

## ***The Estey***

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### **Trade Effects of the EU–Korea Free Trade Agreement: A Comparative Analysis of Expected and Observed Outcomes**

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Trade policy is being increasingly scrutinized by various stakeholders, and trade has become a contentious issue in the general public debate. Some observers claim that estimated positive impacts of free trade agreements (FTAs) are exaggerated and that effects of FTAs are rather more likely to be negative. But relatively few ex post assessments of EU FTAs have been carried out to shed light on the issue. Against this background, the present short article compares the economic assessment of the negotiated outcome of the EU–Korea FTA with observed data. Our results point to sound projections against observed data at the aggregate level and in the largest sectors, such as machinery, as opposed to trade in less important sectors.

Keywords: EU, ex post, FTA, Korea

#### **1. Introduction and Background**

**T**rade in general and free trade agreements (FTAs) in particular have received a significant dose of attention lately. While the most contentious issues seem to be the role of investor dispute settlement provisions or the perceived fear that FTAs may undermine democracy, some argue that the underlying studies analysing the economic impact of FTAs are wrong and that the effects of trade liberalisation will be negative rather than positive.<sup>1</sup>

Siles-Brügge (2015) further notes that while *ex ante* estimations of the benefits of FTAs have become routine exercises (irrespective of the type of model used and what the outcome is), *ex post* analyses are rare. He argues that the reason is that it is more important politically to show significant gains of FTAs before they are concluded compared to rigorously evaluating their impact after they enter into force.<sup>2</sup>

Generally speaking, the European Commission widely uses *ex post* evaluations to assess the extent to which EU action is achieving the set policy objectives and how performance can be improved in the future. The Commission's "Better Regulation" package provides key requirements that all evaluations should comply with.<sup>3</sup>

Nevertheless, relatively few *ex post* evaluations of EU FTAs have been carried out.<sup>4</sup> There are several data and methodological difficulties<sup>5</sup> associated with evaluating the impact of an FTA, but first and foremost, a sufficient time period is needed after entry into force of the agreement. The phasing in of tariff reductions is often stretched out, and one would like to have a certain period of time after full implementation – ideally a minimum of five years – before embarking on an *ex post* assessment of an FTA.

Over the past decade, the only commercially driven agreement that the EU has concluded, and which has entered into force, is the one with Korea (July 2011).<sup>6</sup> The FTA between the European Union and the Republic of Korea is the first of a new generation of FTAs, in addition to being the EU's first trade agreement with an Asian country.

As is customary with EU trade policy initiatives, the EU–Korea Free Trade Agreement is underpinned by rigorous economic, social, human rights, and environmental analysis – from the initial design stage (impact assessment), through the negotiations (sustainability impact assessment), and after the conclusion of negotiations (economic assessment of negotiated outcome). In addition, an *ex post* evaluation, launched in the summer of 2016, shall complete the policy assessment cycle.

This note compares the economic assessment of the negotiated outcome of the EU–Korea FTA, entitled "The Economic Impact of the Free Trade Agreement (FTA) between the European Union and Korea" (CEPII/ATLASS, 2010), with observed data. The CEPII/ATLASS report presents the economic assessment of the negotiated outcome with a quantitative analysis closely following the text of the agreement. Our comparative analysis thus exploits the CEPII/ATLASS study's trade effects, which are simulated against a baseline.<sup>7</sup> The projected trade effects are contrasted in this exercise with observed trade effects based on pre-implementation year trade figures as reference ("base year").

While the observed data reflects the impact of the EU–Korea FTA, it is also influenced by other factors unrelated to the provisions of the FTA. Nevertheless, trade figures in the EU–Korea context are often used to describe how the agreement works. Referring to an increase in EU exports to Korea of 55 percent since the agreement entered into force in 2011 when presenting its Annual Report on the Implementation of the EU–Korea Free Trade Agreement,<sup>8</sup> the Commission notes a “significant boost in trade thanks to the agreement”.<sup>9</sup>

The main contribution of this analysis is to improve our understanding of the precision of Computable General Equilibrium (CGE) models used to assess the impact of free trade agreements, such as the one used in the CEPII/ATLASS report, when measured against actual trade figures. We believe that most observers would look at the simple trade figures and draw similar types of conclusions, since trying to assess what counterfactual trade would have been, i.e., levels of EU–Korea trade in a situation when the agreement did not exist, is too complex.

The remainder of our comparative analysis is structured as follows. Section 2 addresses methodological questions, followed by section 3, which depicts the current state and evolution of aggregate bilateral trade patterns between the EU and Korea while also presenting results of the comparison exercise. Section 4 details developments of the EU’s export sectors against simulations, where section 5 presents respective trends and results for the EU’s import sectors. Section 6 concludes.

## **2. Methodology**

The present short note focuses on aggregate bilateral trade results and sectoral projections for the top product groups pertaining to EU–Korea bilateral trade. In that regard, interestingly, Korean exports to the EU are concentrated in fewer sectors (at the Harmonized System, or HS, section level) compared to EU exports. While the eight largest Korean export sectors amount to more than 95 percent of all EU imports from Korea, the top ten EU export sectors represent slightly more than 90 percent of total EU exports to Korea. Consequently, the EU export basket is more diversified compared to that of Korea. Given the relatively short period since the entry into force of the FTA between the European Union and Korea, the impact of the agreement on GDP, terms of trade, services trade, production, and employment is ignored.

In subsequent sections, tables and figures present the results of our comparative analysis by indicating observed trade values from the selected base year (2011) and the most recent year with available data (2015), as well as projected trade values for 2015 and 2026 in absolute terms based on the results of the CEPII/ATLASS modelling. Marginal trade effects in percentage terms are also included. Note that

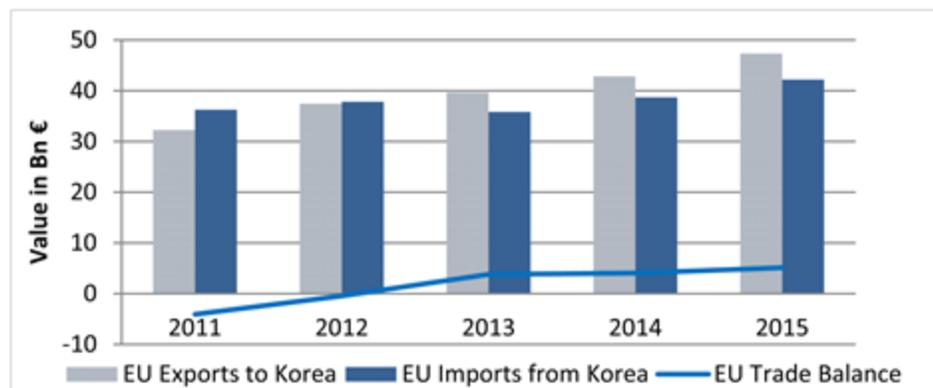
throughout our analysis, simulated increases in trade were assumed to evolve in a linear fashion. Given the frontloaded nature of the free trade agreement between the EU and Korea in terms of trade liberalization, such an assumption is justified for the sake of simplicity and analytical tractability.

In view of that, our chosen comparative metric – which divides observed trade values from 2015 by expected trade values for the same year – measures the precision of projections against observed data. In order to effectively compare results of the CEPII/ATLASS study with observed data however, the GTAP-based CEPII/ATLASS estimations were converted into projections corresponding to HS sections, as observed data is available in that nomenclature.

In addition, the calendar year 2011 was taken as the base year for calculating observed trade effects, even though the EU–Korea FTA has been provisionally applied since July 2011. Therefore, the effect of trade liberalization that materialized in 2011 is contained in base year figures. As a result, the presumably overvalued 2011 data would introduce a downward bias into observed trade effects.<sup>10</sup> As Lakatos and Nilsson (forthcoming) illustrated however, anticipatory effects of free trade agreements are present before negotiations are concluded and actual implementation of the particular FTA begins, thereby indicating the difficulties in isolating the impact of trade agreements when comparing observed data with pre-implementation figures.

### 3. Overall Trade

The evolution of aggregate trade flows between the European Union and Korea indicates a strengthening economic relationship, as expected given the FTA and in line with the CEPII/ATLASS study.



**Figure 1 Evolution of bilateral trade, 2011-2015 (billion €).**

Source: Comext.

As figure 1 indicates, EU exports to Korea have been steadily increasing, from €2.3 billion in 2011 to €7.3 billion in 2015. Compared to the expected 22 percent increase in EU exports by 2015 (corresponding to €9.4 billion in total absolute value), the observed figures outpaced the anticipated effect of the EU–Korea FTA (see table 1).

**Table 1** Observed Trade Effects Compared to Expectations in Absolute and Relative Terms

<b>EU exports to Korea</b>	32.3	47.3 (+47%)	39.4 (+22%)	<b>120</b>	58.9 (+83%)
<b>EU imports from Korea</b>	36.3	42.2 (+16%)	40.0 (+10%)	<b>106</b>	50.2 (+38%)

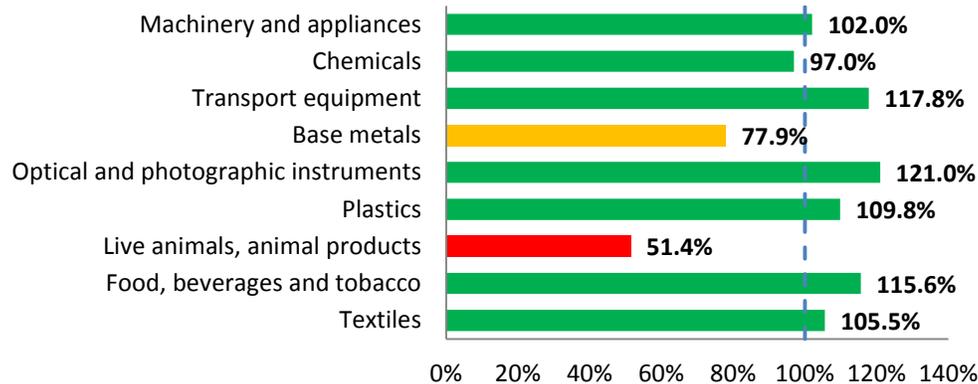
Source: Comext, CEPII/ATLASS, own calculations

Korean exports to the EU have also been on the rise, although with a one-time decline in 2013. From €6.3 billion in 2011, total EU imports from Korea increased to €2.2 billion in 2015, thus far matching expectations – at €4.0 billion – quite accurately. The bilateral trade balance of the EU with Korea improved by more than €1 billion from 2011 to 2015, representing a shift from a deficit of €4.0 billion in 2011 to a surplus of €5.1 billion in 2015. The magnitude of the observed EU trade balance improvement is considerably larger than expected.

#### 4. Sectoral Trade: EU Exports to Korea

In terms of sectoral exports from the EU to Korea, every product group has increased in value since the agreement entered into force in 2011 with the exception of base metals (HS XV). In line with expectations, the EU’s transport equipment (HS XVII) and machinery and appliances (HS XVI) sectors have benefitted significantly from the EU–Korea FTA so far, with mineral products (HS V) performing substantially better than projected. The anticipated growth in the live animals and animal products (HS I) sector on the other hand had not materialized by 2015.

The results of the comparison exercise for top EU export sectors are detailed below in order of significance according to base year shares from total European Union exports to Korea. Figure 2 quantifies and illustrates the sectoral developments. In addition, supplementary graphs are presented in the Technical Annex.



**Figure 2 Observed changes in EU exports to Korea compared to expectations, by sector.**

Source: Comext, CEPII/ATLASS, own calculations.

Note: Mineral products are excluded from the figure. The dashed, vertical line illustrates the point at which observed values match expectations.

The largest EU export sector, machinery and appliances (HS XVI), represents 30 percent of the EU's 2015 export basket to Korea. Although the share has declined since 2011, the value of exports increased from €1.7 billion to €4.2 billion over the 2011-2015 period. The observed trade effect (+21 percent) was slightly higher compared to the expected 19 percent increase in EU exports by 2015 (see table 2).

Product groups with substantial expected benefits from the free trade agreement between the European Union and Korea include the chemicals (HS VI) and the plastics (HS VII) sectors. Regarding trade in chemicals, a 23 percent predicted increase in European exports to Korea between 2011 and 2015 (+85 percent over 15 years of implementation) was matched by a 19 percent rise in observed EU chemical product exports during the same period. The corresponding absolute figures point to an expected increase of €1.1 billion in EU chemicals exports as compared to the observed rise of €0.9 billion, from €4.7 billion in 2011 to €5.6 billion in 2015.

According to the CEPII/ATLASS study, the EU's transport equipment (HS XVII) sector was expected to reap the most significant benefits from the EU–Korea FTA; a staggering increase of 90 percent was predicted by the fourth implementation year – 2015 – with total expected trade effects amounting to +339 percent by 2026. Observed data suggests that EU transport equipment exports more than doubled, from €4.5 billion in 2011 to €10.1 billion in 2015, outpacing expectations (at €8.5 billion in 2015) by over €1.5 billion. Moreover, the transport equipment sector overtook chemicals as the second largest product grouping in the EU's export basket according to share.

**Table 2** Observed Changes in EU Exports to Korea Compared to Expectations, by Sector (€ billion and %)

HS section	Observed data			Expectations				Comparison	Share
	Base year, 2011	Observed exports, 2015		Expected exports, by 2015		Expected exports, by 2026		Observed/expected value in 2015	Base year, 2011
	(€ <sup>a</sup> )	(€ <sup>a</sup> )	(Δ%) <sup>b</sup>	(€ <sup>a</sup> )	(Δ%) <sup>b</sup>	(€ <sup>a</sup> )	(Δ%) <sup>b</sup>	(%)	(%)
XVI. Machinery	11.7	14.2	21.3	13.9	18.9	19.9	70.9	<b>102.0</b>	36.2
VI. Chemicals	4.7	5.6	18.9	5.8	22.6	8.7	84.6	<b>97.0</b>	14.6
XVII. Transport e. <sup>c</sup>	4.5	10.1	124.3	8.5	90.4	19.7	339.2	<b>117.8</b>	13.9
XV. Base metals	2.8	2.6	-6.4	3.4	20.1	5.0	75.3	<b>77.9</b>	8.8
XVIII. Optical <sup>d</sup>	2.0	2.9	47.9	2.4	22.3	3.7	83.5	<b>121.0</b>	6.2
VII. Plastics	1.1	1.5	34.9	1.4	22.9	2.1	85.7	<b>109.8</b>	3.5
I. Live animals	0.7	0.9	19.8	1.7	132.8	4.4	498.0	<b>51.4</b>	2.3
IV. Food, bev, tob. <sup>e</sup>	0.7	1.0	49.9	0.9	29.7	1.5	111.3	<b>115.6</b>	2.2
XI. Textiles	0.7	1.0	45.0	1.0	37.4	1.7	140.2	<b>105.5</b>	2.2
V. Mineral prod. <sup>f</sup>	0.7	3.0	365.6	0.8	19.2	1.1	72.1	<b>390.5</b>	2.0

Source: Comext, CEPII/ATLASS, own calculations.

Note: (a) absolute figures; (b) values reflect marginal trade effects in relative terms compared to base year figures; (c) transport equipment; (d) optical and photographic instruments, etc.; (e) foodstuffs, beverages, tobacco; (f) mineral products.

With regard to the base metals (HS XV) sector, EU exports to Korea stood at €2.8 billion in 2011, representing the fourth largest sector according to share from total bilateral exports. Contrary to the expected 20 percent increase in EU exports of base metals however, the sector experienced a €0.2 billion (6 percent) decline by 2015, to an absolute value of €2.6 billion. Exceptionally across EU export sectors, observed data indicates sectoral contraction, whilst the CEPII/ATLASS projections simulated the expansion of EU base metals exports to Korea.

Concerning the optical and photographic instruments (HS XVIII) sector, expectations for EU exports to Korea – a 22 percent rise by 2015 and 84 percent by 2026 – were surpassed largely, as observed data reveals a 48 percent increase in European exports of optical and photographic instruments between 2011 and 2015. In absolute terms, Korean imports were projected to rise by €0.4 billion by 2015, while observed data shows an increase close to €1.0 billion, from €2.0 billion in 2011 to €2.9 billion in 2015. Indeed, the growth of EU exports of photographic instruments has so far been larger than expected.

European exports of plastics and rubber articles (HS VII) were predicted to rise to the same degree in relative terms as chemical products. Against a 23 percent expected increase of European exports of plastics products by 2015, the observed data suggests a 35 percent rise for the 2011-2015 period. In terms of absolute values, the expected rise corresponds to €0.3 billion while the observed increase translates into €0.4 billion, from the 2011 value of €1.1 billion to €1.5 billion in 2015. Given similar expectations, the divergence of trade patterns between the chemicals and the plastics sectors stems not only from different trade dynamics over the years, but also the distinct base year values. While chemicals represent the third largest EU export sector to Korea (12 percent share from total bilateral EU exports in 2015), the plastics and rubber articles product group is merely the seventh (3 percent share from the EU's export basket).

Additionally, European exporters of live animals and animal products (HS I) were expected to benefit considerably from the EU–Korea FTA, with an almost 500 percent predicted increase in EU exports to Korea over 15 years. However, it must be noted that EU live animals and animal product exports represent only a small share of total EU exports to Korea (less than 3 percent) partly explaining the high expected figures (CEPII/ ATCLASS, 2010). According to observed data, EU exports of live animals and animal products stood at €0.7 billion in 2011 and rose to €0.9 billion by 2015, representing more than €0.1 billion expansion. Therefore, the expected €1.0 billion increase by 2015 did not materialize.

EU exports of foodstuffs, beverages, and tobacco (HS IV) were projected to rise from the 2011 value of €0.7 billion to €0.9 billion in 2015 in absolute terms, corresponding to a 30 percent expected increase. According to observed data however, EU exports of food, beverages, and tobacco surpassed expectations, as European exports stood at €1.0 billion in 2015 (+50 percent).

Similarly to trade in transport equipment, although representing a much smaller share in total bilateral trade between the EU and Korea, the European textiles and textile articles (HS XI) sector was anticipated to gain significantly from the EU–Korea Free Trade Agreement. The CEPII/ATCLASS study predicted a 140 percent increase in European exports to Korea over 15 years of implementation – corresponding to a 37 percent rise in EU exports by 2015. Observed developments between 2011 and 2015 exceeded expectations, with European exports to Korea expanding by 45 percent. In absolute terms, EU textiles exports grew by €0.3 billion, from €0.7 billion in 2011 to €1.0 billion in 2015.

The stunning growth of EU exports of mineral products (HS V), from €0.7 billion in 2011 to €3.0 billion in 2015, merits further consideration, especially in light of more modest expectations for the sector. The nearly €2.4 billion rise in the 2011-2015

period can be explained by a substantial jump in EU mineral product exports in 2012 that tapered off in the subsequent years. The major drivers of such developments were increased EU exports of oils, oil preparations, and liquefied natural gas (HS product codes 270900, 271012, 271019, 271111), mainly from the North Sea (Su and Sheridan, 2012; Rascouet and Hurst, 2015).

As a result, the share of mineral products in the EU's export basket soared from 2 percent in 2011 to 6 percent in 2015. The volatility in oil prices during the relevant period is potentially an important consideration to bear in mind. A moderate reduction in oil prices in early 2012 was followed by a rebound and a subsequent sharp and enduring drop in 2014 (U.S. Energy Information Administration, 2016). According to the CEPII/ATLASS study, mineral product exports from the EU to Korea were predicted to moderately rise 19 percent by 2015, corresponding to a €0.1 billion increase in absolute values. Therefore, the observed evolution of the mineral products sector in light of the EU–Korea FTA is rather unanticipated and may not have been fully captured by the CEPII/ATLASS model.

## **5. Sectoral Trade: EU Imports from Korea**

In the aftermath of the EU–Korea Free Trade Agreement, the EU's trade relationship with Korea in terms of sectoral imports has been slightly more complex compared to exports. For most product groupings, EU imports have increased in value since the entry into force of the EU–Korea FTA in 2011. Korean exports of chemicals and plastics in particular have shown substantial increases in terms of value. On the other hand, some EU import sectors shrank in value in the 2011-2015 period, such as optical and photographic instruments and mineral products. Overall, observed trade effects against expectations for EU imports from Korea have so far been less clear-cut than in the case of EU exports, as illustrated in figure 3 as well as supplementary graphs in the Technical Annex. Below, developments in each sector are detailed in order of significance according to base year shares from total EU imports from Korea.

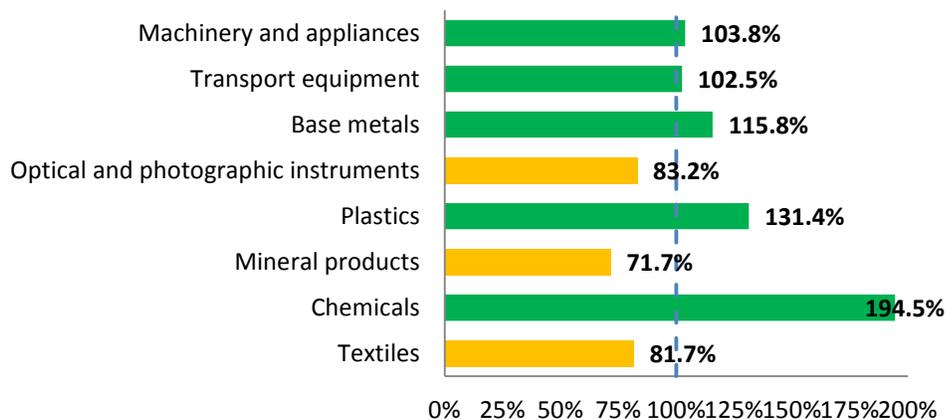
In addition to being the largest EU export sector according to share, machinery and appliances (HS XVI) also constitutes the biggest share of Korean exports to the EU. According to the CEPII/ATLASS study, EU imports were expected to rise by close to €0.3 billion from the 2011 base year figure (at €3.9 billion, see table 3). However, EU machinery and appliances imports from Korea have increased by €0.8 billion to an absolute value of €4.7 billion in 2015.

Exports from the Korean transport equipment (HS XVII) sector, a significant beneficiary of the EU–Korea FTA according to CEPII/ATLASS projections, have thus

far measured up to expectations. Observed data suggests that EU imports increased by €2.3 billion (+24 percent) in the 2011-2015 period, from €9.3 billion in 2011 to €11.6 billion in 2015. Comparably, transport equipment exports from Korea to the EU were estimated to rise by €2.0 billion (+21 percent) by 2015 and €7.5 billion (+80 percent) by 2026. Therefore, the hitherto evolution of trade patterns in the two largest EU import sectors (machinery and appliances, and transport equipment) shows significant gains since the entry into force of the agreement, and to a great extent matches expectations outlined in the CEPII/ATLASS study.

Observed data on imports of base metals (HS XV) from Korea to the EU indicates that European sectoral imports increased from €2.8 billion in 2011 to €3.3 billion in 2015, representing a marginal change of €0.5 billion (+19 percent). Such an increase is quite notable given the more moderate expected rise of 3 percent in Korean exports of base metals by 2015 (and over 9 percent by 2026).

European imports of optical and photographic instruments (HS XVIII) were expected to rise modestly in view of the EU–Korea Free Trade Agreement according to the CEPII/ATLASS study. The predicted 2 percent EU import rise by 2015 has not occurred; instead, Korean exports declined by €0.4 billion (-15 percent) in the 2011-2015 period.



**Figure 3 Observed changes in EU imports from Korea compared to expectations, by sector.**

Source: Comext, CEPII/ATLASS, own calculations.

Note: The dashed, vertical line illustrates the point at which observed values match expectations.

Similarly to optical instruments, EU imports of mineral products (HS V) were projected to increase moderately – by 8 percent in relative terms and by €0.2 billion in absolute terms by 2015. Yet, observed data show that Korean minerals exports dropped by more than €0.4 billion (-22 percent), from €2.0 billion in 2011 to €1.5

billion in 2015. As previously mentioned however, the peculiarities of the oil sector, including large price fluctuations, may not be fully captured in CGE models. Given the positive expectations for EU imports of minerals and optical instruments, it is worth noting that observed developments indicate the contraction of Korean exports in both sectors.

Sectors with more significant expected benefits to Korean exporters from the free trade agreement include the chemicals (HS VI) and plastics (HS VII) product groups. In relative terms, EU imports of both chemicals and plastics products were projected to increase by more than 17 percent by 2015 and over 65 percent by 2026. Naturally, the respective figures in absolute terms vary across the sectors due to different base year values. By 2015, EU imports of chemicals were estimated to rise by €0.2 billion, while the respective figure for Korean plastics exports was €0.4 billion. According to observed data however, Korean exports of chemicals more than doubled from €1.1 billion in 2011 to €2.5 billion in 2015, representing a larger than expected increase in EU imports. Similarly, plastics exports from Korea to the EU surged from €2.3 billion to €3.5 billion over the 2011-2015 period. Consequently, European plastics imports surpassed both optical instruments and base metals in terms of value in the Korean export basket to the EU.

According to the CEPII/ATLASS study, not only EU exports but also EU imports of textiles and textile articles (HS XI) were projected to rise considerably. In relative terms, Korean exporters were to benefit from a 49 percent rise in EU imports of textiles by 2015, corresponding to a €0.5 billion rise in absolute terms. Noting the 2011 base year value of Korean exports at just €1.0 billion, such estimates were not likely to be robust. Indeed, EU imports of textiles from Korea in 2015 amounted to €1.2 billion in contrast with the projected €1.5 billion.

Bilateral trade balance figures for each sector – signalling relative competitiveness – can be obtained by combining EU exports and imports data. EU sectors so far benefitting to the greatest extent from the EU–Korea FTA in terms of trade balance include Europe’s most important sectors, machinery and appliances, and transport equipment. During the 2011-2015 period, the EU’s trade balance in mineral products also improved significantly, from a deficit to a surplus, while the chemicals, plastics, and base metals sectors’ trade balance deteriorated from an EU perspective. Total trade<sup>11</sup> statistics show even more visibly the strengthening economic ties between the EU and Korea, as all main sectors expanded in terms of total trade value since the entry into force of the EU–Korea Free Trade Agreement (see the Technical Annex).

**Table 3** Observed Changes in EU Imports from Korea Compared to Expectations, by Sector (€billion and %)

HS Section	Observed data			Expectations				Comparison	Share
	Base year, 2011	Observed Imports, 2015		Expected Imports, by 2015		Expected Imports, by 2026		Observed/Expected value in 2015	Base year, 2011
	(€ <sup>a</sup> )	(€ <sup>a</sup> )	(Δ%) <sup>b</sup>	(€ <sup>a</sup> )	(Δ%) <sup>b</sup>	(€ <sup>a</sup> )	(Δ%) <sup>b</sup>	(%)	(%)
XVI. Machinery	13.9	14.7	5.8	14.2	1.9	14.9	7.1	<b>103.8</b>	38.3
XVII. Transport e. <sup>c</sup>	9.3	11.6	24.4	11.3	21.3	16.8	80.0	<b>102.5</b>	25.7
XV. Base metals	2.8	3.3	18.7	2.9	2.5	3.1	9.5	<b>115.8</b>	7.8
XVIII. Optical i. <sup>d</sup>	2.8	2.4	-14.8	2.8	2.4	3.0	9.0	<b>83.2</b>	7.6
VII. Plastics	2.3	3.5	54.4	2.7	17.5	3.8	65.5	<b>131.4</b>	6.3
V. Mineral prod. <sup>e</sup>	2.0	1.5	-22.3	2.2	8.4	2.6	31.3	<b>71.7</b>	5.5
VI. Chemicals	1.1	2.5	128.2	1.3	17.3	1.8	65.0	<b>194.5</b>	3.0
XI. Textiles	1.0	1.2	22.1	1.5	49.5	2.9	185.5	<b>81.7</b>	2.8

Source: Comext, CEPII/ATLASS, own calculations.

Note: (a) absolute figures; (b) values reflect marginal trade effects in relative terms compared to base year figures; (c) transport equipment; (d) optical and photographic instruments, etc.; (e) mineral products.

## 6. Conclusions

As the first of a new generation of free trade agreements, the EU–Korea FTA marked a new era in bilateral trade relations, and has contributed to the expansion of trade between the European Union and Korea largely in line with projections outlined in the economic assessment of the negotiated outcome of the agreement.

In 2015, the fourth implementation year, imports from Korea into the EU stood at €42.2 billion, consistent with the expected €40.0 billion. At the same time, EU exports to Korea were projected to reach €39.4 billion by 2015, yet observed figures at €47.3 billion indicate that the EU–Korea FTA generated greater than expected EU export growth. Sectoral results of the comparison exercise vary, with machinery and appliances (HS XVI) – the most important sector in the EU’s bilateral trade with Korea both in terms of exports and imports – so far exhibiting trade patterns approximately as expected.

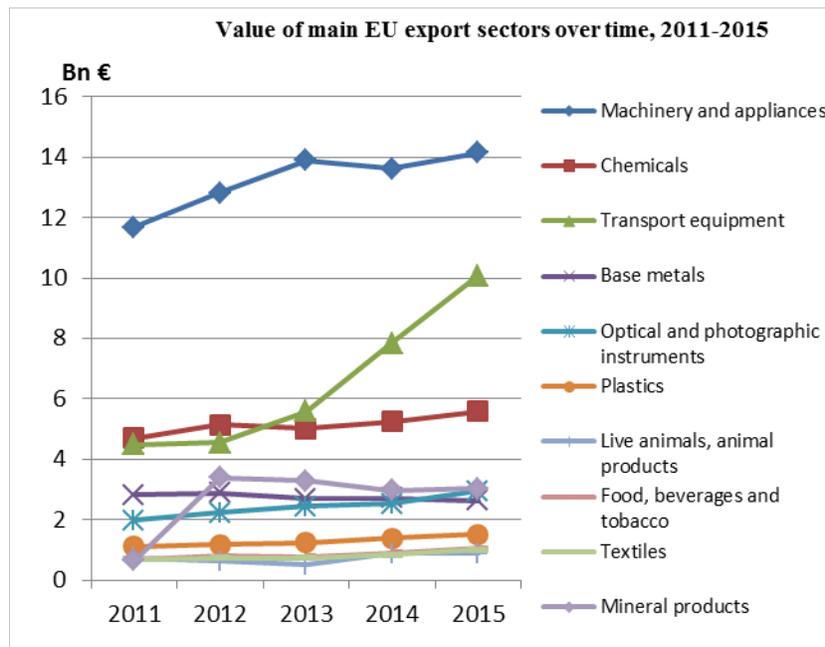
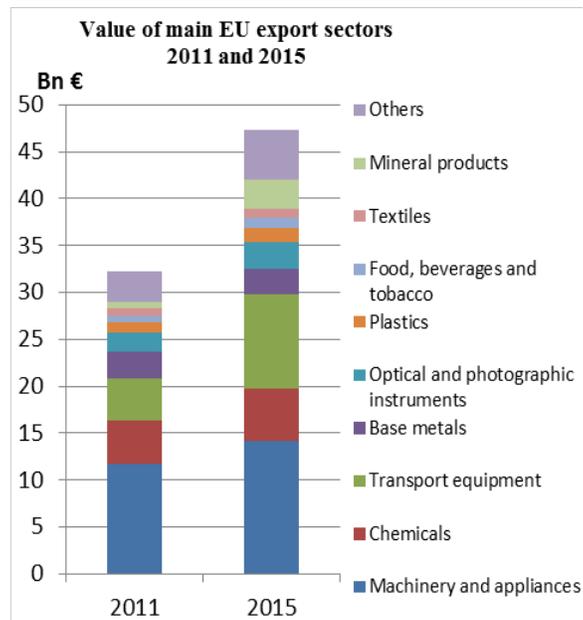
The present analysis adds to deliberations surrounding CGE modelling by examining the EU–Korea FTA and pointing to sound projections against observed data at the aggregate level and in the largest sectors. At the same time, modelling weaknesses are identified for smaller sectors as exemplified by mineral products.

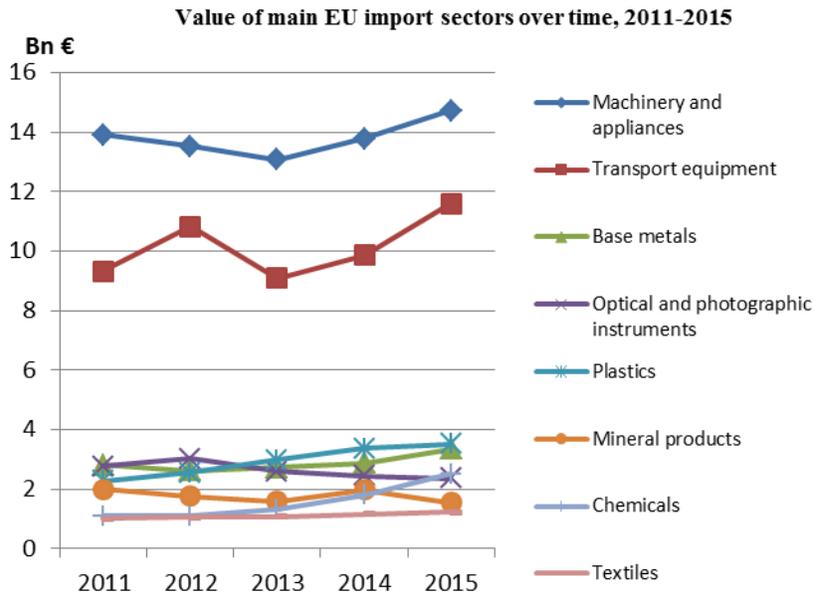
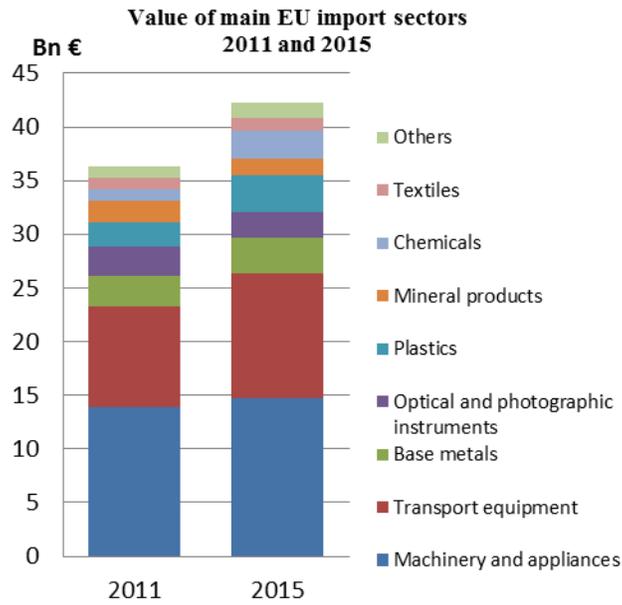
Going forward, as 2016 marks the fifth anniversary of the EU–Korea FTA’s entry into force, updating the present comparative exercise could improve further our understanding of the quality and precision of CGE models in the context of trade relations between the EU and Korea.

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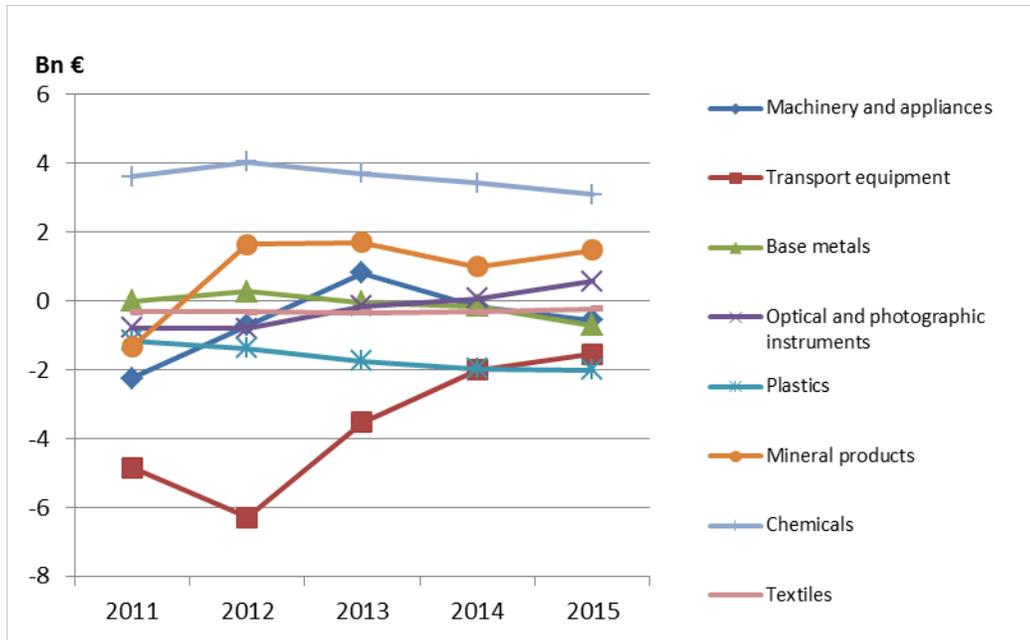
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## Technical Annex

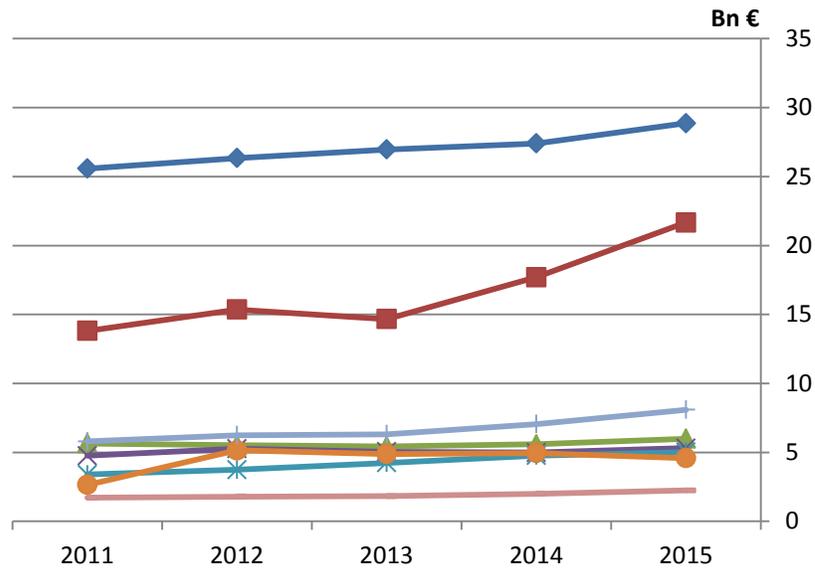




**Evolution of EU sectoral trade balance over time, 2011-2015**



**Total trade value by sectors over time, 2011-2015**



## Endnotes

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<sup>1</sup> See, e.g., Capaldo (2014).

<sup>2</sup> In fact, in the current debate, the same seems to hold true for some stakeholders as far as the political importance of showing significant losses of trade agreements before they are implemented is concerned.

<sup>3</sup> [http://ec.europa.eu/smart-regulation/guidelines/ug\\_chap6\\_en.htm](http://ec.europa.eu/smart-regulation/guidelines/ug_chap6_en.htm).

<sup>4</sup> ITAQA (2012) is one example.

<sup>5</sup> Ad valorem equivalents of some specific duties on goods, and in particular of services barriers, are difficult to estimate, and the reduction of these barriers that the agreement brings about is difficult to assess. A modern free trade agreement contains several other areas, the impacts of which are also difficult to quantify (intellectual property rights, geographical indications, public procurement, social and environmental impacts, etc.).

<sup>6</sup> The agreement with Canada is under ratification at the time of writing.

<sup>7</sup> The CEPII/ATLASS report (2010) modelled two baselines in order to simulate the evolution of bilateral trade between the partners in the absence of an agreement. Our chosen baseline assumes no conclusion of the WTO's Doha round, no additional FTAs between third parties and the EU or Korea, and increased protection levels in the Korean services sector, reflecting the fact that without the agreement Korea would have been able to increase protection in the services sectors, since the country's applied restrictions in the area are lower than the ones that Korea has bound in the General Agreement on Trade in Services (GATS).

<sup>8</sup> European Commission (2016).

<sup>9</sup> <http://trade.ec.europa.eu/doclib/press/index.cfm?id=1521>

<sup>10</sup> Observed trade effects are calculated as  $x_t/x_0$  where  $x_t$  represents a value from year  $t$  and  $x_0$  indicates the base year. When the effect of an FTA is partially captured in the base year value (presumably overstating the amount of trade had the agreement not entered into force), the observed trade effects will consequently be underestimated. Naturally, the error will carry through the comparison of observed and expected trade figures.

<sup>11</sup> Total trade is calculated by adding exports to imports.