, this trade does not need to be completely new trade,

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[15]   A second type of model that is often used to assess the (predicted) impact of trade policies is the so-called Computable General Equilibrium (CGE) model. See e.g. Brakman et al. (2015) for a succinct comparison of both methodologies.

[16]   Newton's Law of Gravitation states that the (gravitational) attraction between two bodies is proportional to the product of their masses and inversely proportional to their distance squared. In our example here, one may think of 'GDP' as 'mass' and of 'trade costs' as 'distance squared'. In fact, the original gravity model due to Tinbergen (1962) used 'distance squared' as a proxy for trade costs. Employing distance as a proxy for trade costs is still common in the empirical literature.

[17]   Canonical in the latter respect is Anderson & Van Wincoop (2003).

but could be in part *diverted* to and from other trading partners (e.g., the Netherlands will export more to Ukraine, but will export less to other countries as a result). In order to predict the impact on total trade, it is important to take into account all trade creation and trade diversion effects. The gravity model is able to do this because it models all bilateral trading pairs of all countries.

4.2   Estimation of the gravity model

Using the gravity model, we can perform a 'trade policy experiment' to predict the impact of the EU-Ukraine DCFTA on the Netherlands-Ukraine trade relation and Dutch real GDP. Put succinctly, after determining the historical average effect of an FTA, we impose on the model that the EU and Ukraine have an FTA with an impact equal to this historical average effect. The gravity model then predicts how this affects trade creation, trade diversion, and the resulting impact on trade and GDP. This estimated state of the world should give an indication of the expected long-term effect of the DCFTA, should it be fully ratified and continue to be implemented.

We follow a step-by-step analysis based on Larch & Yotov (2016) and Oomes et al. (2016). Step by step, this entails the following.

1.   Using the gravity model, we first estimate the average historical effect of FTAs on bilateral trade. We do this for (nearly) all countries in the world, using information on 296 previous FTAs (see the next section for a description of the data). While estimating this average FTA effect, we control for several other variables that can affect trade between two countries: bilateral distance, whether two countries have a common border, whether they have a former colonial link, and whether they have a shared language. These variables are included as controls, but are also employed in our estimate of trade costs in steps 2 and 4 below.

2.   Using this estimate, we then calculate the implied bilateral trade costs between all countries. The gravity models assumes that trade is inversely proportional to trade costs, but we do not observe these trade costs as such. We therefore must model and estimate the trade costs. As is standard in the empirical trade literature, we model trade costs as a function of the variables mentioned above (presence of an FTA, common borders, former colonial links, and a shared language). In estimating these trade costs, we employ the regression estimates obtained in step 1 above.

3.   We impose the EU-Ukraine DCFTA. Thus far, the estimates obtained in step 1 and 2 are averages that do not yet take into account the existence of this specific DCFTA. We now alter our data to reflect the introduction of the EU-Ukraine DCFTA.

4.   We calculate the implied change in bilateral trade costs due to a EU-Ukraine DCFTA. We thus repeat the analysis of step 2, with the old regression estimates of step 1 but using the new data of step 3. This gives us a new estimate of bilateral trade costs for all DCFTA treaty partners.

5.   We calculate the implied change in bilateral trade resulting from the implied changes in bilateral trade costs. Our gravity model predicts for all countries by how much bilateral trade goes up

when bilateral trade costs go down. Given the results of steps 2 and 4, we can therefore estimate by how much bilateral trade increases for all country pairs, as a result of the DCFTA.

6. <u>We calculate the implied change in real GDP due to these implied changes in bilateral trade.</u> The estimated change in trade would theoretically imply a change in real GDP as well. Our model provides an estimate of this real GDP effects. Typically, the effect on real GDP will be much smaller than the estimated bilateral trade effect. For instance, suppose that due to an FTA a country starts exporting much more to the treaty partner. This is typically thought to increase real GDP. However, this country will typically also start to import much more from the treaty partner. This is typically thought to decrease real GDP. Furthermore, this is just the *trade creation* effect. If, as a result of the introduction of this FTA, the treaty countries start to trade less with non-treaty countries due to *trade diversion*, this may depress the overall effect on GDP of the FTA even further. Lastly, it may also be the case that, although the percentage increase in bilateral trade due to an FTA is large, it is small in absolute terms, particularly if the two countries did not trade that much before. The fact that real GDP would then be only be marginally affected, should therefore not be a surprise.

For more details on this methodology, we refer the interested reader again to Larch & Yotov (2016) and Oomes et al. (2016).

To model the average impact an FTA on trade (step 1), we are fortunate to be able to use the excellent FTA dataset developed by Brakman, Kohl, and Garretsen (2016) for 296 previous FTAs. This dataset does not only contain information on which countries concluded an FTA and when, but also on the 'depth' or 'extensiveness' of these shared FTAs. This FTA dataset is very useful as it allows us to take heterogeneity between FTAs into account. Based on extensive desk research, Brakman, Kohl, and Garretsen (2016) classified the contents of each FTA by scoring them on the presence or absence of 26 'provisions' (using a binary indicator, which is set to 0 if it the provision is not covered, and to 1 if it is covered). These provisions are similar to actual 'chapters' in an FTA dealing with e.g. Agriculture of Investments. We use this information by creating an FTA-index (FTAI) which computes the average share of the covered provisions in each FTA Because all provisions covered by Brakman, Kohl, and Garretsen (2016) are indicator variables between zero and one, our FTA index becomes a fraction between zero and twenty-six out of twenty-six. We use this index in our regression estimation of step 1, explained further below.[18]

In step 3 (adding the EU-Ukraine DCFTA to the dataset), we use this FTA index variable to reflect the FTA between the EU and Ukraine. Given the comprehensive nature of the EU-Ukraine DCFTA, we model the DCFTA as covering all 26 'provisions' in Brakman, Kohl, and Garretsen (2016), i.e., the trade agreement index between the EU and Ukraine is set to unity. This assumption is based on consultation with experts and our analysis of Emerson & Movchan (2016), which suggests that many Brakman, Kohl, and Garretsen (2016) provisions are covered directly and explicitly in the DCFTA (e.g. Agriculture, AD & CVM, SPS) while other provisions are embodied in other measures laid out in DCFT (for instance, the economic cooperation section of the DCFTA deals with labour and environmental laws). Should this assumption prove incorrect (e.g., should

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[18]   Appendix A reproduces Table A2 from Brakman, Kohl, and Garretsen (2016) to describe these 26 provisions that together constitute our FTA index variable. Additionally, this Appendix describes our data sources in general.

more detailed analysis reveal that 1 or 2 provisions are not covered in the DCFTA), then the estimated effects of the EU-Ukraine DCFTA may be smaller than reported in the next section. In any case, however, our estimates will reflect the estimated upper bound of the impact of the EU-Ukraine DCFTA. After all, under this assumption the impact reflected below is calculated under the 'most extensive FTA possible' in our dataset. Should this turn out to be an overly optimistic assumption, the effect of the EU-Ukraine DCFTA could be smaller, but not larger. Given the magnitude of our results below, we note the usefulness of this assumption.

4.3   Regression estimates

Table 4.1 presents the estimation results of a structural gravity model. We find that all things equal, FTAs – as measured by our Free Trade Agreement Index (FTAI) – are significantly positively associated with bilateral trade flows. Bilateral trade is furthermore found to increase in the presence of a common border, a former colonial link, or a shared language. Bilateral distance is found to decrease bilateral trade. These estimates are typical for the international trade literature, as is the high model fit ($R^2 = 0.87$).

The regression estimates reveal that, on average, all things equal, the maximum value of FTAI (FTAI = 1, all provisions are covered) is on average associated with a 136% increase in bilateral trade.[19] A common border, a former colonial link, and a shared language are found to increase bilateral trade by on average 58%, 41%, and 24%, respectively. On the other hand, trade is estimated to decrease with distance: it is on average 46% lower for each unit increase of the natural logarithm of distance.

Table 4.1   The maximum value of FTAI is associated with a 136% increase in bilateral trade

	Point estimate	Standard error	P-value
Parameters			
Free Trade Agreement Index (FTAI)	0.859	0.093	0.000
Common border	0.459	0.082	0.000
Former colonial link	0.347	0.091	0.000
Shared language	0.212	0.080	0.008
ln (distance)	-0.626	0.036	0.000
Model Fit			
R^2	0.87		
Pseudo log-likelihood	-9484.671		

Source: SEO Amsterdam Economics. Coefficients are obtained by a fixed effects PPML estimation of a standard gravity equation (see e.g. Larch & Yotov, 2016; Oomes et al., 2016). The dependent variable is bilateral exports. The trade agreement index is the average (arithmetic mean) of covered provisions in the FTA dataset of Kohl, Brakman & Garretsen (2016). Fixed effects are not reported. Number of parameters: 362; number of observations: 31,862; number of countries: 179; year: 2011.

We employ these estimates to assess the impact of the DCFTA on the Dutch economy. Recalling our procedure as laid out above, we first estimate trade costs (step 2), then impose the DCFTA

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[19] $\exp(\hat{\beta}) - 1$

(step 3), recalculate trade costs (step 4), and finally estimate the effects of the change in trade costs due to the DCFTA on bilateral trade and Dutch real GDP (steps 5, 6).

4.4   Estimated impact

We employ the methodology described above to estimate the effect of the EU-Ukraine DCFTA on Dutch exports, imports and GDP. The Main specification panel in Table 4.2 presents our main results and shows the total effect of the EU-Ukraine DCFTA. This total effect takes into account both direct and indirect effects. The agreement lowers trade costs and this increases bilateral trade. This is the *direct* effect, due to the fact that Ukraine gains a trade agreement with all EU countries and the costs of trading with all EU countries will decrease as a result. The *indirect* effect is that these changes in relative trade costs in turn could cause EU countries to trade less (or in some cases more) with each other, or with other third countries. Accounting for these changing patterns of trade (*trade diversion*) is important, and is taken into account in our estimates. The direct effect is equal to the regression estimate above (Table 4.1 above). The indirect effect may cause the total effect to be larger or smaller than this direct effect.

Table 4.2   Increases in total Dutch trade and GDP are positive but small.

	Main specification				Alternative specification[20]
	Prior to EU-Ukraine DCFTA (€ millions)	Estimate post EU-Ukraine DCFTA (€ millions)	Estimated change (€ millions)	Estimated change (%)	Estimated change (%)
Dutch exports to Ukraine[ac]	1 499	4 186	2 687	179%	170%
Dutch imports from Ukraine[ac]	749	1 343	594	79%	62%
Total Dutch exports[bc]	511 147	514 186	3 039	0.59%	0.19%
Total Dutch imports[bc]	456 643	458 645	2 002	0.44%	0.02%
Dutch *real* GDP[b]	650 787	650 964	177	0.03%	0.02%

Sources: SEO Amsterdam Economics; IMF Direction of Trade Statistics; IMF International Financial Statistics; IMF World Economic Outlook Statistics. [a] Base year is 2012. [b] Base year is 2015. [c] Exchange rate is 0.902. Unless otherwise indicated, all values reported are nominal euro's.

In our main specification, we estimate that Dutch real GDP is set to increase by an estimated 177 million euro's as a result of the DCFTA. This is much smaller than e.g. the estimated Dutch gain in bilateral trade with Ukraine or of the implied effects of the DCFTA on total Dutch trade. For instance, Dutch exports to Ukraine are estimated to increase by roughly 2.7 billion from roughly

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[20]   Zie ook verder AppendixB.

1.5 billion to roughly 4.2 billion. Dutch imports from Ukraine are set to grow from 0.7 to 1.3 billion – a 0.6 billion increase. As mentioned above, this disparity between these trade and GDP figures is due to the fact that some parts of changes in exports and imports cancel each other out and due to increases and/or decreases in trade with other countries. This is typical of the structural gravity model we employ.

Some remarks apply to these estimates. First, the choice of 'base year' is important for the estimated monetary magnitude of the effects of the DCFTA. Ordinarily, we would like to choose this base year as the year prior to the introduction of the (provisional) DCFTA, i.e.., 2015. This is also the most recent year for which we have complete data from IMF national accounts and our global trade databases. However, in the case of Ukraine, 2015 is an atypical base year due to the conflict in eastern Ukraine. Employing 2015 as a base year for Ukrainian trade could cause an underestimation of the monetary magnitude of the effect of the DCFTA. We choose to address this by employing 2012 as the base year for Dutch bilateral trade with Ukraine. For total Dutch trade and GDP figures on the other hand, we feel comfortable using the 2015 figures given that we have no reason to suppose that these figures are *substantially* in- or deflated.[21]

Second, we have modelled the DCFTA as the most extensive FTA possible in our dataset. The results presented above thus constitute an upper limit to the effect of the DCFTA. The true effect thus may be smaller, for instance if some provisions of the DCFTA end up not being ratified or implemented. To provide some insight into the sensitivity of our predictions in this dimension, we ad hoc make the DCFTA less comprehensive. If instead of 26 out of 26, 24 out of 26 provisions are assumed to be covered, GDP is still estimated to increase by roughly 0.03% (not reported in the table above). If instead of 26 out of 26, 16 out of 26 provisions are assumed to be covered by the DCFTA, we find that GDP is estimated to increase by roughly 0.02% (not reported above). Overall, it then seems that our main findings are fairly robust, at least in a qualitative sense, to a misspecification of the DCFTA in the model above.

Third, the robustness of the results reported in Table 4.2 crucially depend on the robustness of the estimates reported in Table 4.1. Appendix B presents some additional model specifications to probe for the robustness of the estimates reported in Table 4.1. By and large, we find that our parameter estimates are robust to different model specifications. This can be thought to strengthen the findings above. Additionally, given these different model specifications, we may also calculate the estimated effect of the DCFTA. We do this for one model and report the estimated percentage effects as an alternative specification in the table above, and also in Appendix B. We refer to the Appendix for additional details. We find that under a different specification, the estimated effects of the DCFTA are quantitatively smaller, but qualitatively similar. We for instance estimate that under a different specification the Dutch economy is set to gain 0.02% of real GDP from the EU-Ukraine DCFTA. This change of model specification does not alter our finding that the EU-Ukraine DCFTA is set to have a small, but positive impact on the Dutch economy.

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[21]   Bar Ukraine of course. However, the trade share of Ukraine in total Dutch trade is small (see sections above). We hence feel comfortable ignoring this issue.

5   Conclusions

While still awaiting final ratification by the Dutch parliament, the DCFTA between the EU and Ukraine has already been provisionally applied since January 2016.

Based on currently available export data through November 2016, it is too early to determine the exact impact of the DCFTA on Dutch exports. During the first 11 months of 2016, Dutch exports to Ukraine rose by 18%. However, it is not yet possible to attribute this substantial growth in exports (which was largely driven by machinery and food exports) to the DCFTA. It could also be simply a recovery from earlier drops in exports that occurred during the global financial crisis (2008/2009) and the recent unstable political situation in eastern Ukraine (2014/2015).

Similarly, it is too early to assess whether the DCFTA has already had any impact on Dutch imports from Ukraine. First, the period that has passed is simply too short. Second, there are inconsistencies in the data, as sectoral import data do not add up to total import data for some years. Third, the import data are affected to a large extent by a major increase and more recent decline in Dutch food imports from Ukraine, which appear to be unrelated to the DCFTA.

To estimate the impact that the DCFTA will eventually have on the Dutch economy, we consider it more reliable to make econometric predictions using a rigorous economic model, rather than looking at recent monthly statistics. We do this by employing a gravity model of international trade that incorporates both the direct effects (*trade creation)* and the indirect effects (*trade diversion*) that the DCFTA has on Dutch exports, imports and GDP.

Our key finding is that the EU-Ukraine DCFTA will have a positive impact on trade between the Netherlands and Ukraine, and would overall have a small positive impact on the Dutch economy. In our main specification, we estimate that Dutch exports to Ukraine will increase to roughly €4.2 billion, which is nearly a tripling compared to the level of annual exports before the political instability (€1.5 billion in 2012). Dutch imports from Ukraine are predicted to grow to €1.3 billion, which is nearly a doubling compared to the 2012 level of € 0.7 billion. Taking into account all direct and indirect effects on bilateral trade and trade with third countries, Dutch real GDP would increase by €177 million (0.03% of 2015 GDP) as a result of the DCFTA.

These predicted results require a cautious interpretation. First, the estimated coefficients are long-run predicted effects that would occur under stable economic conditions and the assumption that everything else remains equal. This may not hold for the EU-Ukraine trade relation. Second, we have not taken into account the legal enforceability of the provisions in the FTA. Third, as with any statistical estimate, there is some uncertainty surrounding the exact magnitude of the effect. Our robustness checks suggest that different model specifications yield results that are quantitatively slightly different, but qualitatively similar. Finally, this study is limited to the impact on trade and GDP and does not address any other positive or negative effects that the DCFTA may have on the Dutch economy.

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Appendix A   Data

We use bilateral trade data from the Direction of Trade Statistics (IMF, 2016).[22] We furthermore obtain bilateral covariates on distance, common borders, shared language, and colonial links from CEPIIs GeoDist dataset (Mayer & Zignago, 2011). These are standard data sources in the international trade literature.

As noted above, we employ the Brakman, Kohl, and Garretsen (2016) FTA dataset. The provisions covered by this dataset are described in Table below.

Table A.1   Provisions in FTA Dataset

Provision	Description
Agriculture	Agreement to liberalise trade in agricultural commodities by reducing/abolishing barriers to trade such as tariffs, quotas and subsidies. Agreement to harmonise agricultural policies may also be included. Undertakings may be in line with, deepen and/or broaden the scope of provisions specified in the GATT 1994/WTO Agriculture Agreement.
Anti-dumping and countervailing measures (AD and CVM)	Agreement with rules on anti-dumping and countervailing measures that specify the conditions under which parties may deviate from their liberalisation commitments to offset injury caused by dumping. Undertakings may be in line with, deepen and/or broaden the scope of provisions specified in the GATT 1994/WTO Agreement on Subsidies and Countervailing Measures (SCM Agreement).
Customs administration	Agreement to reduce administrative barriers to trade by simplifying customs administration with respect to issues such as import licensing requirements, valuation and nomenclature. Undertakings may be in line with, deepen and/or broaden the scope of provisions specified in the GATT 1994/WTO Agreement on Import Licensing Procedures.
Export restrictions	Agreement to liberalise duties, charges and/or quantitative restrictions on exported goods. Undertakings may be in line with, deepen and/or broaden the scope of provisions specified in the GATT 1994.

[22]   The countries in our sample are: Aruba, Afghanistan, Angola, Albania, Andorra, United Arab Emirates, Argentina, Armenia, Australia, Austria, Azerbaijan, Burundi, Belgium, Benin Burkina Faso, Bangladesh, Bulgaria, Bahrain, Bahamas, Bosnia and Herzegovina, Belarus, Belise, Bermuda, Bolivia, Brazil, Barbados, Brunei, Central African Republic, Canada, Switzerland, Chile, China, Cote d'Ivoire, Cameroon, Congo, Colombia, Comoros, Cabo Verde, Costa Rica, Cuba, Cyprus, Czech Republic, Germany, Dominica, Djibouti, Dominican Republic, Denmark, Algeria, Ecuador, Egypt, Spain, Estonia, Ethiopia, Finland, Fiji, France, Faroe Island, Gabon, United Kingdom, Georgia, Ghana, Guinea, Gambia, Guinea-Bissau, Equatorial Guinea, Greece, Grenada, Greenland, Guatemala, Guyana, Hong Kong, Honduras, Croatia, Haiti, Hungary, Indonesia, India, Ireland, Iran, Iraq, Iceland, Israel, Italy, Jamaica, Jordan, Japan, Kazakhstan, Kenya, Kyrgyzstan, Cambodia, Saint Kitts and Nevis, Republic of Korea, Kuwait, Laos, Lebanon, Liberia, Libya, Saint Lucia, Sri Lanka, Lithuania, Luxembourg, Latvia, Macao, Morocco, Moldova, Madagascar, Maldives, Mexico, Macedonia, Mali, Malta, Myanmar, Mongolia, Mozambique, Mauritania, Mauritius, Malawi, Malaysia, New Caledonia, Niger, Nigeria, Nicaragua, Netherlands, Norway, Nepal, New Zealand, Oman, Pakistan, Panama, Peru, Philippines, Papua New Guinea, Poland, People's Republic of Korea, Portugal, Paraguay, Qatar, Reunion, Russia, Rwanda, Saudi Arabia, Sudan, Senegal, Singapore, Solomon Islands, Sierra Leone, El Salvador, Somalia, Sao Tome and Principe, Suriname, Slovakia, Slovenia, Sweden Seychelles, Syrian Arab Republic, Chad, Togo, Thailand, Tajikistan, Turkmenistan, Tonga, Trinidad and Tobago, Tunisia, Turkey, Tanzania, Uganda, Ukraine, Uruguay, Uzbekistan, Saint Vincent and the Grenadines, Venezuela, Vietnam, Samoa, Yemen, South Africa, Zambia, Zimbabwe, United States of America.

Provision	Description
Import restrictions	Agreement to liberalise duties, charges and/or quantitative restrictions on imported goods. Undertakings may be in line with, deepen and/or broaden the scope of provisions specified in the GATT 1994.
Intellectual property rights	Agreement on the protection of IPR (copyrights, patents, trademarks, etc.) in foreign markets. Undertakings may be in line with, deepen and/or broaden the scope of provisions specified in the WTO Agreement on Trade-Related Aspects of IPR (TRIPS Agreement).
Investment	Agreement to prohibit discriminatory trade-related investment practices such as local content requirements, trade balancing requirements and foreign exchange restrictions. Undertakings may be in line with, deepen and/or broaden the scope of provisions specified in the WTO Agreement on Trade-Related Investment Measures (TRIMS).
Public procurement	Agreement to grant access to foreign parties and further liberalise the market for public procurement. Undertakings may be in line with, deepen and/or broaden the scope of provisions specified in the WTO Agreement on Government Procurement (GPA).
Sanitary and phytosanitary measures (SPS)	Agreement to simplify and/or harmonise import requirements with respect to food safety and animal and plant health. Undertakings may be in line with, deepen and/or broaden the scope of provisions specified in the WTO SPS Agreement.
Services	Agreement to liberalise trade in services. Undertakings may be in line with, deepen and/or broaden the scope of provisions specified in the General Agreement on Trade in Services (GATS).
State aid	Agreement to restrict any form of aid that could give rise to unfair competitive advantages. Undertakings may be in line with, deepen and/or broaden the scope of provisions specified in the GATT 1994/WTO Agreement on Subsidies and Countervailing Measures (SCM Agreement).
State trading enterprises (STE)	Agreements to ensure market access and non-discriminatory behaviour by governmental enterprises. Undertakings may be in line with, deepen and/or broaden the scope of provisions specified in the GATT 1994.
Technical barriers to trade (TBT)	Agreements to reduce barriers to trade by simplifying and harmonizing standards and technical barriers such as testing and certification procedures. Undertakings may be in line with, deepen and/or broaden the scope of provisions specified in the WTO Agreement on TBT.
Capital Mobility	Agreement to improve capital mobility by relaxing restrictions on foreign capital and facilitating cross-border financial transfers.
Competition	Agreements on competition policy to restrict or prohibit monopolies' activities to promote undistorted competition.
Environment	Agreement to uphold environmental laws, provided that they are not used as disguised barriers to trade. Commitments to enforce environmental laws so as not to attract (foreign) business activity that would exploit environmental resources.
Labour	Agreement to uphold labour laws so as not to attract (foreign) business activity that would exploit employees and/or to facilitate labour mobility.
Consultations	Signatories wishing to address issues arising from the implementation of the RTA, or their broader economic partnership in general, may engage in a diplomatic dialogue known as consultations "with a view to finding a mutually satisfactory solution".
	When specified, consultation procedures provide details on when and where consultations are to be held, which parties may attend, and the issues that may be addressed. In most cases, signatories must first attempt to solve disputes according to consultation procedures before having access to the RTA's dispute settlement mechanism.

Provision	Description
Definitions	By providing definitions of key concepts, signatories increase the clarity, scope and certainty of their commitments.
Dispute settlement	By agreeing on dispute settlement procedures, signatories reduce ambiguity and create a judicially binding mechanism that ensures the implementation of the RTA.
Duration & Termination	Signatories reduce ambiguity about their commitments by specifying the duration of the RTA and the means by which it can be terminated.
Evolutionary clause	Signatories commit themselves to a built-in periodic review mechanism that facilitates amendments and improvements to the original RTA.
Institutional framework	The signatories provide details on the institutional framework that will be used to oversee implementation.
Objectives	The signatories enhance the clarity and context of their commitments by specifying the objectives they envision by signing the RTA.
Plan & Schedule	The signatories commit themselves to a specific timetable by detailing the schedule according to which the RTA is to be implemented.
Transparency	The signatories commit themselves to creating greater institutional transparency, e.g., by agreeing on how and when information on economic policy will be shared.

Source: Brakman , Kohl & Garretsen (2016).

Appendix B   Robustness

In this appendix we briefly deal with the robustness of our results. As noted in the main text, the robustness of our findings hinges crucially on the robustness of our regression estimates (step 1). The table below probes for this robustness.

The specification reported in the main text is (1). Under (2) we probe for the stability of parameter estimates by including an additional explanatory variable; namely whether countries used to be the same country. We find that this parameter does not significantly explains patterns of bilateral trade. More importantly, the other parameter estimates appear to not be affected by the inclusion of this 'irrelevant' variable.

Table B.1   Robustness

		(1)	(2)	(3)	(4)
Parameters					
FTAI	Free trade agreement index	0.859**	0.857**	0.714**	
		(0.093)	(0.093)	(0.092)	
FTA	Presence of a free trade agreement				0.500**
					(0.068)
contig	Contiguous borders	0.459**	0.451**	0.493**	0.454**
		(0.082)	(0.089)	(0.074)	(0.087)
colony	Countries have had a colonial link	0.347**	0.346**		0.300**
		(0.091)	(0.092)		(0.097)
col45	Countries have had a colonial link after 1945			0.380	
				(0.207)	
comlang_ethno	Countries share a language	0.212**	0.209**		0.210**
		(0.080)	(0.080)		(0.080)
comlang_off	Countries officially share a language			0.047	
				(0.073)	
ln (dist)	Log of distance	-0.626**	-0.625**		-0.644**
		(0.036)	(0.035)		(0.036)
ln (distw)	Log of population weighted distance			-0.778**	
				(0.040)	
smctry	Countries used to be the same country		0.064		
			(0.148)		
Model Fit					
R^2		0.87	0.87	0.89	0.86
Pseudo log-likelihood		-9484.671	-9483.717	-9197.762	-9584.016

Source: SEO Amsterdam Economics. See notes at Table B.1 for additional information. ** and * denote significance at the 1 and 5 percent level respectively.

Specification (3) probes the robustness of the estimates with respect to the measurement of colonial linkages, shared languages, and distance. We reestimate the model with different

explanatory variables that should measure the same thing. We find that this does affect our parameter estimates, but not to an incredulous degree. However, given that the FTAI-estimate obtained under (3) is outside of the confidence interval of the FTAI-estimate obtained under (1), we deem it prudent to also report the impact on Dutch GDP of the DCFTA of the FTAI-estimate obtained under (3). In this case, we find a smaller impact of the DCFTA. Qualitatively however, our findings are unaltered: the DCFTA is estimated to have a small, but positive benefit for the Dutch economy.

Table B.2   Robustness II

	Prior to EU-Ukraine DCFTA (€ millions)	Estimate post EU-Ukraine DCFTA (€ millions)	Estimated change (€ millions)	Estimated change (%)
Dutch exports to Ukraine[ac]	1 499	4 053	2 554	170%
Dutch imports from Ukraine[ac]	749	1 214	465	62%
Total Dutch exports[bc]	511 147	512 116	969	0.19%
Total Dutch imports[bc]	456 643	456 728	84	0.02%
Dutch *real* GDP[b]	650 787	650 930	143	0.02%

Sources: SEO Amsterdam Economics; IMF Direction of Trade Statistics; IMF International Financial Statistics; IMF World Economic Outlook Statistics. [a] Base year is 2012. [b] Base year is 2015. [c] Exchange rate is 0.902. Unless otherwise indicated, all values reported are nominal euro's.

Specification (4) varies the measurement of FTAs. In our main specification we employ an index variable to measure not just the presence, but also the extensiveness of FTAs. Under (4) we just measure the presence of FTAs. Several things are worth noting. First, the point estimates of non-FTA variables are unaffected. Second, the coefficient on FTA under (4) is smaller than the coefficient on FTAI under (1). This implies that we would have estimated a smaller effect of the DCFTA had we measured FTAs differently. However, the specification under (4) also shows precisely why we chose to measure not just the presence, but also the contents of FTAs – the extensiveness of FTAs does matter.

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