

The EU Aid for Trade and its Impact on Trade Performance with Recipient Countries: A Disaggregated Assessment

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Abstract – This article presents an assessment of the impact of Aid for Trade (AFT) on commercial flows between the EU and recipient countries, through a gravity model. The originality of the article lies first in the high disaggregation level, by donor countries (the 22 EU countries members of the Development Aid Committee), by recipient countries (89 countries decomposed into five regions), by sectors (three sectors and 17 sub-sectors) and by AFT categories (national or institutional). Secondly, this article distinguishes between direct AFT effects and indirect effects which are conditional to the development level or the existence of a regional trade agreement with the EU. Finally, the econometric model uses the PPML estimator and three fixed-effects, as a means of properly addressing the problems related to zero observations, heteroskedasticity and endogeneity. Results show that AFT has limited but very contrasted effects across recipient countries, sectors and AFI categories. East Asia seems to be the region for which AFT is the most efficient, contrary to sub-Saharan Africa. Furthermore, the AFT dedicated to infrastructure has a greater impact on trade than other sectors (development of production capacity or aid for commercial policy regulation). Finally, institutional AFT seems also more efficient than national AFT. These results have important implications in terms of economic policies and AFT management.

JEL Classification

F13, F14, O19

Key-words

Aid for Trade
Gravity models
European Union

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INTRODUCTION

Official Development Assistance (ODA) is defined by the OECD through the Development Aid Committee (DAC). It is aimed at promoting economic development and improving standards of living in recipient countries. However, some developing countries, especially the Least Developed countries (LDCs) face numerous problems to integrate the world trading system, both at multilateral level (World Trade Organization, WTO) and at bilateral or regional level (Regional Trading Arrangements, RTAs). This is why the Aid for Trade (AFT) initiative has been initiated in 2005, during the first stages of the Doha Round negotiations, at the Hong Kong Ministerial Conference. The objective was to help developing countries to overcome structural problems related to trade and to open these countries to new trade opportunities (WTO, 2023).

Since then, about 150 billion US\$ have been dedicated to AFT. The UE is the main donor, since it accounts for 47% of world AFT, including both institutional (multilateral) AFT (from the EU own budget) and national aid, i.e. bilateral AFT by each Member State (European Commission, 2023). The AFT includes three main categories: Aid for Economic Infrastructure (transports, communication and energy), Aid for the development of production capacity (banking and financial services, business services, agriculture, forestry, fishing, industry, mining and tourism) and aid for policy and commercial regulation (multilateral negotiations, RTAs negotiations, trade facilitation, training and administrative management of trade policies).

The EU has developed its own strategy. In 2007, the initial objective was helping developing countries to integrate the world trading system as a means of reducing poverty (European Commission, 2024a). In 2017, this strategy has been revised so that AFT can also fit the sustainable development goals, as defined by the United Nations. In addition, the “Team Europe” initiative has been launched in order to coordinate the actions of the member states with the agencies in charge of AFT implementation and with Development Banks (European Commission, 2024b).

The assessment and the follow up of AFT is supervised notably by the WTO, which records trade flows, financial commitments by donor countries and recipient countries’ needs. In addition, the AFT world flows are collected in the Creditor Reporting System (CRS) database, managed by the OECD. Finally, the WTO implements Global Reviews in order to assess the results of the AFT which is implemented. These assessments are followed by a biennial joint publication WTO-OECD, entitled Aid for Trade at a Glance. The last publication (WTO-OECD, 2022) analyses the evolution of AFT flows in the context of crises. It shows that AFT was an important tool in the fight against the COVID-19 pandemic. It also highlights the role of AFT for addressing new challenges, such as environment and digital transitions, including green transition and women’s empowerment.

However, these publications do not provide a comprehensive assessment of the impact of AFT on trade performance. Given that the EU is the main provider of AFT, the question is to appraise to what extent the EU AFT is efficient to increase trade between the EU and the recipient countries. In this regard, the academic literature is incomplete. Most studies deal with the impact of world AFT, globally, for all donors without distinction (Brenton and Von Uexkull, 2009; Busse et al., 2012; Cali and Te Velde, 2011). In particular, very few articles are dedicated to the specific AFT granted by the EU (Kim, 2021; Hoekman and Shingal, 2024). The impact of AFT by

sectors is also largely under-explored (Vijil and Wagner, 2010 and Ferro et al., 2014) as well as the decomposition between institutional and national AFT (Hoekman and Shingal, 2024). The AFT impact by recipient countries or region is also under documented (Lemi, 2017; Tadesse et al., 2017, 2022). Finally, on a methodological point of view, many existing studies ignore recent progress in econometric technics, such as the use of the Poisson-Pseudo-Maximum Likelihood (PPML) estimator, recommended by Silva and Tenreyro (2006), which properly addresses the problem of trade flows equal to zero as well as heteroskedasticity, that are commonly found in gravity models. In the same way, endogeneity and multilateral resistance are frequent problems in gravity model which are not always correctly coped with.

The present study aims to bridge the gap of the literature with regard to the impact of AFT granted by the EU on trade with recipient countries, by proposing the following simultaneous contributions. First, it introduces the distinction between EU institutional and national AFT. Second, it provides a decomposition of for the three AFT categories (infrastructure, production capacity and trade regulation) and 17 subcategories. Simultaneously, the AFT impact is tested for 5 recipient regions (Sub-Saharan Africa, South and Central Asia, East Asia, Middle-East and North Africa) amounting to 89 countries. This makes it possible to get much more precise results, globally, by sectors and by regions. From an econometric standpoint, the model is estimated with the PPML estimator and uses 3 fixed effects (country-pair, importer-time, exporter-time) in order to account for multilateral resistance and endogeneity. A last but crucial innovation is the inclusion of two interaction terms, which show the conditions which must be filled to improve the impact of AFT on trade. For example, the presence of an RTA may enhance the trade impact of AFT since it provides a better market access. Similarly, the impact of AFT can depend on the development level of the recipient countries. This is why an AFT*RTA and AFT*GDP interaction terms are introduced.

The main results are the following. First the impact of AFT on trade flows is not always significant. Wide differences can be observed across countries, regions and type of flows (imports or exports). East Asia seems to be the region for which AFT is the most efficient to increase its trade flows. Infrastructure, especially transport is the sector for which AFT is also the most efficient. Contrasted results are found for production capacity with positive effects in some limited regions and sub-sectors (business services, agriculture, industry or tourism). No significant results are showed for commercial policy regulation.

Additionally, we show that AFT alone often fails to increase recipient countries' trade performance, while it proves to be more efficient when associated with an RTA with the EU or by a minimum economic development level. This means that AFT is more efficient when some initial conditions are filled. Furthermore, institutional AFT seems to be more trade-increasing than national aid. This may be explained by the fact that institutional AFT is more coordinated and covers a wider range of countries and sectors. Finally, we show that AFT is complementary with non-trade ODA for increasing trade flows.

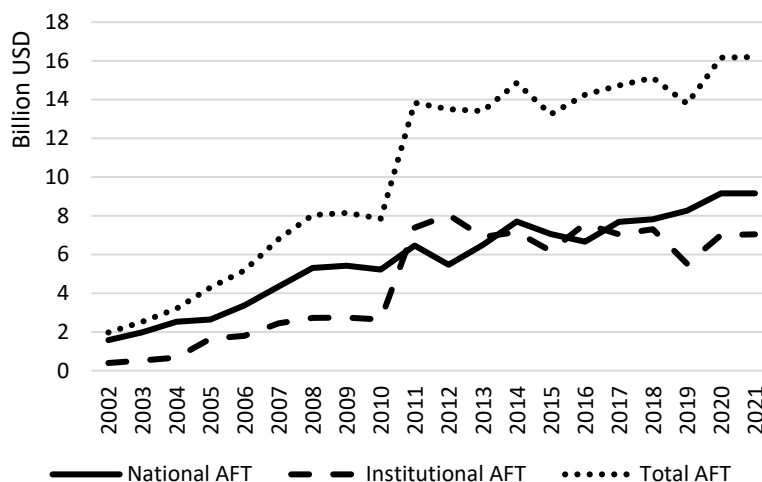
These results have important policy implications, since they question the efficiency of AFT and propose some solutions in terms of tracing, coordinating, controlling and assessing each project financed by AFT.

This article is organized in the following way. Section 1 presents some key figures about EU AFT and trade with the recipient countries. Section 2 provides a literature review on the trade impact of AFT. Section 3 develops the model and the econometric methodology. Section 4 shows and analyses the results of the estimations. The conclusion summarizes the main results and discusses their policy implications.

1. EU AID FOR TRADE AND TRADE PERFORMANCE OF RECIPIENT COUNTRIES: KEY FIGURES

This section provides key figures related to the development of AFT in the last two decades, in relation with trade flows with recipient countries. According to Figure 1, from 2001 to 2010, the institutional EU AFT has slowly increased and reached 2.6 billion US\$ at the end of this period. A significant surge occurred in 2011 (7.4 billion US \$). Since then, the EU AFT stabilized annually at 7.2 billion US\$, on average. This reflects a strong and stable commitment of the EU with regard to recipient countries. National commitment of the EU Member States also increased steadily and reached the all-time high level of 9.1 billion US\$ in 2021. Overall, the total AFT granted by the EU has been multiplied by 8 during the period, reaching 16.2 billion USD\$ in 2021. This suggests that both the EU and its Member States have increasingly responded to the needs of recipient countries with regard to AFT.

Figure 1. Aid for Trade granted by the EU (institutional) and by Member State (national) (2002-2021)



Source : OECD-CRS (2023).

Table 1 highlights the sectoral breakdown of AFT in 2002, 2012 and 2021. Economic infrastructure amounts to the greatest share of AFT, although this share declined over the period considered (37% of total AFT in 2021 instead on 55% in 2012). Conversely, the Development of Production Capacity reached 60% in 2021 (from 44% in 2011). This reflects a rebalancing of the AFT priorities in favour of economic activities (agriculture, mining, industry or services), whose production capacities are expected to stimulate trade. Finally, the Policy and commercial regulations represent a very small part of total AFT. In particular, the amount allocated to trade facilitation remains relatively small.

Table 1: Sectoral Breakdown of AFT: 2002, 2012 et 2021 (%)

	2002	2012	2021
Economic infrastructures	55	51	37
Development of production capacity	44	47	60
Policy and commercial regulations	1	2	2

Source : OECD-CRS (2023).

Looking at the geographical breakdown of the AFT granted by the EU (Figure 2a), it is worth mentioning that Asia consistently emerges as the leading recipient region, with its share slightly decreasing from 68% in 2002-2008 to 61% in 2016-2021. Africa follows as the second largest beneficiary. Europe, the Americas, and Oceania receive significantly smaller proportions of the AFT. On a yearly basis, figures may vary significantly. This denotes changes in priorities of the EU and needs of recipient countries, depending notably on the economic, social and political situation as well as regional crises. For example, the AFT is adjusted depending on GDP, industrial diversification, infrastructure, poverty, education, refugees inflows and political instability.

At country level, Figure 2b shows that main beneficiaries of EU AFT are India, Turkey, Vietnam, Indonesia and Bangladesh, which account for 38% of total AFT. Africa and Middle East countries come after with Iraq, Egypt and Morocco (12%). The other half of AFT is scattered in a large number of countries, mainly in Africa and Asia.

To sum up, it has been shown that AFT have strongly increased in the past 20 years, both at institutional and national level. Economic infrastructure remains the major AFT category but the share of AFT dedicated to production capacity is significantly rising. Asia and Africa remain the major recipients of EU AFT.

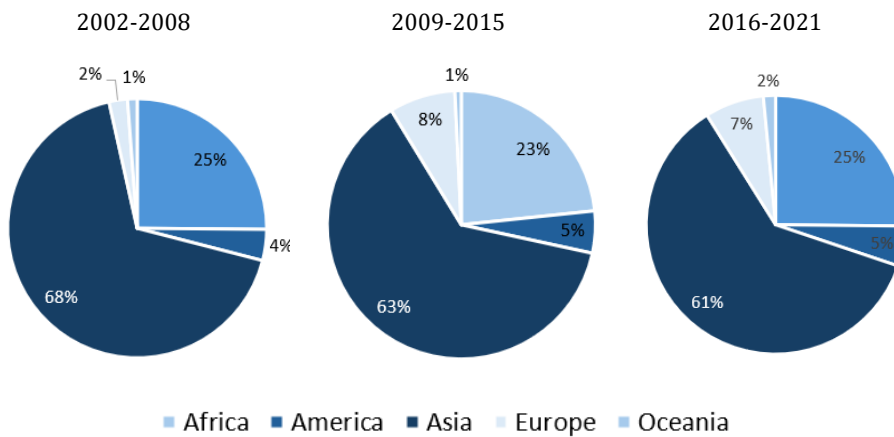
These figures can be related to trade between the EU and these regions in the past two decades. Figure 3 clearly shows the very strong rise in exports from Asia to the EU. This significant rise can be attributed to Asia's deepening integration into global supply chains and its strong export-oriented policies. Asian imports from the EU followed the same path though to a much lesser extent. Consequently, Asian countries experienced a strong and increasing trade surplus with the EU (ranging between 300 and 500 billions US\$ since the past decade).

African and American recipients increased both exports and imports in the first decade. However, trade with the EU tended to diminish in the second decade. Overall, the trade balance with the EU tended to decline in both regions, especially in Africa, which shifted from a 60 billion US\$ surplus in 2012 to a deficit in 2020.

One consequence of these trends is the strong increase of Asian recipients as major exporters to the EU, detrimentally to America and Africa. As a matter of facts, Asian recipient countries accounted to 63% of total exports to the EU in 2020 (from 47% in 2002), whereas the share of America declined from 13.8% to 9.6% during the same period, and the share of Africa halved (from 28% to 14%) (Table 2). Although the increasing export influence of Asia in the EU is well known and mainly explained by a very strong competitiveness of Asian countries, this result questions

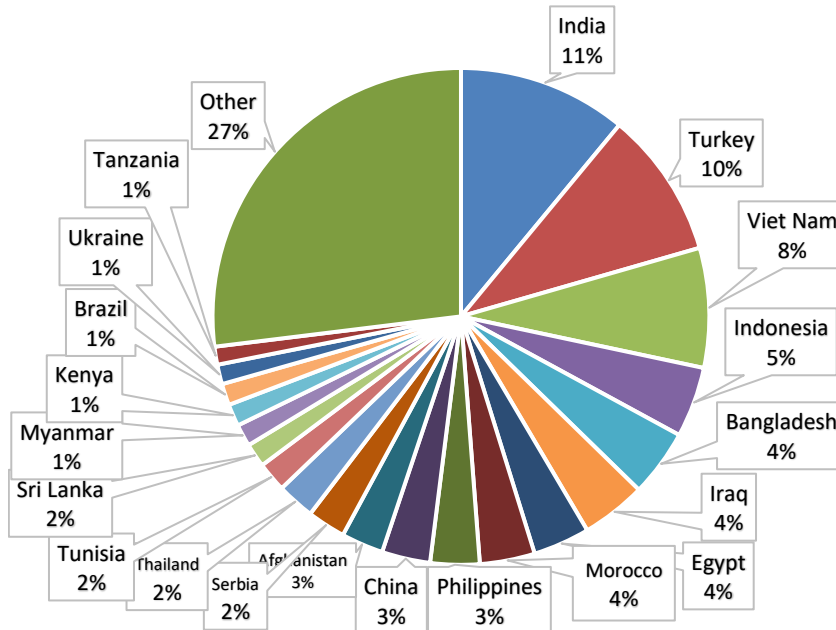
the figures related to AFT. Indeed, the increased amount of AFT granted by the EU has not prevented the trade decline of Africa and America with the EU, both in absolute terms (Figure 3) and relative terms (Table 2). Of course, AFT is not the only factor at stake: Crises, the rise in protectionism, exchange rates do play a significant role. Nevertheless, these results question the efficiency of AFT, especially in Africa. This is why the following sections aims to disentangle this question by isolating the specific impact of AFT on trade.

Figure 2a: Geographical Breakdown of the AFT granted by the EU



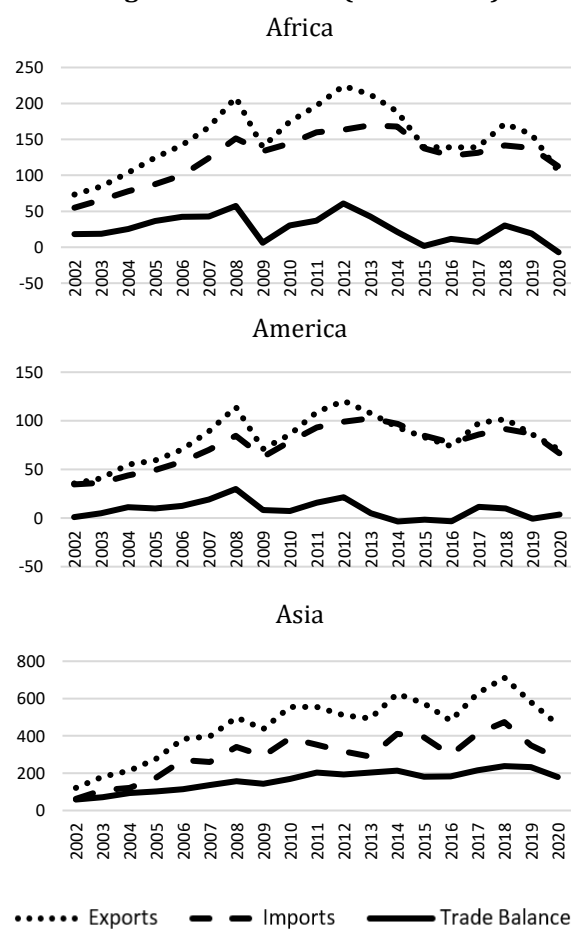
Source: OECD-CRS (2023).

Figure 2b: Top-20 Beneficiaries of EU Aid for Trade (2002-2021)



Source: OECD-CRS (2023).

Figure 3: Exports, Imports and trade balance of the main recipient regions with the EU (billion USD)



Source: CEPII (2023).

Table 2: Share of regional exports to the EU from AFT beneficiaries (%)

	2002	2012	2020
Africa	28,4	23,5	14,5
Asia	47,1	53,4	63,5
Americas	13,8	12,6	9,7
Europe	10,4	10,3	12,1
Oceania	0,3	0,2	0,2

Source: CEPII (2023) and World Bank (World Development Indicators: Merchandise exports in current US\$).

2. THE LITERATURE REVIEW

Since the past decade, the efficiency of AFT has been widely explored in the literature, though in an incomplete way. The first studies have been published since the end 2000s, taking overall AFT granted by the North to Southern countries (Brenton and Von Uexkull, 2009, Busse et al., 2012). They use standard gravity models to test the impact of AFT on trade flows and associated costs. They show positive effects of AFT in recipient countries' export performance, through the reduction of transaction costs.

The sectoral impact of AFT have been explored by Cali and Te Velde (2011), which use GMM and fixed effects in gravity models. Results generally show positive trade effects of AFT. However, these effects are stronger for some AFT categories, such as trade facilitation, but limited for other categories, such as production capacity. Helble et al. (2012) also find differentiated effects across sectors. Vijil and Wagner (2010) go further by exploring transmission channels. They show that AFT for infrastructure is a crucial determinant for exports through its impact on export capacities. The bidirectional effect of AFT is also tested by several authors. For example, AFT is more efficient to increase exports of recipient countries than their imports (Hühne et al., 2014, Pettersson and Johansson, 2013).

Overall, all these studies tend to highlight a positive impact of AFT with differentiated effects across sectors and types of trade flows (exports and imports). They also suggest contrasted effects depending on certain conditions in recipient countries, e.g. in terms of infrastructure. However, these studies present some limits, both because they rely on standard econometric methods and because of their limited scope.

From an econometric point of view, more recent articles propose new methods to cope with endogeneity. For instance, Ghimire et al. (2016) use the System-GMM estimator to test the impact of AFT on developing countries' export performance. Similarly, Martínez-Zarzoso et al. (2017) use quantile regression technics. They show that AFT increases exports of recipient countries mainly beyond the 35th quantile of the conditional export distribution. The AFT impact also varies across sectors, with effects of infrastructures limited to inferior quantiles and effects on production capacities efficient for almost all quantiles.

The choice of the appropriate estimator is crucial for unbiased results. In this regard, the PPML estimator, recommended by Silva and Tenreyro (2006), has recently become essential in gravity model estimations. The main advantage of this estimator is that it correctly accounts for zero observations and heteroskedasticity while offering more reliable estimations than other estimators. It has been used only recently to test the impact of AFT (Kim, 2021 and Hoekman and Shingal, 2020, 2024).

The use of three fixed-effects (bilateral, importer-time and exporter-time) is also a key improvement, as shown by Weidner and Zylkin (2021). This method is particularly appropriate to cope with unobserved heterogeneity and multilateral resistance. It significantly improves the robustness of the estimations. However, to our knowledge, it has been applied to AFD only by Kim (2021) and Hoekman and Shingal (2020, 2024).

The scope of AFT studies has also been recently enlarged in the literature. In particular, regional analysis progressively appeared, with a breakdown through recipient and donor countries. Another distinction is made between multilateral (institutional) and bilateral (national) AFT. For example, Tadesse et al. (2017) find that both bilateral and multilateral AFT enhance recipient countries' trade in Africa, Asia, America and Europe. However, multilateral AFT is often more efficient given a better coordination across countries and a larger country coverage. In a subsequent study, Tadesse et al. (2022) focus on Africa and find that bilateral and multilateral AFT significantly reduce trade costs in all African sub-regions, especially through AFT in infrastructure.

Turning to Asia, Mowlaei (2017) shows positive effects of AFT in Asian countries, through reforms of trade policies. Lee and Oh (2022) reveal that AFT is particularly efficient for the trade and policy regulation category in transition economies, especially Mekong areas.

The distinction between donor countries has also been recently explored. For example, Kim (2021) underlines that the AFT granted by the UE increases recipient countries trade, particularly exports, even if these countries do not have RTAs with the EU. Hoekman and Singhal (2024) show that bilateral EU AFT increases the recipient countries' imports, whereas institutional (multilateral) AFT is more efficient for recipient countries exports. This difference may be due to the fact that EU countries could grant AFT to increase their market access to recipient countries, while EU institutional AFT could be provided so as to improve recipient countries' development through their export performance. Whatever the reason, these results show the complexity of AFT dynamics with the duality between strategic interest of member states on the one hand and development objectives of institutions on the other hand.

To conclude this section, it has been shown that overall, the AFT is efficient to increase trade between the donor and the recipient countries. However, the results are contrasted depending on the AFT category (sector), the type of flows (exports or imports), the region considered (both on the donor and on the recipient side) and the type of AFT (institutional or national). In addition, it can be expected that AFT may also be sensitive to initial conditions. For example, the efficiency of AFT may depend on the existence of RTAs between donors and recipient countries. Indeed, an RTA could reinforce the efficiency of AFT since some initial trade conditions are implemented through the RTA. Similarly, it can be expected that the AFT impact depends on the development level of the recipient country. This can be explained by the fact that the conditions for AFT to be efficient are not the same whatever the development level of the recipient countries. However, these conditions remain unexplored in the existing literature.

The present study proposes to test the efficiency of the AFT granted by the main donor countries (the EU) to 89 recipient countries. It aims to include and extend the various contributions of the recent literature by simultaneously including sectoral and sub-sectoral analysis, national and institutional AFT, imports and exports and sub-regional areas. It also tests two initial conditions: the presence of RTAs and the development stage of recipient countries. It finally compares the trade effects of AFT with non-trade ODA. From an econometric point of view, it uses the PPML estimator and 3 fixed-effects in order to provide a more reliable estimator.

3. MODEL SPECIFICATION

The model proposed here relies on new developments in gravity model. It first includes multilateral resistance, as developed by Anderson and van Wincoop (2003). In addition, following Baier and Bergstrand (2007), country-pair fixed effects are introduced together with the PPML estimator proposed by Silva & Teneyro (2006). This estimator properly addresses the problem of trade flows equal to zero as well as heteroskedasticity, which are commonly found in gravity models.

The problem of endogeneity related to AFT is addressed by including both country pair fixed effects but also exporter-time and importer-time fixed effects in order to control unobserved factors which may influence trade flows and multilateral resistance (Weidner et Zylkin, 2021). Time-lag is also considered in the AFT variable, since the impact of AFT on trade is not immediate, as also suggested in Cali and Te Velde (2011). Thus, AFT is lagged by one year in our model. Indeed, after having tested for other lags (two and three years), it is observed that the most important effects of AFT comes after one year.

Another aspect of the model is that we consider both AFT provided by each EU Member State (national assistance) and institutional AFT (provided by the EU institutions). This raises an additional problem in gravity models, which are based on country trade flows only. Thus, following Hoekman & Shingal (2024), institutional AFT by country has been calculated by using the share of each member state in the overall EU budget.

Several sensitivity and robustness tests are performed. First, a multidirectional cluster has been used in order to estimate standard deviations by donor, recipient, time and AFT categories. This makes it possible to improve the precision of the estimator by capturing intra-group correlations, as shown in Egger and Tarlea (2015). Second, the model has been re-estimated by excluding zero trade observations, as in (Larson et al., 2018).

The final model is the following:

$$\begin{aligned}
 T_{ijkt} = \exp & (\beta_0 + \beta_1 \ln(AFT_{jik,t-1}) + \beta_2 \ln(NTODA_{ik,t-1}) + \beta_3 RTA_{ijk,t} \\
 & + \beta_4 \ln(AFT_{jik,t-1}) \times RTA_{ijk,t} + \beta_5 \ln(AFT_{jik,t-1}) \times PCGDP_{i,t}) \\
 & + \delta_{i,t} + \gamma_{j,t} + \alpha_{ij} + \varepsilon_{ijkt}
 \end{aligned}$$

where:

- T_{ijkt} denotes trade flows (exports or imports) between the recipient country i and the donor j , in the subregion k (East Asia, Middle-East, North Africa, South and Central Asia and sub-Saharan Africa), at year t
- $\ln AFT_{jik,t-1}$ represents the log of aid for trade, lagged by one year.
- $\ln NTODA_{ik,t-1}$ reflects lagged non-trade ODA, i.e. total ODA minus AFT
- $RTA_{ijk,t}$ corresponds to the existence of an RTA (dummy variable) between the donor and the recipient country.
- $\ln(AFT_{jik,t-1}) \times RTA_{ijk,t}$ is an interaction term between AFT and RTA. It shows how the impact of AFT can be modified by the existence of an RTA between the donor and the recipient country.

- $\ln(AFT_{jik,t-1}) \times PCGDP_{i,t}$ is an interaction term between AFT and per capita GDP in country i. It shows how the trade impact of AFT may depend on the development level of the recipient country.
- $\delta_{i,t}, \gamma_{j,t}, \alpha_{ij}, \varepsilon_{ijkt}$ are respectively exporter-time, importer-time and country-pair fixed effects as well as an error term.

It is worth mentioning that the total effect of AFT is given by the sum of the direct effect (β_1) and the conditional (interaction) effects (β_4 and β_5):

$$\frac{\partial \ln(T_{ijkt})}{\partial \ln(AFT_{jik,t-1})} = \beta_1 + (\beta_4) \cdot RTA_{ijk,t} + \beta_5 \cdot PCGDP_{i,t}$$

Data sources are the followings. Trade flows are derived from the CEPII trade flows database. They are measured in thousand US dollars. Aid for trade and non-trade ODA come from the OECD database (Development Finance Data). In this regard, several AFT categories and sub-categories are specified: Aid for Economic Infrastructure (INFRA_ECO), decomposed by transports, communication and energy; Aid for the development of production capacity (PROD_CAP), with banking and financial services, business services, agriculture, forestry, fishing, industries, mining and tourism as sub-categories; and finally aid for policy and commercial regulation (POL_REG), with multilateral negotiations, RTAs negotiations, trade facilitation, training and administrative management of trade policies as sub-categories. Dummy data for RTA are derived from NSF-Kellogg Institute, 2023. Finally, per capita GDP is collected from the CEPII gravity database (CEPII, 2023).

The model has been estimated for the 89 recipient countries which are granted AFT through the OECD DAC. These countries include 5 sub-regions, of which Sub-Saharan Africa (49 countries), South and Central Asia (17 countries), East Asia (11 countries), Middle-East (7 countries) and North Africa (5 countries). Donor countries involve the 22 EU countries which are members of the DAC¹. The period considered ranges from 2002 to 2020. Data corresponding to AFT are taken both by sector and by sub-sector, as described above. Estimations are implemented for AFT impact on trade of goods only.

4. ESTIMATION RESULTS

Tables 3 and 4 show that AFT has limited and mixed effects on recipient countries' trade². As a matter of facts, there are strong differences across regions, sectors and sub-sectors. Results also depend on initial economic conditions, mainly the presence of RTAs. Overall, as mentioned previously, the total marginal effect of AFT is the sum of the direct effect and the conditional effects related to RTA and GDP per capita.

¹ We consider the dynamic composition of the EU, i.e. its various enlargements, in order to better account for the representativity of the AFT effects on trade through structural changes in the EU.

² Given the high disaggregation level and in order to save space, Results in the Tables and Annexes present only the most important variables related to AFT. The variable related to RTA has not been presented, though included in the estimation procedure. Complete results are available on request.

Table 3: The impact of AFT for exports, by regions and sectors

	East Asia	Middle-East	North Africa	Central and South Asia	Sub-Saharan Africa
INFRA_ECO _{ij}	0.199*** (2.58)	1.721* (1.68)	0.0474 (0.59)	-0.550* (-2.26)	-0.0431 (-0.48)
PROD_CAP _{ij}	-0.225 (-1.03)	-0.765 (-0.92)	0.167 (1.02)	0.392 (1.47)	-0.0301 (-0.29)
POL_REG _{ij}	-3.222*** (-2.60)	3.057 (1.10)	0.278 (1.40)	0.655 (0.71)	-0.427 (-1.35)
INFRA_ECO _{ij} * RTA _{ijt}	-0.141*** (-2.78)	-0.937 (-3.16)	0.343*** (3.61)	0.553** (2.24)	0.0992 (0.97)
INFRA_ECO _{ij} (t-1) * PCGDP _{it}	-0.0386 (-1.30)	-0.858 (-1.39)	-0.0688 (-1.03)	0.0716 (0.76)	0.176*** (4.56)
PROD_CAP _{ij} * RTA _{ijt}	0.215** (2.24)	0 (.)	-0.152 (-1.27)	-0.380 (-1.42)	0.140 (0.65)
PROD_CAP _{ij} * PCGDP _{it}	0.0166 (0.18)	0.452 (0.87)	-0.168 (-1.16)	0.0166 (0.23)	-0.00335 (-0.05)
POL_REG _{ij} * RTA _{ijt}	3.081*** (2.66)	0 (.)	0 (.)	-0.671 (-0.62)	0.399 (1.11)
POL_REG _{ij} * PCGDP _{it}	0.359 (1.18)	-2.378 (-1.27)	-0.409* (-1.71)	-0.224 (-0.31)	0.0913 (0.43)
Constant	16.45*** (438.14)	13.12*** (78.70)	15.02*** (280.66)	14.94*** (65.61)	13.79*** (201.01)
<i>Observations</i>	2267	1316	1320	4594	12358
<i>Log-likelihood</i>	-12337953.2	-14102537.5	-18054426.7	-35373823.3	-108709661.0
<i>Pseudo R²</i>	0.999	0.976	0.988	0.987	0.960

Note: For variables that do not display a coefficient or standard error, this indicates that these variables have been absorbed by the fixed effects. In our model, fixed effects for exporter-time (it), importer-time (jt), and exporter-importer (ij) have been included, which means that any variable that does not exhibit variations beyond these fixed effects is fully captured by them. As a result, these variables do not have an individual coefficient or standard error reported in the table.

Table 3 displays results for exports, with a breakdown by regions and sectors³. It shows that AFT in economic infrastructure is directly efficient to increase exports of East-Asia and Middle-East to a lesser extent, whereas no significant effects are observed for the other regions. However, when AFT is associated with the presence of RTAs, it has also positive effects for North Africa and also Central and South Asia. This reveals that when these countries implement an RTA with the EU, initial conditions are more favourable for trade, which makes the AFT more efficient. It is also interesting to observe that AFT has no impact for Sub-Saharan African exports, except for the most developed ones, as suggested by the positive GDP interaction term. This suggests that the least developed African countries do not take advantage of AFT, for various reasons (misallocation of the AFT and default of appropriate initial conditions, such as a minimum economic development)⁴.

³ Although all zero trade flows are considered, the total number of observations vary because fixed-effects may absorb some unvarying country-pair or time data.

⁴ Unexpectedly, the direct effect of AFT for infrastructure is negative for Central and South Asia. This can be explained by specific characteristics of this region. Nevertheless, this negative direct effect is balanced by a positive conditional effect due to RTA. Overall, the total impact of AFT in these countries is thus insignificant. Identically, the negative direct effect for policy regulation in East Asia is balanced by a positive conditional effect of similar magnitude due to RTA.

Looking at sub-categories of infrastructure, Annex 1 shows that the most significant impact involves energy in North Africa, transports in East-Asia (when associated with RTA) as well as communications in Middle East and Sub-Saharan Africa (when associated with RTA and also economic development for the latter). Turning to AFT dedicated to the reinforcement of production capacities, Annex 1 indicates no significant impact, except for specific sectors and regions, such as industry in the Middle-East and Finance in Central and South Asia. However, when associated with an RTA, the export impact of AFT becomes also significant for agriculture in the Middle-East. With regard to commercial policy regulation, most effects are insignificant.

Table 4: the impact of AFT for imports, by region and sectors

	East Asia	Middle-East	North Africa	Central and South Asia	Sub-Saharan Africa
INFRA_ECO _{ji}	0.211** (2.01)	0.693*** (2.94)	-0.0506 (-0.78)	-0.104 (-0.83)	-0.0156 (-0.65)
PROD_CAP _{ji}	-0.451* (-1.82)	-0.282 (-1.31)	-0.0455 (-0.49)	-0.279** (-2.59)	0.0941 (1.49)
POL_REG _{ji}	-36.29*** (-4.17)	-0.343 (-0.56)	0.281** (2.39)	-0.0453 (-0.11)	-0.0316 (-0.24)
INFRA_ECO _{ji} * RTA _{ijt}	-0.0722 (-0.86)	-0.342 (-4.02)	-0.253 (-2.75)	0.144 (1.05)	-0.0119 (-0.53)
INFRA_ECO _{ji} * PCGDP _{it}	-0.128*** (-4.47)	-0.318** (-2.34)	0.0376 (0.69)	-0.105 (-1.68)	-0.00935 (-0.66)
PROD_CAP _{ji} * RTA _{ijt} = 1	-0.112 (-0.71)	0 (.)	0.250*** (2.87)	0.0873 (0.70)	-0.0848 (-1.09)
PROD_CAP _{ji} * PCGDP _{it}	0.257 (2.06)	0.133 (1.05)	0.0371 (0.47)	0.360** (2.38)	-0.0773 (-2.20)
POL_REG _{ji} * RTA _{ijt}	0 (.)	0 (.)	0 (.)	-0.0278 (-0.05)	0.0471 (0.28)
POL_REG _{ji} * PCGDP _{it}	29.75*** (4.05)	0.365 (0.93)	-0.360 (-2.52)	0.266 (0.78)	-0.0520 (-0.43)
Constant	15.38*** (250.70)	13.32*** (246.50)	14.48*** (246.09)	14.46*** (65.26)	13.03*** (390.44)
Observations	1845	1212	1336	4432	12586
Log-likelihood	-8267298.1	-5235232.7	-7403029.8	-12939644.4	-41110631.1
Pseudo R ²	0.997	0.980	0.992	0.991	0.978

Looking at the effect of AFT on recipient countries' imports, Table 4 also shows mixed results. AFT in economic infrastructure alone has a positive impact on imports for East-Asia and Middle East only⁵.

As for exports, AFT for production capacities has little impact on imports, except for North Africa, but in this case, positive effects are conditioned by RTAs. In the same way, positive effects of AFT are conditioned by economic development in Central and South Asia. Finally, policy regulation increases imports in North African countries only⁶.

⁵ Interestingly, these effects are be slightly undermined by their economic development. This may be explained that some countries in these regions, especially China, have already reached a critical development level, and thus the initial minimum conditions in terms of economic development. Thus, a further increase in GDP per capita does not necessarily improves the trade efficiency of AFT.

⁶ The negative direct effect for East Asia is balanced by a positive conditional effect due to GDP per capita.

Looking as sub-categories, AFT effects are generally small and mixed (Annex 2). In the infrastructure category, AFT in transports increases imports in East Asia only, whereas positive effects are observed conditionally to RTAs in Middle East, and conditionally to economic development in North Africa as well as Central and South Asia. AFT in communication and energy generally have insignificant effects on imports. With regard to production capacity, direct positive effects are observed for business services imports in East Asia and Sub-Saharan Africa; positive import effects are also found in agriculture for East Asia and Middle-East, in fisheries and industry for Central and South Asia, in tourism for East Asia and in mining for sub-Saharan Africa. Conditional effects can also be observed for some sub-sectors, both with RTAs and economic development. Finally, AFT in commercial policy regulations have limited import effects, except in sub-saharan Africa (negotiation and trade facilitation) and North Africa (commercial policies). Conditional effects are also generally small, except for commercial policy whose effect depends on economic development.

Table 5: the impact of institutional and national AFT for exports, by region and sectors

	East Asia	Middle-East	North Africa	Central and South Asia	Sub-Saharan Africa
NATIONAL (BILATERAL) _{ji}	0.0616 (0.58)	-9.988* (-7.79)	0.0728 (1.10)	0.268 (0.51)	-0.0592 (-1.35)
INSTITUTIONAL _{ji}	0.182* (1.81)	-0.0198 (-0.04)	0.171 (1.18)	-0.0216 (-0.11)	-0.127 (-1.15)
NATIONAL (BILATERAL) _{ji} * RTA _{ijt}	-0.00259 (-0.03)	1.851** (2.21)	0 (.)	-0.251 (-0.48)	0.103* (1.96)
NATIONAL (BILATERAL) _{ji} * PCGDP _{it}	-0.00259 (-0.03)	1.851** (2.21)	0 (.)	-0.251 (-0.48)	0.103* (1.96)
INSTITUTIONAL _{ji} * RTA _{ijt}	-0.0315 (-1.08)	0 (.)	0.230*** (3.34)	0.0581 (0.34)	0.142 (1.02)
INSTITUTIONAL _{ji} * PCGDP _{it}	-0.0577 (-1.19)	0.137 (0.54)	-0.238* (-1.94)	0.0782 (0.67)	0.152*** (2.80)
Constant	16.43*** (388.96)	13.23*** (77.07)	15.08*** (184.56)	14.91*** (65.55)	13.80*** (195.33)
<i>Observations</i>	2267	1316	1320	4594	12358
<i>Log-likelihood</i>	-12387405.1	-14177933.6	-18088778.1	-35274168.9	108956652.0
<i>Pseudo R²</i>	0.999	0.975	0.988	0.987	0.960

Tables 5 and 6 show the impact of national and institutional AFT. Although the results are also contrasted for both exports and imports, it can be observed that institutional AFT is generally more efficient than bilateral AFT. For example, institutional AFT makes it possible to increase exports of beneficiary countries in East Asia, North Africa and Sub-Saharan Africa (directly or conditionally); conversely, national AFT is only efficient conditionally in Sub-Saharan Africa; Similarly, bilateral AFT is insignificant for imports whereas institutional AFT has limited, but positive impacts in East Asia and Central and South Asia. The better efficiency of institutional AFT can be explained by various reasons, of which a better country coverage and aid coordination. A similar conclusion is found in Lemi (2017) et de Tadesse et al. (2017, 2022).

As a last result, Annex 3 shows that AFT is complementary to non-trade ODA. As a matter of facts, total AFT leads to an increase in exports mainly in East Asia (directly) as well as in North Africa and Sub-Saharan Africa (conditionally); in addition, non-trade ODA has positive additional effects in Middle-East and North Africa. In the same regard, AFT has positive import effects on Asia only (East, Central and South), whereas non-trade ODA has additional positive effects in sub-Saharan Africa.

Table 6: the impact of institutional and national AFT for imports, by region and sectors

	East Asia	Middle-East	North Africa	Central and South Asia	Sub-Saharan Africa
NATIONAL (BILATERAL) _{ji}	0.168 (0.91)	-0.764 (-1.00)	-0.0661 (-1.36)	0.0367 (1.43)	-0.00548 (-0.23)
INSTITUTIONAL _{ji}	0.476** (2.35)	0.252 (1.14)	0.0549 (0.78)	-0.183 (-2.38)	0.0225 (0.65)
NATIONAL (BILATERAL) _{ji} * RTA _{ijt}	-0.0713 (-0.43)	0.252 (0.66)	0 (.)	0 (.)	-0.0315 (-1.26)
NATIONAL (BILATERAL) _{ji} * PCGDP _{it}	-0.0663** (-2.08)	0.315 (0.96)	0.0679 (1.46)	-0.0633 (-1.06)	-0.0119 (-0.68)
INSTITUTIONAL _{ji} * RTA _{ijt}	-0.187** (-2.43)	0 (.)	-0.0576 (-1.24)	0.116** (2.31)	-0.0253 (-0.72)
INSTITUTIONAL _{ji} * PCGDP _{it}	-0.231*** (-2.68)	-0.110 (-0.82)	-0.0558 (-1.01)	0.176*** (2.61)	-0.0278 (-1.45)
Constante	15.40*** (186.18)	13.30*** (256.31)	14.47*** (168.31)	14.44*** (64.49)	13.02*** (380.97)
<i>Observations</i>	1845	1212	1336	4432	12586
<i>Log-likelihood</i>	-8518041.3	-5344805.8	-7409696.0	-12991958.1	-41121683.2
<i>Pseudo R²</i>	0.997	0.980	0.992	0.991	0.978

To sum up an discuss these results, it has been shown that AFT has limited and differentiated effects. Indeed, we have stressed that this effects were mixed, greatly depending on the AFT category, the region considered, the type of flow (imports or exports) and the type of AFT (national or institutional).

These global -mixed- results slightly differ from the existing literature which tends to conclude to more straightforward positive effects of AFT (though differentiated by sector and region). This difference can be explained by several reasons: the choice of the estimation procedure, and especially the 3 fixed-effects tend to better capture unobserved effects that could otherwise be passed on through the parameter of AFT, rendering these parameters significant due to biases of omitted variables; in addition, the high disaggregation level of our data and estimation by numerous sectors and regions captures more precise information which leads to more important differentiated effects. Finally, the decomposition of the AFT marginal effect into direct and conditional effects undermines the direct effect of the AFT. This decomposition has never been applied in the existing literature, in which the effect of AFT partly includes interaction and unobserved effects, leading to a more positive impact of AFT.

In spite of these mixed effects, several key features are emerging from all these results. First, from a regional perspective, AFT as a greater impact on two regions:

East Asia and Middle East countries. Second, when considering initial conditions, i.e. the presence of an RTA or the economic development stage, positive trade effects also appear for other regions, mainly North Africa as well as Central and South Asia in specific sectors. This means that AFT alone is not always a sufficient condition for enhancing trade of recipient countries. As prerequisites, the implementation of an RTA and a minimum development level are sometimes necessary to help AFT increasing trade. Interestingly, the AFT impact for Sub-Saharan Africa is small. This questions the efficiency of the AFT in this region, which receives a significant share of total AFT. Conversely, AFT seems more efficient in East Asia. This suggests that the efficiency of AFT is not directly related to the amount granted to recipient countries.

Considering AFT categories, results tend to show that AFT in infrastructure is the most efficient, especially transports, whereas AFT in communication and energy may have positive effects, but conditionally to RTAs or economic development. AFT in production capacity shows smaller effects, except when associated with RTAs in North Africa or East Asia. However, some positive effects can be observed, mainly for imports in some sub-categories, e.g. business services, agriculture, industry or tourism. Finally, AFT dedicated to commercial policy regulation generally show small or insignificant effects. In particular, trade facilitation, which have been central in WTO negotiations in the past 10 years, does not seem to significantly impact the trade performance of recipient countries. This can be partly explained by the small amounts dedicated to policy regulation, as shown in Figure 1. However, it appears that these amounts are not very efficient to increase recipient countries' trade performance.

The two other main results suggest that institutional AFT is more efficient than bilateral ones and that AFT complements non-trade ODA in boosting recipient countries' trade performance, as explained previously.

These results are robust after sensitivity analysis. In particular, the model has been re-estimated by excluding zero variables, or by using alternative estimators. In addition, the presence of AFT observations equal to zero has been alternatively tackled following Wagner (2003), who suggests using the following formula: $\ln AFT_{ijt} = \ln[\max(1, AFT_{ijt})]$. Results are not significantly changed. Further research may be considered by specifically including dynamics in each region, such as structural changes, governance or crises, in additional interaction terms.

5. CONCLUSION AND POLICY IMPLICATIONS

The present article aims to assess the impact of the EU AFT on trade with recipient countries, at a disaggregated level. Indeed, our analysis includes 89 recipient countries, 3 AFT sectors, 17 sub-sectors and 5 regions. It also distinguishes institutional and bilateral AFT as well as AFT with non-trade ODA. From an econometric point of view, it relies on the PPML estimator as a means of tackling properly heteroskedasticity and zero-observations. In addition, the question of endogeneity, unobserved effects and multilateral resistance are carefully addressed though the inclusion of 3 fixed-effects. Overall, this article contributes to the literature though the high disaggregation level, the estimation method and the choice of specific interaction terms (which account for initial conditions).

Our results suggest that AFT has often small and mixed effects on beneficiary countries, as the AFT trade impact heavily depends on the type of flows (imports or exports), the region and the sector considered, the AFT type (institutional or bilateral) as well as the existence of initial conditions, such as the presence of an RTA or the economic development level of the recipient country. These results complement the existing literature and go further in several ways: first, it generally reveals smaller AFT effects than in many existing articles. As explained above, this may be due to the more precise estimation method, especially the inclusion of 3 fixed effects, the very high disaggregation level, which uses more specific data and information as well as the AFT decomposition into direct and conditional effects.

Second, East Asia seem to have increased more its trade performance due to AFT than the other regions. In addition, AFT in infrastructure has also a greater impact than other AFT categories. AFT in production capacities show differentiated effects, with positive effects in some limited regions and sub-sectors (business services, agriculture, industry or tourism).

Third, it is shown that the impact of AFT is often conditioned by initial conditions in terms of RTAs or economic development. This is a specific contribution of this article, which indicated that AFT alone is not always a sufficient condition to increase recipient countries' trade performance.

Finally, results suggest that the institutional AFT is more efficient than bilateral AFT and that the positive trade impact of AFT can be complemented with non-trade ODA. This suggests that AFT and non-trade ODA can both contribute to the inclusion of recipient countries in world trade.

These results imply several policy implications. First, the fact that AFT has small and differentiated effects raises the question of its efficiency. In other words, given the huge cost of AFT for donor countries, there is a need for better controlling and tracing the use of AFT in recipient countries in order to increase its efficiency. In addition, micro impact studies are necessary in order to precisely assess the impact of specific AFT. For example, the AFT dedicated to trade facilitation should be assessed in each recipient countries, so as to make sure that the objective (increasing trade) is accompanied by appropriate and efficient tools.

Another key implication is the role of appropriate initial conditions for rendering AFT more efficient. For example, it has been shown that the presence of RTA or an initial minimum development level could make AFT more efficient. Consequently, implementing appropriate RTA and using specific non-trade ODA to boost the economic development of recipient countries are necessary as AFT accompanying policies.

The coordination of AFT across donor countries is also an interesting policy, given that national (bilateral) AFT is not currently enough coordinated across EU countries. This may explain that national AFT is less efficient than the institutional (EU) one. This also raises the question of the control of the use of national AFT in recipient countries. Better coordination of AFT could be improved through a single international agency in charge of the distribution of national AFT.

To sum up, AFT needs to become more efficient for achieving its aim. This is why increased cooperation, coordination, control, tracing and impact assessing seem to be promising lines of thought.

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ANNEX 1: IMPACT OF AFT ON EXPORTS BY REGION AND SUB-SECTORS

A. INFRASTRUCTURE

	East Asia	Middle-East	North Africa	Central and South Asia	Sub-Saharan Africa
TRANSPORT _{ij}	-0.136 (-1.55)	1.907 (0.58)	0.00329 (0.05)	-0.130 (.)	0.0147 (0.19)
COMMUNICATION _{ij}	0.0721 (1.46)	-4.396* (-1.78)	0.0801 (0.38)	7.071 (.)	-0.530*** (-3.93)
ENERGY _{ij}	0.0755 (1.22)	0.582 (1.11)	0.152*** (2.63)	1.057 (.)	-0.106* (-1.68)
TRANSPORT _{ij} * RTA _{ijt}	0.179*** (2.97)	-1.704 (-0.60)	-0.243* (-1.68)	0.156 (.)	0.0606 (0.89)
TRANSPORT _{ij} * PCGDP _{it}	-0.0199 (-0.83)	-0.925 (-0.61)	0.000957 (0.02)	0.0894 (.)	0.0448 (1.15)
COMMUNICATION _{ij} * RTA _{ijt}	0 (.)	2.938* (1.85)	0 (.)	-8.133 (.)	0.518*** (4.62)
COMMUNICATIONS _{ij} * PCGDP _{it}	-0.0376 (-1.17)	1.916* (1.73)	-0.0605 (-0.31)	2.471 (.)	0.195*** (3.14)
ENERGY _{ij} * RTA _{ijt}	-0.110* (-3.11)	-1.212 (-1.76)	0.638*** (3.84)	-1.047 (.)	0.283*** (3.71)
ENERGY _{ij} * PCGDP _{it}	0.0132 (0.52)	-0.253 (-0.80)	-0.138 (-2.59)	0.0714 (.)	0.0970** (2.48)
Constant	16.46*** (470.47)	13.14*** (78.70)	14.98*** (276.38)	14.96 (.)	13.80*** (190.48)
<i>Observations</i>	2267	1316	1320	4594	12358
<i>Log-likelihood</i>	-12279097.7	-14068442.9	-17968929.1	-34170011.9	-107123063.0
<i>Pseudo R²</i>	0.999	0.976	0.988	0.988	0.961

B. PRODUCTION CAPACITY

	East Asia	Middle-East	North Africa	Central and South Asia	Sub-Saharan Africa
FINANCE _{ji}	0.0165 (.)	-1.155 (-1.28)	-0.00525 (-0.03)	0.541*** (3.33)	-0.0403 (-0.54)
BUSINESS _{ji}	-0.196 (.)	-0.181 (-0.07)	0.0929 (0.41)	-0.249 (-0.50)	-0.0582 (-0.60)
AGRICULTURE _{ji}	-0.0142 (.)	0.125 (0.48)	-0.220 (-1.49)	0.100 (0.85)	-0.0779 (-1.28)
FISHERIES _{ji}	-0.0806 (.)		-0.0621 (-0.21)	0.0287 (0.34)	-0.00100 (-0.01)
FORESTRY _{ji}	-0.252 (.)	9.290 (0.42)	4.919 (0.73)	-1.360 (-0.98)	-0.208** (-1.99)
INDUSTRY _{ji}	0.0520 (.)	0.726* (1.81)	0.184 (1.44)	0.640 (1.45)	0.0631 (0.77)
MINING _{ji}	0.607 (.)		0.228 (0.66)	0.970 (0.71)	-0.0761 (-0.21)
TOURISM _{ji}	0.222 (.)		5.300 (1.58)	0.159 (0.37)	0.309 (1.09)
FINANCE _{ji} * RTA _{ijt}	-0.0187 (.)	1.018 (1.55)	0.0679 (0.34)	-0.561 (-3.46)	0.106 (1.27)
FINANCE _{ji} * PCGDP _{it}	0.00453 (.)	0.729 (1.63)	-0.0139 (-0.09)	0.0872** (2.48)	0.0194 (0.39)
BUSINESS _{ji} * RTA _{ijt}	0.0296 (.)	0.583 (0.29)	0 (.)	0.285 (0.57)	-0.0313 (-0.27)
BUSINESS _{ji} * PCGDP _{it}	0.0768 (.)	-0.0123 (-0.01)	-0.102 (-0.55)	-0.124** (-2.00)	-0.00328 (-0.06)
AGRICULTURE _{ji} * RTA _{ijt}	-0.0167 (.)	0.856*** (3.17)	-0.0837 (-0.52)	-0.0913 (-0.75)	0.0316 (0.40)
AGRICULTURE _{ji} * PCGDP _{it}	0.00760 (.)	-0.137 (-0.85)	0.112 (0.93)	0.0651 (1.15)	0.0153 (0.41)
FISHERIES _{ji} * RTA _{ijt}	0 (.)	0 (.)	-0.937 (-1.04)	0 (.)	-0.0932 (-0.70)
FISHERIES _{ji} * PCGDP _{it}	0.196 (.)	0 (.)	0.144 (0.51)	0.129 (0.89)	0.0739 (0.32)
FORESTRY _{ji} * RTA _{ijt}	0.191 (.)	0 (.)	0 (.)	1.364 (0.98)	0.342* (1.88)
FORESTRY _{ji} * PCGDP _{it}	0.0498 (.)	-4.043 (-0.40)	-4.584 (-0.73)	0.192* (1.70)	0.0463 (0.57)
INDUSTRY _{ji} * RTA _{ijt}	-0.0627 (.)	0.102 (0.39)	-0.146 (-1.11)	-0.640 (-1.45)	0.194 (1.26)
INDUSTRY _{ji} * PCGDP _{it}	-0.00864 (.)	-0.750*** (-2.59)	-0.161 (-1.55)	0.0632 (1.32)	-0.0277 (-0.43)
MINING _{ji} * RTA _{ijt}	-0.282 (.)	0 (.)	0 (.)	-1.763 (-1.34)	-0.0644 (-0.26)
MINING _{ji} * PCGDP _{it}	-0.338 (.)	0 (.)	-0.198 (-0.65)	-0.0332 (-0.07)	-0.228 (-0.61)
TOURISM _{ji} * RTA _{ijt}	0 (.)	0 (.)	0 (.)	-0.249 (-0.59)	-0.456** (-2.10)
TOURISM _{ji} * PCGDP _{it}	-0.106 (.)	0 (.)	-3.704 (-1.57)	-0.151 (-1.20)	0.00321 (0.02)
Constant	16.48 (.)	13.54*** (72.27)	15.03*** (234.93)	14.88*** (69.45)	13.80*** (206.87)
<i>Observations</i>	2267	1316	1320	4594	12358
<i>Log-likelihood</i>	-11865756.3	-13035319.0	-17561071.4	-33980442.2	-107366633.7
<i>Pseudo R²</i>	0.999	0.977	0.988	0.988	0.961

C. POLICY REGULATION

	East Asia	Middle-East	North Africa	Central and South Asia	Sub-Saharan Africa
NEGOTIATIONS _{ji}	0 (.)	0 (.)	0 (.)	0 (.)	0.941** (2.34)
FACILITATION _{ji}	-0.508** (-5.90)	18.93 (1.49)	-0.285* (-2.26)	-516.3 (-0.86)	-0.365** (-2.62)
EDUCATION _{ji}	-10.76 (-1.19)	516.4 (1.58)			6.450 (1.40)
AJUSTMENT _{ji}	0 (.)	0 (.)	0 (.)	0 (.)	-0.461 (-0.72)
AFT RTA _{ji}	0 (.)	0 (.)	0 (.)	0 (.)	0.240 (0.54)
TRADE POLICY _{ji}	-0.0107 (-0.05)	1.239 (0.72)	0.0164 (0.09)	0.287 (0.58)	-0.318* (-1.74)
NEGOTIATIONS _{ji} * RTA _{ijt}	0 (.)	0 (.)	0 (.)	0 (.)	0 (.)
NEGOTIATIONS _{ji} * PCGDP _{ijt}	0 (.)	0 (.)	0 (.)	0 (.)	0 (.)
FACILITATION _{ji} * RTA _{ijt}	0 (.)	0 (.)	0 (.)	76.06*** (4.55)	0.904** (2.00)
FACILITATION _{ji} * PCGDP _{ijt}	0 (.)	-12.37 (-1.50)	0 (.)	-958.8 (-0.86)	0.110 (0.48)
EDUCATION _{ji} * RTA _{ijt}	0 (.)	0 (.)	0 (.)	0 (.)	0 (.)
EDUCATION _{ji} * PCGDP _{ijt}	8.814 (1.24)	-265.9 (-1.56)	0 (.)	0 (.)	0 (.)
AJUSTMENT _{ji} * RTA _{ijt}	0 (.)	0 (.)	0 (.)	0 (.)	-0.130 (-0.15)
AJUSTMENT _{ji} * PCGDP _{ijt}	0 (.)	0 (.)	0 (.)	0 (.)	0.985* (1.87)
AFT RTA _{ji} * RTA _{ijt}	0 (.)	0 (.)	0 (.)	0 (.)	0 (.)
AFT RTA _{ji} * PCGDP _{ijt}	0 (.)	0 (.)	0 (.)	0 (.)	0.346 (0.81)
TRADE POLICY _{ji} * RTA _{ijt}	-0.124 (-0.71)	0 (.)	0 (.)	-0.256 (-0.53)	0.418*** (3.20)
TRADE POLICY _{ji} * PCGDP _{ijt}	0.0576 (0.95)	-0.927 (-0.92)	-0.0247 (-0.13)	0.212 (1.27)	0.329*** (2.69)
Constant	16.46*** (454.38)	13.12*** (80.88)	15.01*** (280.46)	14.93*** (66.08)	13.79*** (207.05)
Observations	2267	1316	1320	4594	12358
Log-likelihood	-12319115.7	-14108683.9	-18028459.6	-35257216.2	-107635037.8
Pseudo R ²	0.999	0.976	0.988	0.987	0.961

ANNEX 2: IMPACT OF AFT ON IMPORTS BY REGION AND SUB-SECTORS**A. INFRASTRUCTURE**

	East Asia	Middle-East	North Africa	Central and South Asia	Sub-Saharan Africa
TRANSPORT _{ij}	0.152*** (3.79)	-1.106 (-1.36)	-0.0422 (-1.58)	-0.0420 (-0.90)	-0.0177 (-0.73)
COMMUNICATION _{ij}	-1.602*** (-2.75)	-0.522 (-0.74)	-0.0135 (-0.08)	1.120 (1.00)	0.00756 (0.10)
ENERGY _{ij}	0.118 (1.01)	0.0403 (0.22)	-0.0366 (-0.74)	0.304 (0.99)	-0.00199 (-0.08)
TRANSPORT _{ij} * RTA _{ijt}	0 (.)	1.009* (1.71)	-0.0287 (-0.29)	-0.00145 (-0.03)	-0.00300 (-0.11)
TRANSPORT _{ij} * PCGDP _{it}	-0.0773*** (-3.05)	0.581 (1.75)	0.0617*** (2.78)	0.123*** (2.94)	0.0156 (1.23)
COMMUNICATION _{ij} * RTA _{ijt}	0 (.)	0.105 (0.27)	0 (.)	-0.945 (-0.83)	-0.0841* (-1.67)
COMMUNICATIONS _{ij} * PCGDP _{it}	0.932*** (3.39)	0.106 (0.35)	0.0110 (0.07)	-0.226 (-0.75)	-0.00719 (-0.21)
ENERGY _{ij} * RTA _{ijt}	-0.0759 (-0.93)	-0.101 (-0.81)	-0.192** (-2.39)	-0.361 (-1.18)	0.00846 (0.36)
ENERGY _{ij} * PCGDP _{it}	-0.0585 (-1.04)	0.0348 (0.32)	0.0241 (0.53)	-0.140 (-2.81)	0.00191 (0.13)
Constant	15.29*** (299.96)	13.36*** (267.45)	14.47*** (236.75)	14.49*** (65.65)	13.03*** (396.71)
<i>Observations</i>	1845	1212	1336	4432	12586
<i>Log-likelihood</i>	-7857329.6	-5105108.3	-7196063.5	-12607247.4	-41079780.9
<i>Pseudo R²</i>	0.997	0.981	0.993	0.991	0.978

B. PRODUCTION CAPACITY

	East Asia	Middle-East	North Africa	Central and South Asia	Sub-Saharan Africa
FINANCE _{ji}	0.470 (1.47)	0.106 (0.49)	-0.0389 (-0.40)	0.0905 (1.10)	-0.0120 (-0.37)
BUSINESS _{ji}	1.265*** (2.80)	-1.357 (-1.60)	-0.0214 (-0.17)	-0.00399 (-0.04)	0.0736** (2.06)
AGRICULTURE _{ji}	0.231** (2.25)	0.444** (2.47)	-0.121 (-1.48)	-0.102 (-1.23)	0.0358 (1.54)
FISHERIES _{ji}	-0.484*** (-4.89)		-0.228 (-1.16)	0.314*** (3.26)	-0.124 (-1.27)
FORESTRY _{ji}	0.0662 (0.25)	28.51** (2.25)	-6.110** (-2.07)	0.0350 (0.11)	-0.0321 (-0.56)
INDUSTRY _{ji}	0.0367 (0.28)	0.204 (1.11)	0.0666 (1.00)	0.392*** (3.97)	-0.0186 (-0.58)
MINING _{ji}	0 (.)	0 (.)	-0.0287 (-0.14)	-0.678** (-2.22)	0.443** (2.05)
TOURISM _{ji}	0.748*** (2.91)		-2.762 (-1.48)	0.0727 (0.36)	-0.121 (-0.66)
FINANCE _{ji} * RTA _{ijt}	-0.789** (-2.51)	-0.102 (-0.63)	0.781*** (4.46)	-0.153* (-1.73)	-0.0536 (-1.46)
FINANCE _{ji} * PCGDP _{it}	0.285*** (4.88)	-0.0418 (-0.40)	0.0559 (0.60)	0.127*** (2.75)	0.0156 (0.78)
BUSINESS _{ji} * RTA _{ijt}	-1.358*** (-4.65)	0 (.)	0 (.)	0.0169 (0.16)	-0.0535 (-1.31)
BUSINESS _{ji} * PCGDP _{it}	0.0675 (0.45)	0.860 (1.50)	-0.0251 (-0.23)	-0.00730 (-0.14)	-0.0345 (-1.36)
AGRICULTURE _{ji} * RTA _{ijt}	-0.129* (-1.68)	-0.205 (-1.27)	0.114 (1.45)	0.151 (1.50)	-0.00110 (-0.04)
AGRICULTURE _{ji} * PCGDP _{it}	-0.193*** (-3.50)	-0.266** (-2.52)	0.0876 (1.50)	-0.0682 (-1.17)	-0.0179 (-1.17)
FISHERIES _{ji} * RTA _{ijt}	0 (.)	0 (.)	0.218 (0.46)	0 (.)	0.222* (1.79)
FISHERIES _{ji} * PCGDP _{it}	0.872*** (3.03)	0 (.)	0.224 (1.08)	0.596*** (3.68)	0.274* (1.92)
FORESTRY _{ji} * RTA _{ijt}	-0.0930 (-1.27)	0 (.)	0 (.)	0.134 (0.44)	-0.143 (-1.23)
FORESTRY _{ji} * PCGDP _{it}	-0.00328 (-0.02)	-12.96** (-2.20)	5.812** (2.11)	0.124 (1.01)	0.0553 (1.23)
INDUSTRY _{ji} * RTA _{ijt}	-0.0780 (-0.91)	-0.176 (-1.30)	0.253** (2.51)	-0.401*** (-3.75)	0.0412 (0.79)
INDUSTRY _{ji} * PCGDP _{it}	0.0320 (0.57)	0.00899 (0.08)	-0.0504 (-0.93)	-0.0255 (-0.56)	-0.0255 (-1.03)
MINING _{ji} * RTA _{ijt}	0 (.)	0 (.)	0 (.)	0 (.)	-0.304* (-1.65)
MINING _{ji} * PCGDP _{it}	0 (.)	0 (.)	0.0374 (0.21)	-0.963*** (-2.96)	0.0392 (0.21)
TOURISM _{ji} * RTA _{ijt}	0 (.)	0 (.)	0 (.)	0.0500 (0.29)	-0.0656 (-0.41)
TOURISM _{ji} * PCGDP _{it}	-0.532*** (-3.46)	0 (.)	1.920 (1.48)	0.0221 (0.24)	-0.0796 (-0.53)
Constant	15.42*** (316.42)	13.34*** (259.10)	14.48*** (228.65)	14.48*** (65.94)	13.02*** (395.53)
Observations	1845	1212	1336	4432	12586
Log-likelihood	-7112646.8	-5053457.3	-7122645.1	-12703119.1	-40670944.7
Pseudo R ²	0.997	0.981	0.993	0.991	0.978

C. POLICY REGULATION

	East Asia	Middle-East	North Africa	Central and South Asia	Sub-Saharan Africa
NEGOTIATIONS _{ji}	0 (.)	0 (.)	0 (.)	0 (.)	0.189* (1.85)
FACILITATION _{ji}	-1.107*** (-8.66)	-4.790 (-0.80)	-0.109* (-1.68)	-382.2 (-1.24)	0.0914** (2.16)
EDUCATION _{ji}	0 (.)	40.63 (0.29)	0 (.)	0 (.)	-0.599 (-0.44)
AJUSTMENT _{ji}	0 (.)	0 (.)	0 (.)	0 (.)	-3.191 (-1.22)
AFT RTA _{ji}	0 (.)	0 (.)	0 (.)	0 (.)	-0.0403 (-0.18)
TRADE POLICY _{ji}	-1.407** (-2.51)	-0.595 (-1.34)	0.223* (1.95)	0.336 (0.99)	-0.0177 (-0.33)
NEGOTIATIONS _{ji} * RTA _{ijt}	0 (.)	0 (.)	0 (.)	0 (.)	0 (.)
NEGOTIATIONS _{ji} * PCGDP _{ijt}	0 (.)	0 (.)	0 (.)	0 (.)	0 (.)
FACILITATION _{ji} * RTA _{ijt}	0 (.)	0 (.)	0 (.)	-27.67*** (-2.65)	-0.339 (-0.65)
FACILITATION _{ji} * PCGDP _{ijt}	0 (.)	3.264 (0.83)	0 (.)	-710.2 (-1.24)	0.0860 (0.84)
EDUCATION _{ji} * RTA _{ijt}	0 (.)	0 (.)	0 (.)	0 (.)	0 (.)
EDUCATION _{ji} * PCGDP _{ijt}	0 (.)	-20.63 (-0.28)	0 (.)	0 (.)	0 (.)
AJUSTMENT _{ji} * RTA _{ijt}	0 (.)	0 (.)	0 (.)	0 (.)	3.506 (1.30)
AJUSTMENT _{ji} * PCGDP _{ijt}	0 (.)	0 (.)	0 (.)	0 (.)	-3.544 (-0.92)
AFT RTA _{ji} * RTA _{ijt}	0 (.)	0 (.)	0 (.)	0 (.)	0 (.)
AFT RTA _{ji} * PCGDP _{ijt}	0 (.)	0 (.)	0 (.)	0 (.)	0.0983 (0.41)
TRADE POLICY _{ji} * RTA _{ijt}	0.484 (1.40)	0 (.)	0 (.)	-0.310 (-0.98)	-0.120** (-2.41)
TRADE POLICY _{ji} * PCGDP _{ijt}	0.434** (2.33)	0.584** (2.36)	-0.277** (-2.13)	-0.0844 (-0.84)	0.00762 (0.23)
NEGOTIATIONS _{ji}	15.41*** (276.06)	13.32*** (241.54)	14.48*** (246.90)	14.47*** (65.27)	13.03*** (389.17)
<i>Observations</i>	1845	1212	1336	4432	12586
<i>Log-likelihood</i>	-8314157.7	-5112590.7	-7401190.6	-12936355.1	-40990988.7
<i>Pseudo R²</i>	0.997	0.981	0.992	0.991	0.978

ANNEX 3: IMPACT OF AFT AND NON-TRADE ODA

A. EXPORTS

	East Asia	Middle-East	North Africa	Central and South Asia	Sub-Saharan Africa
AFT	0.101** (2.18)	-0.0599 (-0.13)	0.0977 (1.25)	-0.0345 (-0.19)	-0.133 (-1.56)
NON TRADE ODA	0.0113 (0.86)	0.180*** (6.07)	0.0352** (2.21)	0.00429 (0.15)	-0.0291 (-1.11)
AFT*RTA	-0.0451* (-1.80)	-0.697*** (-3.17)	0.228*** (3.43)	0.0383 (0.23)	0.183** (2.18)
AFT*PCGDP	-0.0314 (-1.26)	0.279 (1.03)	-0.117* (-1.75)	0.0877 (0.92)	0.175*** (4.83)
Constant	-0.0309 (-1.13)	0.196 (0.76)	-0.118* (-1.77)	0.0756 (0.79)	0.175*** (4.83)
<i>Observations</i>	2267	1316	1320	4594	12358
<i>Log-likelihood</i>	-12446193.7	-14175113.3	-18179860.5	-35387873.6	-108855817.1
<i>Pseudo R²</i>	0.999	0.976	0.988	0.987	0.960

B. IMPORTS

	East Asia	Middle-East	North Africa	Central nad South Asia	Sub-Saharan Africa
AFT	0.274** (2.48)	0.247 (1.16)	-0.00709 (-0.11)	-0.123 (-1.56)	-0.00261 (-0.11)
NON TRADE ODA	0.0119 (0.56)	-0.0440* (-3.37)	-0.00251 (-0.16)	0.00114 (0.07)	0.0305*** (2.67)
AFT*RTA	-0.113 (-1.48)	-0.176* (-1.78)	-0.0588 (-1.26)	0.0938* (1.74)	-0.0250 (-1.14)
AFT*PCGDP	-0.127*** (-3.23)	-0.111 (-0.87)	-0.00433 (-0.08)	0.106 (1.44)	-0.0172 (-1.22)
Constant	15.35*** (283.05)	13.30*** (265.39)	14.49*** (259.87)	14.45*** (64.67)	13.03*** (391.72)
<i>Observations</i>	1845	1212	1336	4432	12586
<i>Log-likelihood</i>	-8605200.7	-5347710.5	-7490712.0	-13044385.1	-41149355.0
<i>Pseudo R²</i>	0.997	0.980	0.992	0.991	0.978

L'Aide pour le Commerce de l'UE et son impact sur ses échanges avec les pays récipiendaires : une évaluation désagrégée

Résumé – Cet article propose une évaluation de l'impact de l'Aide pour le Commerce (APC) sur les échanges commerciaux entre l'Union européenne (UE) et les pays bénéficiaires, à l'aide d'un modèle de gravité. L'originalité de l'article tient au fait tout d'abord qu'il retient un niveau de désagrégation élevé, par pays donateurs (les 22 pays de l'UE membres du comité d'aide au développement), par pays bénéficiaires (89 pays décomposés en 5 régions), par secteurs (3 secteurs et 17 sous-secteurs) et par catégories d'aide (nationale et institutionnelle). Deuxièmement, l'article distingue les effets directs de l'APC de ses effets indirects, conditionnels au niveau de développement ou à un accord de libre-échange avec l'UE. Enfin, le modèle économétrique utilise l'estimateur PPML et trois effets fixes, ce qui permet de traiter de manière précise les problèmes liés aux flux nuls, à l'hétéroscédasticité et à l'endogénéité. Les résultats montrent que l'APC a des effets globalement assez limités et surtout très contrastés selon les pays bénéficiaires, les secteurs et le type d'aide. L'Asie de l'Est semble la région pour laquelle elle est la plus efficace, contrairement à l'Afrique subsaharienne. Par ailleurs, l'aide institutionnelle semble plus efficace que l'aide nationale. Enfin, l'APC dédiée aux infrastructures a des effets plus importants que pour les autres secteurs (développement des capacités de production ou aide à la réglementation des politiques commerciales). Ces résultats ont d'importantes implications en termes de politiques économiques et de gestion de l'APC.

Mots-clés

Aide pour le Commerce
Modèle de gravité
Union européenne
