ODI Global

rani

Working Paper

Does EU aid promote EU exports?

Derrick Abudu, Max Mendez-Parra and
Dirk Willem te Velde

September 2026

Key messages

New econometric evidence indicates a positive association between official development assistance provided by EU institutions in Africa and EU exports to Africa.

A 10% increase in EU institutional aid would be associated with a 1.75% increase in EU goods exports. This is equivalent to approximately €5 in additional goods exports for every €1 of aid.

The effects are also strong for exports of services, particularly modern, digital and professional services: a 10% increase in aid is associated with an increase of up to 1.4% in services exports, or as much as €1.78 in additional exports per additional €1 of aid.

Taken together, each additional €1 of aid from EU institutions is associated with approximately €6.80 in additional exports of goods and services.

Even when it is not explicitly targeted at trade, EU aid may still lead to commercial benefits for European economies.

Development assistance and European commercial interests can be complementary.

Readers are encouraged to reproduce material for their own publications, as long as they are not being sold commercially. ODI Global requests due acknowledgement and a copy of the publication. For online use, we ask readers to link to the original resource on the ODI Global website. The views presented in this paper are those of the author(s) and do not necessarily represent the views of ODI Global or our partners.

© ODI Global 2026

This work is licensed under CC BY-NC-ND 4.0.

How to cite: Abudu, D., Mendez-Parra, M. and te Velde, D.W. (2026) *Does EU aid promote EU exports?* ODI Global Working Paper. London: ODI Global. (www.publications.com/does-eu-aid-promote-eu-exports)

Acknowledgements

About this publication

This paper presents econometric evidence on the impact of development assistance provided by EU institutions on EU exports of goods and services. It complements the case studies already produced and was developed with support and inputs from Resilience Action Network International (rani).

We are grateful to Eloise Todd, Jeroen Kwakkenbos and Courtney Carson for comments and encouragement. We also thank Yohannes Ayele for his contributions to the initial discussions that helped shape the study. All errors are the responsibility of the authors.

About the authors

Derrick Abudu is a Senior Research Officer at ODI Global.

Max Mendez-Parra is a Principal Research Fellow at ODI Global.

Dirk Willem te Velde is Principal Research Fellow and Director of International Economics Development at ODI Global.

Contents

Acknowledgements 3
Executive summary 7
1 Introduction 9
2 Literature review 12
3 Data, measurement and descriptive analyses 15
3.1 Data sources and sample 15
3.2 Measuring development assistance and exports 16
3.3 Descriptive analyses 17
4 Estimation strategy 26
5 Empirical results 29
5.1 Development assistance and goods exports 29
5.2 Development assistance and services exports 33
6 Robustness analysis 38
6.1 Heterogeneity in the aid–goods export relationship: major donors versus other donors 38
6.2 Heterogeneity in the aid–goods export relationship: recipient governance quality 39
6.3 Heterogeneity in the aid–services export relationship: major donors versus other donors 40
6.4 Heterogeneity in the aid–services export relationship: recipient governance quality 41
7 Conclusions and recommendations 43
References 47
Appendix 1 Donor summary statistics 50
Appendix 2 Recipient summary statistics 52
Appendix 3 EU Institutions' ODA and goods exports: major versus other donors 54
Appendix 4 Bilateral ODA and goods exports: major versus other donors 55
Appendix 5 Total ODA and goods exports: major versus other donors 56
Appendix 6 EU ODA and goods exports: heterogeneity by government effectiveness 57
Appendix 7 Bilateral ODA and goods exports: heterogeneity by government effectiveness 58

Appendix 8 Total ODA and goods exports: heterogeneity by government effectiveness 59

Appendix 9 EU ODA and services exports: major versus other donors 60

Appendix 10 Bilateral ODA and services exports: major versus other donors 61

Appendix 11 Total ODA and services exports: major versus other donors 62

Appendix 12 EU ODA and services exports: heterogeneity by government effectiveness 63

Appendix 13 Bilateral ODA and services exports: heterogeneity by government effectiveness 65

Appendix 14 Total ODA and services exports: heterogeneity by government effectiveness 67

Abbreviations and acronyms

AfT	Aid for Trade
BaTiS	Balanced Trade in Services (OECD–WTO)
CEPII	Centre d'études prospectives et d'informations internationales
CRS	Creditor Reporting System (OECD)
DAC	Development Assistance Committee
EU	European Union
FE	fixed effects
ODA	official development assistance
OECD	Organisation for Economic Co-operation and Development
OLS	Ordinary Least Squares
PPML	Poisson pseudo-maximum likelihood
PTA	preferential trade agreement
UK	United Kingdom
UN	United Nations
UN ECLAC	United Nations Economic Commission for Latin America and the Caribbean
US	United States
USITC	US International Trade Commission
WGI	Worldwide Governance Indicators
WTO	World Trade Organization

Executive summary

This paper finds a positive association between EU institutional development assistance to African countries and exports to those countries from EU Member States. Based on the aggregate levels of aid and trade covered in the analysis, a 10% increase in EU aid is associated with increases in exports equivalent to approximately €6.80 for each additional €1 of aid.

Official development assistance (ODA) is designed to support economic and social progress in partner countries, but donor governments are increasingly asking whether it also generates commercial returns at home. Evidence is emerging on individual EU Member States; we also ask whether development cooperation channelled through EU institutions has an impact on EU Member State exports. EU institutions' ODA pools contributions from 27 Member States and, before its departure from the EU, the UK. This paper asks whether such EU aid is associated with higher EU (including UK) exports to Africa, alongside bilateral ODA, using a donor–recipient–year panel covering 2005–2024 and a structural gravity model.

EU institutions' ODA is positively correlated with EU exports of goods to African recipients. In the preferred specification, a 10% increase in EU institutions' ODA is associated with an approximately 1.75% rise in donor goods exports, which is equivalent to €5.05 of additional exports per additional €1 of EU institutions' ODA.

The relationship is also very strong for exports of services. A 10% increase in EU institutions' ODA is associated with a 1.4% rise in total services exports (around €1.78 per additional €1 of ODA), and with even larger gains for other commercial services (2.0%) and modern services (2.1%) – the financial, digital and professional categories that increasingly define knowledge-intensive trade. Only traditional services show no significant association. The results are more pronounced for smaller donors and for recipients with weaker government effectiveness.

Overall, considering the impact on both exports of goods and exports of services, some €6.8 of exports from the EU are generated through each €1 spent on ODA by the EU institutions.

These findings build up an evidence base that shows that EU institutions' ODA, when it is not tied to trade, still leads to economic benefits for European economies that fund it. This should not be read as evidence that EU aid allocation is commercially motivated.

Development assistance can raise recipient incomes, lower trade costs and strengthen economic relationships in ways that benefit donors as a byproduct of, rather than a substitute for, its developmental purpose.

The central implication is one of complementarity rather than trade-off between European development cooperation and European commercial interests. The results do not provide a rationale for tying aid or allocating it with donor exports in mind. They do suggest that development assistance channelled through EU institutions in addition to assistance delivered bilaterally (on which there is by now an overwhelming evidence base) can support the EU's evolving economic partnership with Africa, with the clearest gains concentrated in modern services likely to shape that partnership going forward.

1 Introduction

Official development assistance (ODA) is provided with the aim of supporting economic and social progress in beneficiary countries. However, donor governments and taxpayers are increasingly interested in exploring the benefits that such development assistance generates for their own economies. The question is particularly important in the EU (and its Member States), where development commitments coexist with tight public finances and severe scrutiny of public spending.

A rapidly emerging literature analyses whether ODA is associated with higher exports by donor countries. However, this relationship has been analysed for bilateral development programmes and almost entirely for trade in goods. Whether ODA channelled collectively through the EU institutions carries a similar export impact for the European economies that fund it has received relatively less attention. More recently, Ayele et al. (2025, 2026) have given substantial attention to the economic impact of ODA in the EU. However, the limited attention given to services trade leaves unclear whether the association between ODA and donor exports extends beyond trade in goods, particularly to modern, knowledge-intensive services.

This gap matters because bilateral ODA and that from the EU institutions may differ in important ways. Bilateral programmes are designed and delivered by individual Member States, and may reflect national historical ties, sectoral strengths and foreign policy priorities that plausibly shape commercial outcomes. In contrast, ODA from EU institutions is, in principle, negotiated and disbursed collectively, pooling contributions from the 27 EU Member States and, reflecting its continued financial commitments following its withdrawal from the EU, the UK, into programming decided at the EU level.[1] If pooled ODA resources are associated with higher exports for the European economies that support it, this would suggest that the trade dimension of ODA extends well beyond nationally directed ODA programmes and tied procurement, with direct implications for how the EU designs and defends its external assistance budget.

This paper examines whether ODA allocated through EU institutions (but also disbursed bilaterally by EU Member States or combined as total ODA) is associated with increased donor exports of goods and services to African recipient countries. Using a donor–recipient panel spanning 2005–2024 that combines Organisation for Economic Co-

[1] For ease of reference, mentions of EU donors, EU economies and EU exports throughout this paper include the UK, unless otherwise stated.

operation and Development (OECD) Creditor Reporting System (CRS) aid data, Eurostat data on exports of goods and Balanced Trade in Services (BaTiS) data from the OECD and the World Trade Organization (WTO), incorporating standard gravity covariates, we estimate structural gravity models, with donor-year and recipient-year fixed effects (FE) absorbing time-varying multilateral resistance terms and other donor- and recipient-specific factors.

The paper makes four main contributions to the ODA–trade discussion. First, it goes beyond Aid for Trade (AfT) (Calì and te Velde, 2011) to overall ODA to test whether the donor–export relationship extends to ODA that is not explicitly targeted at trade. Second, it focuses on EU Member States' exports to African ODA recipients, a donor–region pairing that has received limited attention relative to the wider cross-country literature. Third, and central to the paper's contribution, it separately identifies bilateral ODA, allocated EU institutions' ODA and their combined total, allowing for direct comparison rather than conflation of the collectively and individually financed and nationally directed channels. Fourth, it extends the analysis to services trade (disaggregated into commercial, other commercial, modern and traditional categories) alongside goods, thereby addressing a segment of trade that the aid–export literature has largely overlooked.

The results indicate a broadly positive association between European ODA and donor exports that is not limited to bilateral aid and, particularly, extends to aid from EU institutions. Allocated EU institutions' ODA is positively associated with EU goods exports to Africa, and this relationship strengthens and becomes even more robust for services exports, with the largest correlations observed for modern, knowledge-intensive services categories. These patterns hold, with some variation, across donors of different sizes and across recipient countries with differing levels of government effectiveness, and are consistent with, while also extending, related findings on bilateral AfT and donor exports.

These findings should not be interpreted as evidence that EU institutions allocate ODA with the aim of promoting exports, nor do they establish a causal return to ODA. The identification strategy, and the paper's discussion, treat the estimated relationships as conditional correlations, and interpret them in light of the channels (recipient income growth, reduced trade costs, stronger commercial relationships) through which ODA can support donor exports without diminishing its developmental purpose. For policy-makers navigating the EU's external assistance budget and its evolving economic partnership with Africa, the results speak directly to whether development cooperation and export interest need to be viewed as competing objectives.

This paper is structured as follows. Section 2 reviews the existing evidence by discussing the related literature on ODA and donor exports, and presents the paper's focus on EU institutions' ODA and services trade within it. Section 3 describes the data sources, sample

and construction of the ODA and export measures, and presents descriptive analyses. Section 4 sets out the empirical strategy, including the structural gravity specification, the treatment of zero-ODA observations and other technical details necessary to understand the results in detail. Section 5 presents the main results for goods and services exports. Section 6 reports robustness checks that examine heterogeneity by donor size and by recipient government effectiveness. Section 7 discusses the results in relation to the existing literature, and their policy implications.

2 Literature review

Although ODA is motivated and intended primarily to support development in partner countries, it can also affect bilateral trade and generate economic benefits for donors. The literature identifies several channels through which this may occur, including higher recipient income and economic activity, procurement from donor countries, lower trade costs and stronger bilateral economic relationships (Suwa-Eisenmann and Verdier, 2007). A complementary paper to this study reviews the impact channels and presents case studies that document them (Agarwal et al., 2026).

To the extent that ODA finances infrastructure, human capital, institutions or productive activity, it can increase economic activity and purchasing power, thereby raising demand for imports. Higher donor exports can therefore arise as a consequence of successful ODA rather than because aid has been explicitly designed to advance (or has been tied to) donor commercial interests. This distinction matters because benefits to donor economies need not conflict with development objectives (Gulrajani and Calleja, 2021). ODA allocation itself may also reflect a combination of development, strategic and commercial considerations (Hoekman and Shingal, 2024).

A second channel is more directly commercial. Historically, substantial bilateral ODA was tied to procurement from donor countries. Although formal tying has declined, procurement may continue to favour donor suppliers (Meeks and Craviotto, 2021). Accordingly, formal measures of tied aid may therefore understate the commercial links associated with ODA. It should also be said that there is a considerable literature that suggests that tying aid is costly, adding as much as 50% to the costs of providing aid.

ODA can also promote donor exports without formal or informal tying. Sustained development cooperation may generate goodwill, strengthen commercial networks, increase familiarity with donor country firms and products, and reduce information and market entry costs. These effects may persist beyond the period in which aid is provided, particularly where firms establish relationships or acquire experience in recipient markets (Wagner, 2003; Nowak-Lehmann et al., 2009; Hühne et al., 2014; Nishitateno and Umetani, 2023).

Empirical studies generally find a positive relationship between aid and donor exports, although the magnitude of the estimated association varies substantially. Wagner (2003) finds positive donor export effects across several donors. Nowak-Lehmann et al. (2009) and Martínez-

Zarzoso et al. (2014) similarly find evidence that German aid promotes German exports. More recently, Martínez-Zarzoso and Lessing (2026), examining goods and services trade for five European donors, find positive donor export effects from overall ODA that are not attributable solely to the AfT component. They also find substantial heterogeneity across donors and recipient characteristics.

The related AfT literature provides further evidence on the mechanisms linking ODA and trade. Although AfT constitutes only one component of the overall ODA examined in this paper, it is particularly relevant because it targets productive capacity, economic infrastructure and trade-related institutions. Studies generally find positive trade effects, although these vary by aid category, country and methodology (Vijil and Wagner, 2012; Bearce et al., 2013; Cadot et al., 2014; Martínez-Zarzoso et al., 2017a, 2017b; Calì and te Velde, 2011, Ayele et al, 2025, 2026). For instance, Bearce et al. (2013) find positive effects of US AfT on recipient exports.

Importantly, mechanisms that improve recipient export capacity may simultaneously facilitate exports from donors to recipients. Better ports, roads, telecommunications and trade procedures can reduce bilateral trade costs in both directions. Hühne et al. (2014) find that AfT increases both recipient exports to donors and donor exports to recipients, although the former effect is generally larger. A positive relationship between aid and donor exports should therefore not, by itself, be interpreted as evidence of commercial motivation.

The literature also points to substantial donor heterogeneity. ODA allocations reflect different combinations of recipient need, historical relationships, foreign policy priorities and commercial interests (Younas, 2008; Hoeffler and Outram, 2011; Dreher et al., 2015). Donors also differ in programme design, sectoral focus and implementation arrangements. Brazys (2013) finds considerable differences in AfT effectiveness across donors, while Nishitateno and Umetani (2023) identify substantial variation in donor export effects among the largest AfT donors. Hoekman and Shingal (2024) likewise find heterogeneity among EU Member States. Aggregate estimates may therefore conceal important differences between major donors and the wider donor group.

The distinction between bilateral ODA and assistance provided through EU institutions introduces a further source of heterogeneity. Member States have considerable control over bilateral development programmes, which may reflect national historical relationships, sectoral strengths and foreign policy priorities. By contrast, ODA channelled through EU institutions reflects objectives negotiated collectively across Member States. The literature on European development policy points to persistent national differences despite greater EU-level coordination (Brazys and Lightfoot, 2016; Carbone and Keijzer, 2016; Delputte et al., 2016; Orbie and Carbone, 2016). Delegation to EU and other multilateral channels can, however, generate economies of scale, coordination benefits and access to specialised expertise, meaning that

differences between bilateral and EU ODA need not simply reflect different degrees of commercial interest (Michaelowa et al., 2017, 2018).

Hoekman and Shingal (2024) provide direct evidence of these differences for AfT. They find that bilateral AfT from EU Member States is associated with greater donor-to-recipient exports, whereas EU institutions' AfT is more strongly associated with recipient exports to the EU. This is consistent with institutional differences between the two channels, while also highlighting considerable heterogeneity across donors and programmes.

A further gap concerns services trade, as most of the aid–trade literature focuses on merchandise exports. Services are particularly sensitive to regulation, institutional quality, information, skills and digital connectivity (Francois and Hoekman 2010), while development projects can directly generate demand for engineering, construction, financial, information and communication technology, consultancy and other professional services. Hoekman and Shingal (2020, 2021) find that the relationship between AfT and services trade varies across recipients and types of assistance. There is therefore little reason to expect the magnitude or determinants of the ODA–export relationship to be identical for goods and services.

Taken together, the literature suggests a positive but heterogeneous relationship between ODA and bilateral trade. ODA may stimulate donor exports through procurement, information and goodwill effects, stronger economic relationships, lower trade costs and higher recipient import demand. The importance of these mechanisms can vary across donors, institutional channels and types of trade. Crucially, donor export gains are not in themselves evidence that aid is commercially motivated, since interventions that successfully relax recipient-side constraints may simultaneously increase bilateral trade.

This paper extends the literature in several respects. First, it considers overall ODA rather than AfT alone, capturing the broader relationship between development cooperation and donor exports. Second, it examines exports from EU Member States to African ODA recipients over 2005–2024, a donor–recipient pairing that has received relatively little attention in the literature. Third, it distinguishes bilateral ODA, EU institutions' ODA and their combined effect through total ODA. Finally, it examines both goods and services exports, with services further disaggregated into commercial, other commercial, modern and traditional services. The analysis therefore assesses whether ODA–export relationships documented largely for merchandise trade and AfT extend to broader ODA and to different categories of services.

3 Data, measurement and descriptive analyses

3.1 Data sources and sample

Our analysis draws on data for gross ODA and goods and services exports, alongside standard gravity variables and preferential trade agreement (PTA) indicators for EU Member States. The data used for all the analyses span the 2005–2024 period. To investigate the association between ODA and trade, we arrange the data as a donor–recipient–year panel, enabling ODA and trade flows, together with gravity covariates, to be matched by donor, recipient and year.

Data on ODA are obtained from the OECD's CRS.[2] The ODA sample comprises 28 donor countries – the 27 EU Member States and the UK – and 53 African recipient countries. Two types of ODA are collected: bilateral ODA, which comprises ODA provided directly by the EU Member States to recipient African countries; and EU institutions' ODA, which captures that provided by EU institutions to African recipients. Data on goods exports are obtained from Eurostat,[3] while the services data used for the analysis come from the OECD–WTO BaTiS dataset.[4] The goods and services datasets contain information for all 28 donors but cover 52 and 49 African export destinations, respectively.

Finally, information on the gravity indicators – the existence of a common legal origin and language, and bilateral distance between donor and recipient – is sourced from the US International Trade Commission's (USITC) Gravity Portal (Gurevich and Herman, 2018). We cross-check and complement information on these indicators with data obtained from the Centre d'études prospectives et d'informations internationales (CEPII) Gravity database (Conte et al., 2023). Both datasets also contain information on the existence of PTAs between EU donors and recipient African countries. We double-check and complement this information using the WTO's Regional Trade Agreements Database.[5]

Appendices 1 and 2 provide further information on ODA and goods and services exports for the donor and recipient samples.

[2] For more information see www.oecd.org/en/topics/policy-issues/official-development-assistance-oda.html
[3] See https://ec.europa.eu/eurostat/web/main/data/database
[4] See www.wto.org/english/res_e/statis_e/gstdh_batis_e.htm
[5] See https://rtais.wto.org/UI/PublicMaintainRTAHome.aspx

3.2 Measuring development assistance and exports

Institutional ODA data contain EU institutions' annual disbursement amounts provided to each African recipient. This means that, although EU Member States fund ODA disbursed through the EU institutions, there is no corresponding donor-level measure of EU institutions' ODA that can be directly matched to donor–recipient–year export flows. To address this, we use information on EU spending and revenue[6] to compute the annual shares of EU budget contributions made by each EU Member State. These annual budget shares are then used to allocate EU institutions' ODA across donors.

ODA provided bilaterally and through the EU institutions is originally reported on a different monetary basis from the goods trade data, which are expressed in constant 2021 euros. Given the paper's focus on EU ODA and, equally importantly, the need to strip out the influence of inflation and exchange rate movements over time, we transform the ODA data into constant 2021 euros using OECD Development Assistance Committee (DAC) deflators and exchange rates.[7] The DAC deflators account for both changes in prices within EU donor countries and changes in exchange rates, allowing aid flows from different donors and years to be expressed on a common constant price basis. We use the deflators for individual donors rather than the aggregate 'total DAC' deflator, thereby accounting for donor-specific differences in inflation and exchange rate movements. The resulting values are subsequently expressed in 2021 euros, giving us a measure of real rather than nominal ODA that is comparable across donors and over time.

We combine bilateral ODA with allocated EU institutions' ODA to construct total ODA, which captures each donor's overall annual ODA provided to a given African recipient. The analysis therefore considers three ODA indicators: bilateral ODA, allocated EU institutions' ODA and total ODA.

The BaTiS services data contain information at the sectoral level on manufacturing services on physical inputs owned by others (SA), maintenance and repair services n.i.e. (SB), transport (SC), travel (SD), construction (SE), insurance and pension services (SF), financial services (SG), charges for the use of intellectual property n.i.e. (SH), telecommunications, computer and information services (SI), other business services (SJ), personal, cultural and recreational services (SK) and government goods and services n.i.e. (SL).

Following common practice in the literature (Mishra et al., 2011; Ghani and O'Connell, 2014; Loungani et al., 2017; UN ECLAC, 2017; World Bank and WTO, 2023), we construct five services export aggregates. Total services comprise all services categories (SA–SL), while

[6] See https://commission.europa.eu/strategy-and-policy/eu-budget/long-term-eu-budget/2014-2020/spending-and-revenue_en

[7] Further information on the construction and application of these deflators and exchange rates is provided here: www.oecd.org/en/data/insights/data-explainers/2024/10/resources-for-reporting-development-finance-statistics.html

commercial services exclude government goods and services (SL) and therefore comprise SA–SK. Other commercial services comprise construction (SE), insurance and pension services (SF), financial services (SG), charges for the use of intellectual property (SH), telecommunications, computer and information services (SI), other business services (SJ) and personal, cultural and recreational services (SK) – that is, SE–SK.

We further distinguish modern services, comprising insurance and pension services (SF), financial services (SG), charges for the use of intellectual property (SH), telecommunications, computer and information services (SI) and other business services (SJ); and traditional services, comprising transport (SC), travel (SD), construction (SE) and personal, cultural and recreational services (SK).

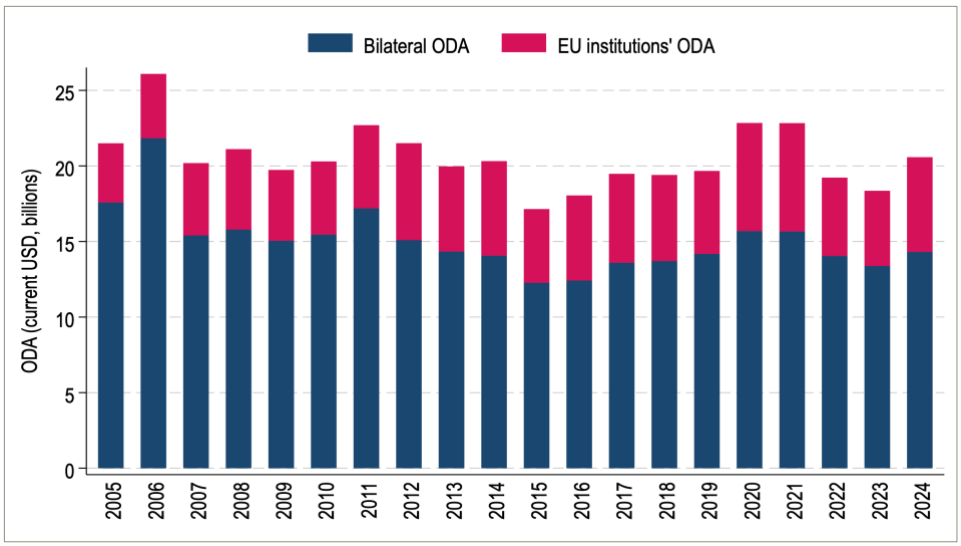
The original services data are reported in current US dollars. We convert these values into constant 2021 euros to make them comparable with the other monetary indicators used in the analysis and to account for the influence of inflation and exchange rate changes on changes in services exports over time.

3.3 Descriptive analyses

This section presents descriptive analyses (a set of stylised facts) on the evolution and distribution of ODA to African countries and the trends of goods and services exports from the EU.

Figure 1 presents the evolution of ODA to African recipients in current US dollars, while Figure 2 shows the corresponding trend in constant 2021 euros. The distinction is important, as movements in ODA measured in current US dollars reflect not only changes in the volume of assistance but also changes in prices and exchange rates. In nominal terms, ODA fluctuated considerably over 2005–2024, with periods of expansion followed by significant declines. The picture is similarly uneven in real terms: total ODA shows considerable year-to-year variation. Allocated EU institutions' ODA is about one-quarter of EU Member States' bilateral ODA.

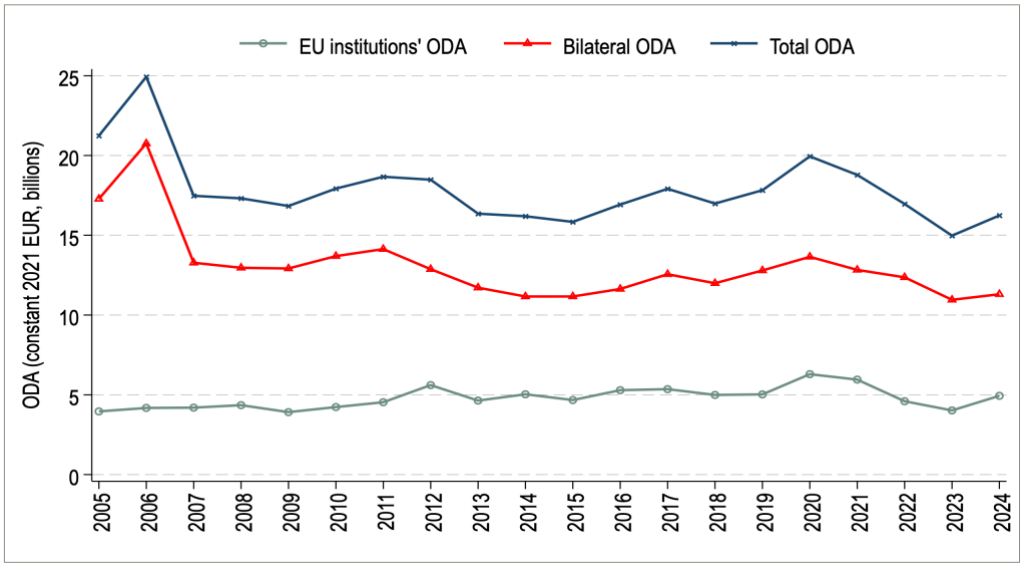
Figure 1 Bilateral and EU institutions' ODA to African recipient countries, 2005–2024 (current US$ billions)



Source: Authors' own calculations based on OECD CRS data

Notes: ODA values are in current US dollars. EU institutions' ODA is allocated across EU Member States based on their annual contributions to the EU budget. Total ODA is the sum of bilateral ODA provided directly by individual donors and their allocated share of EU institutions' ODA.

Figure 2 Bilateral and EU institutions' ODA to African recipient countries, 2005–2024 (constant 2021 € billions)



Source: Authors' own calculations based on OECD CRS data

Notes: ODA values are converted to constant 2021 euros using OECD exchange rates and deflators. EU institutions' ODA is allocated across EU Member States based on their annual contributions to the EU budget. Total ODA is the sum of bilateral ODA provided directly by individual donors and their allocated share of EU institutions' ODA.

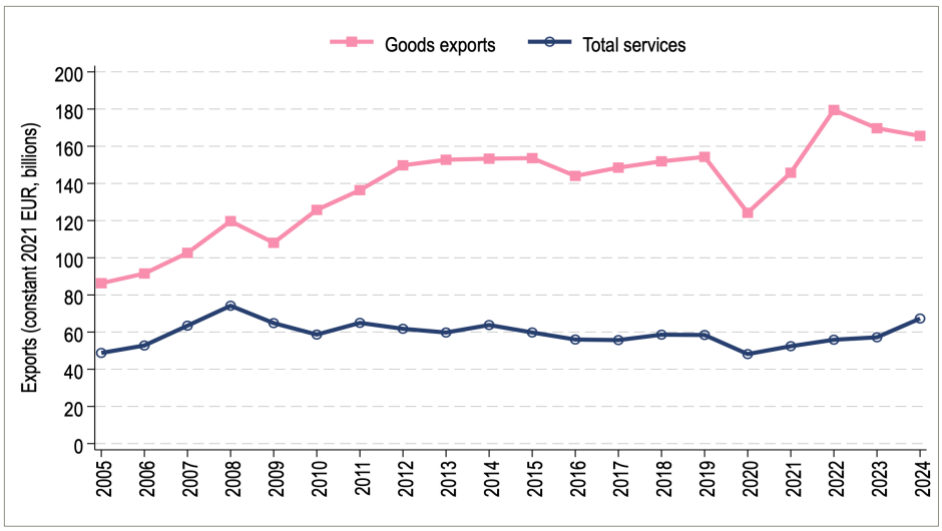
In real terms, total ODA stood at roughly €21 billion in 2005 before rising sharply to nearly €25 billion in 2006. This was followed by a considerable contraction, with total ODA falling to around €17 billion by 2007, after which it remained broadly within the €16–21 billion range for the remainder of the period. A temporary uptick occurred around 2020, when total ODA reached €20 billion, though this was for a short period; levels subsequently declined once more. By 2024, total ODA had fallen to approximately €16 billion, dipping below its value at the start of the sample period.

The changing composition of ODA over time also merits attention. Bilateral ODA accounts for the larger share throughout, yet its real value has diminished noticeably, from around €17 billion in 2005 to roughly €12 billion in 2024. EU institutions' ODA, in contrast, has proved more resilient. It increased from approximately €4 billion in 2005 to about €5 billion in 2024, having reached higher levels in the intervening years. Consequently, EU institutions have become relatively more prominent within the overall ODA landscape, even though bilateral assistance continues to constitute the dominant component.

The evolution of EU exports to African recipients presents a different picture (Figure 3) from that of ODA. Goods exports increased substantially over the period, albeit with several interruptions. They rose from around €86 billion in 2005 to €120 billion in 2008, before falling during the global financial crisis. Growth subsequently resumed, taking goods exports to around €150 billion by 2012 and above €150 billion towards the end of the 2010s. The sharp decline in 2020 coincided with the disruption to international trade associated with the COVID-19 pandemic. This was followed by a strong recovery, with goods exports reaching around €180 billion in 2022 before moderating to €166 billion in 2024.

Services exports growth was not as pronounced. Services exports increased strongly during the first few years, from around €49 billion in 2005 to €74 billion in 2008, but subsequently declined. For much of the period after 2010, total services exports remained between approximately €55 billion and €65 billion. They also fell sharply in 2020 as a result of the effects of COVID-19, before recovering to around €67 billion by 2024.

Figure 3 EU exports of goods and services to African recipients, 2005–2024 (constant 2021 € billions)



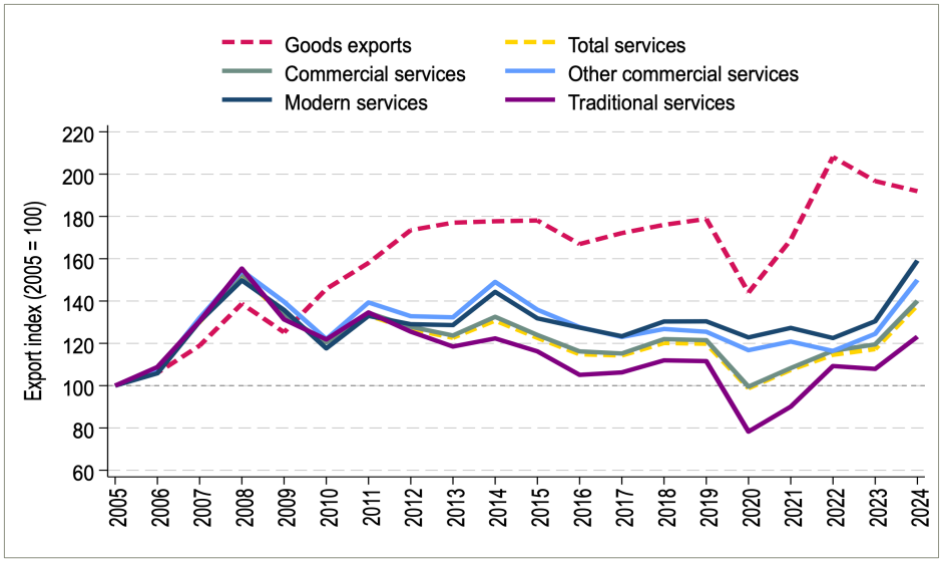
Source: Authors' own calculations based on Eurostat data for goods and OECD–WTO BaTIS data for services

Notes: Export values are expressed in constant 2021 euros and reported in billions.

These differences become clearer when exports are indexed to their 2005 values (Figure 4), to ascertain their growth. By 2024, goods exports were approximately 92% higher than in 2005. Total services exports, by comparison, were around 38% above the 2005 level. The long-run expansion in EU exports to Africa has therefore been driven much more strongly by goods than by services.

There is, however, considerable variation within services. Modern services have performed particularly strongly and, by 2024, were almost 60% above their 2005 level. Traditional services increased much more slowly and were only around one-quarter above their initial level. The difference was especially pronounced during the pandemic: traditional services fell to well below their 2005 level in 2020, reflecting the greater exposure of activities such as travel and transport to mobility restrictions. Modern services were substantially more resilient.

Figure 4 Growth of goods and services exports to African recipients, 2005–2024

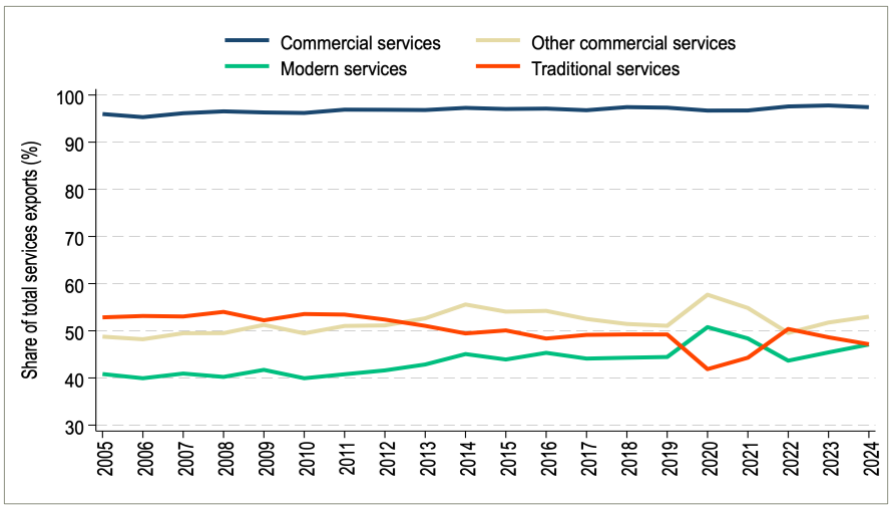


Source: Authors' own calculations based on Eurostat data for goods and OECD–WTO BaTIS data for services

Notes: All series are expressed in constant 2021 euros and indexed to 100 in 2005. Commercial services comprise all services excluding government goods and services. Other commercial services comprise construction through personal, cultural and recreational services. Modern services comprise insurance and pension services; financial services; intellectual property services; telecommunications, computer and information services; and other business services; traditional services comprise transport; travel; construction; and personal, cultural and recreational services.

Figure 5 provides a complementary view by examining the contribution of different categories to total services exports.

Figure 5 Relative importance of services export categories to African recipients, 2005–2024 (%)



Source: Authors' own calculations based on OECD–WTO BaTIS data

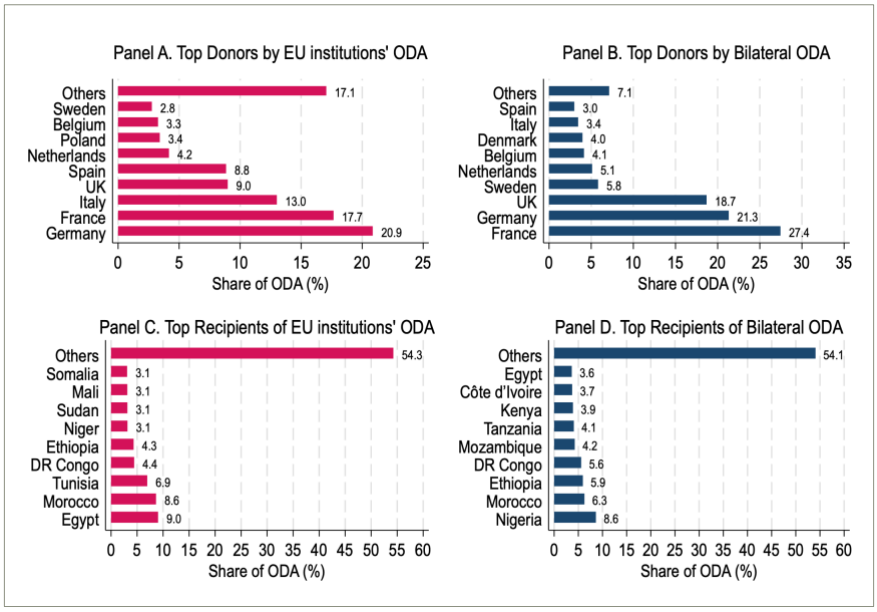
Notes: Shares are calculated as the value of exports in each services category as a percentage of total services exports. Commercial services comprise all services excluding government goods and services. Other commercial services comprise construction through personal, cultural and recreational services. Modern services comprise insurance and pension services; financial services; intellectual property services; telecommunications, computer and information services; and other business services. Traditional services comprise transport; travel; construction; and personal, cultural and recreational services. The categories are analytical groupings and are not mutually exclusive; therefore, their shares are not intended to sum to 100%.

Commercial services dominate throughout the period, accounting for roughly 95–98% of total services exports. Beneath this relatively stable aggregate share, however, the composition of services trade has changed. Modern services accounted for around 41% of total services exports in 2005, compared with approximately 53% for traditional services. Over the following two decades, this gap progressively narrowed. By 2024, modern services represented around 47% of total services exports, almost identical to the share of traditional services.

The pandemic had a significant impact on certain services categories. The share of traditional services fell sharply in 2020, while the relative importance of modern services increased. Part of this change was subsequently reversed as travel and other traditional service activities recovered, but the longer-run picture remains one of convergence between the two categories. This gradual shift matters because aggregate services exports can conceal quite different dynamics across activities. The stronger performance of modern services suggests that the nature of EU services trade with African economies has itself been changing. It also reinforces the value of looking beyond total services in the empirical analysis, since the relationship between ODA and exports may not necessarily be uniform across different types of services.

The aggregate trends also hide substantial differences across individual donor countries. Figure 6 shows the distribution of EU institutions' ODA allocations and bilateral ODA across donors, alongside their distribution across African recipients. Note that the left-hand panel is an implied allocation rather than a description of what happens in practice. For the purposes of the analysis, we allocate EU institutions' ODA to Member States using their annual shares of contributions to the EU budget. The figure therefore shows the implied concentration of EU institutions' ODA under this allocation methodology, rather than actual Member State-specific disbursements through EU institutions.

Figure 6 Concentration of ODA to African recipients by donors and recipients, 2005–2024 (% of ODA)



Source: Authors' own calculations based on OECD CRS data

Notes: The figure presents the shares of ODA accounted for by the nine largest donors or recipients over 2005–2024, with all remaining countries grouped as 'Others'. ODA values are expressed in constant 2021 euros. EU institutions' ODA is allocated across EU Member States based on their annual contributions to the EU budget.

Bilateral ODA is particularly concentrated. France accounts for approximately 27% of bilateral ODA over the period, followed by Germany at around 22% and the UK at 19%. These three countries therefore account for roughly two-thirds of all bilateral ODA in the sample. Sweden and the Netherlands are also among the larger bilateral donors, and the five largest donors collectively provide close to four-fifths of bilateral assistance.

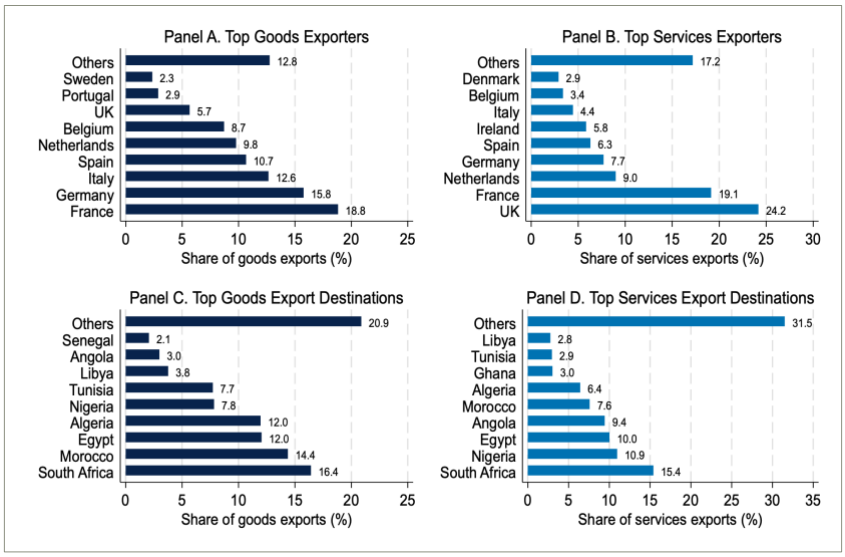
EU institutions' ODA allocations are somewhat less concentrated. Germany has the largest allocated share, at around 21%, followed by France at approximately 18% and Italy at 13%. The UK and Spain each account for around 9%. While a small group of large economies remains prominent, the share accounted for by other donors is larger than for bilateral ODA.

ODA is less concentrated on the recipient side. Egypt, Morocco and Tunisia are among the leading recipients of EU institutions' ODA, while Nigeria, Morocco, Ethiopia and Democratic Republic of the Congo are the prominent recipients of bilateral ODA. Nevertheless, countries outside the nine largest recipients collectively account for more than half of both forms of assistance. ODA is therefore concentrated much more strongly by source than by destination.

This donor concentration is particularly relevant to the empirical analysis. If a relatively small number of countries account for most bilateral assistance, estimates for the full donor sample could potentially mask important differences between the largest donors and the remainder. The descriptive evidence consequently provides a natural basis for examining major donor heterogeneity later in the analysis.

Figure 7 shows that EU exports to African countries are also unevenly distributed across donors.

Figure 7 Concentration of goods and services exports to African recipients, 2005–2024 (% of exports)



Source: Authors' own calculations based on Eurostat data for goods and OECD–WTO BaTIS data for services

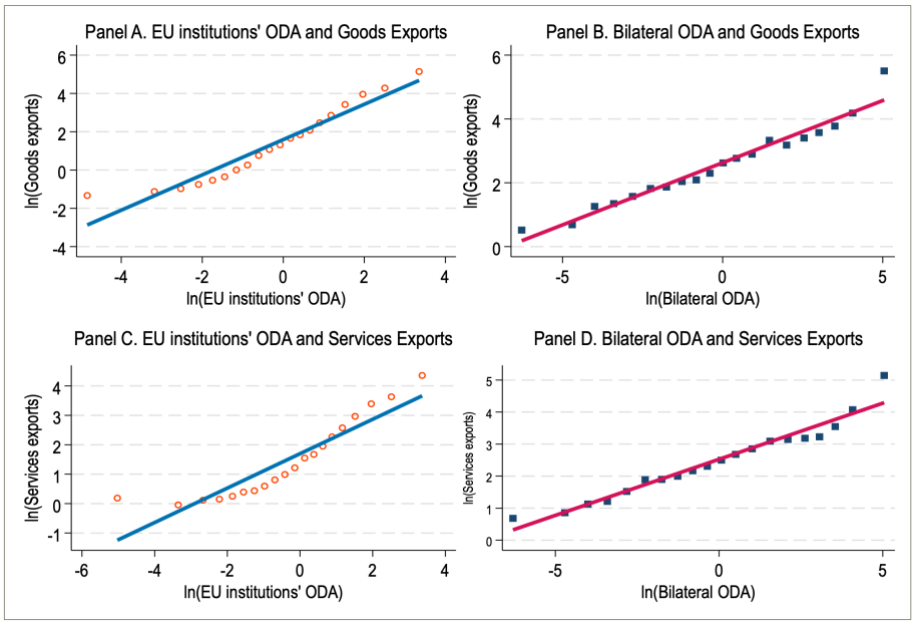
Notes: The figure presents the shares of goods and services exports accounted for by the nine largest exporters or destinations over 2005–2024, with all remaining countries grouped as 'Others'. Export values are expressed in constant 2021 euros.

France is the largest goods exporter in the sample, accounting for approximately 19% of goods exports, followed by Germany at around 16%. Italy, Spain and the Netherlands are also prominent. The picture is significantly different for services. The UK is by far the largest services exporter to African recipients, accounting for approximately 24% of the total. France follows at around 19%, while the Netherlands and Germany account for considerably smaller shares. The contrast is useful because it shows that prominence as an aid donor does not mirror prominence across different forms of trade.

There is also significant concentration on the destination side. South Africa is the largest individual destination for both goods and services exports, accounting for around 16% and 15%, respectively. Morocco and Egypt are particularly important goods markets, while Nigeria occupies a more prominent position in services trade. At the same time, the sizeable share represented by the remaining African economies, particularly for services, shows that EU export relationships extend beyond the handful of largest markets.

These patterns reveal an important feature of the data: the EU relationship with African economies is highly heterogeneous. The countries that provide the most ODA are not necessarily the largest exporters in every category, and the African economies receiving the most assistance are not the largest export destinations.

Figure 8 Relationship between ODA and exports to African recipients, 2005–2024



Source: Authors' own calculations based on OECD CRS data for ODA, Eurostat data for goods and OECD–WTO BaTIS data for services

Notes: ODA and export values are measured in millions of constant 2021 euros and transformed using natural logarithms. EU institutions' ODA is allocated across EU Member States based on their annual contributions to the EU budget.

Figure 8 shows the correlation between aid and trade. The scatter plots show a clear positive association between ODA and donor exports: more EU institutions' ODA and bilateral ODA are associated with more goods and services exports to African recipients. While these correlations do not establish causality, they provide a useful motivation for the empirical analysis that follows, which examines whether these relationships hold after accounting for other factors that influence bilateral trade.

4 Estimation strategy

To examine the relationship between EU Member States' ODA and exports to recipient African countries, we estimate structural gravity equations of the following form:

$$E\left(X_{ijt}^{k} \mid Z_{ijt}\right) = exp\begin{bmatrix} \alpha Aid_{ijt} + \beta_1 \ln D\,istance_{ij} + \beta_2 Legal_{ij} + \\ \beta_3 Language_{ij} + \beta_4 PTA_{ijt} + \delta_{it} + \delta_{jt} \end{bmatrix}, \quad (1)$$

where X_{ijt}^{k} is the value of exports from EU donor i to African recipient j in year t, with k denoting goods, total services or a particular services category. Aid_{ijt} denotes the log of ODA from donor i to recipient j in year t. We consider three measures of ODA: bilateral ODA, allocated EU institutions' ODA and total ODA. $lnDistance_{ij}$ is the logarithm of bilateral distance between donor i and recipient j, while $Legal_{ij}$ and $Language_{ij}$ are indicators for whether the pair shares a common legal origin and common language, respectively. PTA_{ijt} indicates the existence of an active PTA between the donor and the recipient. Finally, δ_{it} and δ_{jt} denote donor-year and recipient-year FE, respectively.

The inclusion of donor-year and recipient-year FE allows us to account for the multilateral resistance terms recommended in the structural gravity literature (Anderson and van Wincoop, 2003; Anderson and Yotov, 2010; Head and Mayer, 2014). Trade between a donor and recipient in a given year depends not only on bilateral trade costs between the two countries, but also on their trade costs relative to alternative trading partners. Donor-year and recipient-year FE absorb these time-varying outward and inward multilateral resistance terms, respectively, alongside other donor- and recipient-specific factors that vary over time.

A related concern in assessing the association between ODA and trade is potential endogeneity. This can arise through reverse causality, for example if donors provide more ODA to countries with which they already have strong or growing commercial relationships, or through omitted or unobservable factors, such as strategic interests or changes in recipient country political and economic conditions, that may jointly influence aid allocations and trade.

The gravity controls and PTA indicator account for observable bilateral determinants of trade, while donor-year and recipient-year FE absorb time-varying donor- and recipient-specific factors that could otherwise be correlated with both ODA and exports. These controls substantially reduce the scope for omitted variable bias, although they do not fully

eliminate potential reverse causality or unobserved time-varying bilateral factors. Our empirical strategy therefore seeks to reduce these potential sources of endogeneity as far as possible within the structural gravity framework, but we do not claim that the estimated relationship between ODA and exports is causal. The results are consequently interpreted as conditional relationships between ODA and exports, rather than as identifying the causal effect of ODA on EU Member States' donor exports to recipient African countries.

An additional issue arises from the treatment of zero-ODA observations. Since the aid variables enter the model in logarithmic form and the logarithm of zero is undefined, using $\ln(ODA)$ directly would result in donor–recipient–year observations with zero ODA being dropped from the estimation. This could substantially reduce the estimation sample and, if zero-aid relationships are characteristically different from positive aid relationships, potentially introduce selection. The issue is particularly relevant for bilateral ODA. Across the full sample, allocated EU institutions' ODA contains 1,080 zero observations (3.7%), bilateral ODA contains 14,761 zeros (50.7%) and total ODA contains 876 zeros (3.0%).

To retain these observations, we follow Wagner (2003) and define the transformed aid variable as

$$\widehat{lnAid}_{ijt} = ln\left[max(1, Aid_{ijt})\right].$$

Following common practice in the literature (Calì and te Velde, 2011; Hühne et al., 2014; Hoekman and Shingal, 2024), we also include a separate no-aid indicator, $NoAid_{ijt}$, which equals 1 when $Aid_{ijt} = 0$ and zero otherwise. Equation (1) can therefore be written as:

$$E\left(X_{ijt}^{k} \mid Z_{ijt}\right) = exp\begin{bmatrix} \alpha\widehat{lnAid}_{ijt} + \rho NoAid_{ijt} + \beta_1 \, ln\, D\, istance_{ij} \\ +\beta_2 Legal_{ij} + \\ \beta_3 Language_{ij} + \beta_4 PTA_{ijt} + \delta_{it} + \delta_{jt} \end{bmatrix}. \qquad (2)$$

This treatment serves two purposes. First, it allows zero-ODA observations to remain in the estimation sample. Second, the $NoAid_{ijt}$ indicator distinguishes genuine zero-aid observations from positive aid values that are assigned a value of zero after the transformation. This distinction is relevant because the ODA variables are measured in millions of constant 2021 euros: both zero ODA and positive ODA below €1 million are assigned $ln\left[max(1, Aid_{ijt})\right] = 0$.

Equations (1) and (2) are estimated using the Poisson pseudo-maximum likelihood (PPML) estimator (Santos Silva and Tenreyro, 2006; Correia et al., 2020). This is particularly appropriate for bilateral trade data for two reasons. First, log-linear Ordinary Least Squares (OLS) specifications require strong assumptions about the error term and can produce biased estimates in the presence of heteroskedasticity, which is common in trade data because the variance of trade flows tends to increase with their magnitude. Second, bilateral

trade datasets frequently contain zero trade flows. PPML allows the dependent variable to enter the model in levels rather than logarithms and therefore retains zero export observations.

Standard errors are clustered at the donor–recipient pair level to account for potential correlation in the error terms within bilateral relationships over time. This is important because repeated observations for the same donor–recipient pair are unlikely to be independent across years. For example, unobserved bilateral factors affecting exports in one year may persist into subsequent years, leading to serial correlation in the error terms.

5 Empirical results

5.1 Development assistance and goods exports

Tables 1–3 examine the relationship between ODA (allocated EU institutions, bilateral and the sum of both (total)) and EU goods exports to African recipient countries. The results are consistently positive across the different measures of ODA and model specifications. As donor-year and recipient-year FE are introduced in the specifications, however, the estimated coefficients fall considerably. This suggests that part of the simple relationship between aid and donor exports reflects characteristics of donors and recipient markets that vary over time. The discussion therefore focuses on this preferred specification – that is, column 4 of each table.

For ease of interpretation, we report both the estimated elasticities and their monetary values. Since the dependent variable is specified in levels and ODA enters in logarithmic form, the monetary magnitude of the estimated relationship, evaluated at the sample means, is calculated as:

$$\textit{Monetary } Value = \beta \times \frac{\widehat{Export}}{\widehat{ODA}},$$

where β is the estimated ODA coefficient, $\widehat{Export}$ is mean donor exports and $\widehat{ODA}$ is mean ODA.

Mean goods exports across the goods exports sample are €94.89 million. This sample mean is used throughout the discussion below to translate the estimated elasticities into monetary magnitudes. This approach is used throughout the remainder of the analysis. These monetary estimates should be interpreted as economic magnitudes implied by the estimated relationships, rather than as causal returns to aid.

Table 1 EU institutions' ODA and goods exports to recipient African countries

	(1)	(2)	(3)	(4)
	Gravity + PTA	Donor-year FE	Recipient-year FE	Donor-year + recipient-year FE
EU ODA	0.738***	0.322***	1.004***	0.175*
	(0.063)	(0.067)	(0.057)	(0.091)
Bilateral distance	-0.396	-0.598**	-0.853***	-1.434***
	(0.253)	(0.247)	(0.156)	(0.215)
Common legal origin	1.005***	1.284***	0.793***	1.013***
	(0.189)	(0.236)	(0.153)	(0.134)
Common language	0.034	0.020	0.113	0.482***
	(0.182)	(0.252)	(0.118)	(0.163)
PTA	1.390***	1.574***	0.712***	0.382
	(0.229)	(0.235)	(0.269)	(0.333)
Constant	6.216***	8.903***	10.382***	17.226***
	(2.206)	(2.216)	(1.283)	(1.797)
Observations	29,120	28,860	29,120	28,860
Donor-year FE	No	Yes	No	Yes
Recipient-year FE	No	No	Yes	Yes

Standard errors in parentheses. * p<0.10, ** p<0.05, *** p<0.01. Standard errors are clustered by donor–recipient pair.

Notes: PPML estimates using the 2005–2024 sample. The dependent variable is bilateral goods exports, expressed in constant 2021 euros. EU ODA refers to EU institutions' ODA allocated across donors using their EU budget shares. It is expressed in constant 2021 euros and transformed as ln(max(1, ODA)). The zero-EU ODA indicator is not included because it is not separately identified in the preferred specification with donor-year and recipient-year FE. PTA denotes an active PTA. Bilateral distance is measured as the logarithm of the distance between each donor–recipient country pair. Common legal origin and common language are binary indicators equal to 1 when the country pair shares the respective characteristic, and zero otherwise.

For allocated EU institutions' ODA, the preferred estimate in Table 1 is positive and statistically significant at the 10% level. The coefficient is 0.175, implying that a 10% increase in allocated EU institutions' ODA is associated with an approximately 1.75% increase in goods exports. This relationship remains positive across all four specifications, although its magnitude falls considerably once donor-year and recipient-year FE are included.

The economic magnitude is also sizeable. Mean allocated EU institutions' ODA is €3.29 million per donor–recipient–year observation. Evaluated at the sample means, the preferred estimate implies that an additional €1 of allocated EU institutions' ODA is associated with approximately €5.05 in goods exports.[8]

[8] Calculated as: $0.175 * \left(\frac{94.89}{3.29}\right) = 5.05$.

Table 2 Bilateral ODA and goods exports to recipient African countries

	(1)	(2)	(3)	(4)
	Gravity + PTA	Donor-year FE	Recipient-year FE	Donor-year + recipient-year FE
Bilateral ODA	0.413***	0.255***	0.424***	0.118***
	(0.051)	(0.047)	(0.036)	(0.027)
Bilateral distance	-0.720***	-0.668***	-0.935***	-1.256***
	(0.190)	(0.217)	(0.190)	(0.197)
Common legal origin	0.434*	0.898***	0.306	0.885***
	(0.230)	(0.212)	(0.234)	(0.126)
Common language	-0.124	-0.163	0.005	0.402**
	(0.206)	(0.230)	(0.182)	(0.157)
PTA	1.630***	1.676***	0.765***	0.502
	(0.227)	(0.228)	(0.225)	(0.328)
Constant	9.627***	9.732***	12.354***	15.862***
	(1.661)	(1.932)	(1.561)	(1.643)
Observations	29,120	28,860	29,120	28,860
Donor-year FE	No	Yes	No	Yes
Recipient-year FE	No	No	Yes	Yes

Standard errors in parentheses. * p<0.10, ** p<0.05, *** p<0.01. Standard errors are clustered by donor–recipient pair.

Notes: PPML estimates using the 2005–2024 sample. The dependent variable is bilateral goods exports, expressed in constant 2021 euros. Bilateral ODA refers to ODA provided directly by an individual donor country to a recipient country. It is expressed in constant 2021 euros and transformed as ln(max(1, ODA)). All specifications include a zero-ODA indicator, but we do not report its coefficient. PTA denotes an active PTA. Bilateral distance is measured as the logarithm of the distance between each donor–recipient country pair. Common legal origin and common language are binary indicators equal to 1 when the country pair shares the respective characteristic, and zero otherwise.

Note that bilateral ODA refers to ODA provided directly by an individual EU Member State to a recipient country, excluding aid channelled through EU institutions or other multilateral organisations such as the UN. The results for bilateral ODA are similarly positive, though somewhat more modest in magnitude. In the preferred specification reported in Table 2, the coefficient stands at 0.118 and is statistically significant at the 1% level, implying that a 10% increase in bilateral ODA is associated with roughly a 1.18% rise in goods exports. As was the case for allocated EU institutions' ODA, the coefficient declines as the FE structure becomes more demanding, yet it retains its positive sign and statistical significance throughout. With mean bilateral ODA amounting to €9.00 million per donor–recipient–year observation, the same calculation yields economically noticeable results. Calculated at the sample means, the preferred estimate suggests that an additional €1 of bilateral ODA corresponds to approximately €1.24 in goods exports.

Table 3 Total ODA and goods exports to recipient African countries

	(1)	(2)	(3)	(4)
	Gravity + PTA	Donor-year FE	Recipient-year FE	Donor-year + recipient-year FE
Total ODA	0.603***	0.355***	0.643***	0.197***
	(0.048)	(0.056)	(0.032)	(0.044)
Bilateral distance	-0.643***	-0.624***	-1.098***	-1.334***
	(0.219)	(0.231)	(0.190)	(0.196)
Common legal origin	0.391*	0.967***	0.192	0.874***
	(0.229)	(0.221)	(0.225)	(0.125)
Common language	-0.100	-0.163	0.026	0.388**
	(0.209)	(0.235)	(0.168)	(0.151)
PTA	1.506***	1.610***	0.227	0.424
	(0.234)	(0.229)	(0.307)	(0.335)
Constant	8.096***	8.826***	13.003***	16.208***
	(1.938)	(2.106)	(1.592)	(1.649)
Observations	29,120	28,860	29,120	28,860
Donor-year FE	No	Yes	No	Yes
Recipient-year FE	No	No	Yes	Yes

Standard errors in parentheses. * p<0.10, ** p<0.05, *** p<0.01. Standard errors are clustered by donor–recipient pair.

Notes: PPML estimates using the 2005–2024 sample. The dependent variable is bilateral goods exports, expressed in constant 2021 euros. Total ODA refers to the total ODA received by a recipient, including bilateral donors and EU institutions. It is expressed in constant 2021 euros and transformed as ln(max(1, ODA)). All specifications include a zero-ODA indicator, but we do not report its coefficient. PTA denotes an active PTA. Bilateral distance is measured as the logarithm of the distance between each donor–recipient country pair. Common legal origin and common language are binary indicators equal to 1 when the country pair shares the respective characteristic, and zero otherwise.

The results for total ODA provide the strongest association in the preferred specifications. In Table 3, the coefficient on total ODA is 0.197 and statistically significant at the 1% level. This implies a 10% increase in total ODA is associated with an approximately 1.97% increase in goods exports. The relationship is positive and statistically significant across all four specifications, although its magnitude again falls once donor-year and recipient-year fixed effects are included simultaneously. Mean total ODA is €12.29 million per donor–recipient–year observation. Thus, the preferred estimate implies that an additional €1 of total ODA is associated with approximately €1.52 in goods exports.

Also, in all tables, as confirmed by previous studies (Anderson and Yotov, 2010; Yotov et al., 2016), the gravity controls broadly conform to expectations. In the preferred specifications, greater bilateral distance is associated with significantly lower goods exports, while sharing a common legal origin or language is associated with more trade. PTAs are positively associated with exports in the simpler specifications, but their coefficients cease to be statistically significant once both donor-year and recipient-year FE are included.

5.2 Development assistance and services exports

Tables 4 through 6 provide results on the relationship between ODA and services exports from EU donors to African recipients, distinguishing between total services and the various disaggregated categories. As in the goods regressions, our preferred specifications incorporate both donor-year and recipient-year FE. The introduction of these controls generally reduces the coefficient estimates, yet a positive and statistically significant association persists for the majority of services categories. Within the services sample, mean export values stand at €43.10 million for total services, €41.73 million for commercial services, €22.33 million for other commercial services, €18.73 million for modern services and €21.69 million for traditional services. On the aid side, mean allocated EU institutions' ODA amounts to €3.41 million, compared with €9.14 million for bilateral ODA and €12.55 million for total ODA. These sample means serve as the basis for translating the estimated elasticities reported in Tables 4–6 into monetary equivalents, following the same approach previously applied to the goods results.

Considering allocated EU institutions' ODA, the preferred estimates in Table 4 reveal a positive and statistically significant relationship with total services, commercial services, other commercial services and modern services. The coefficient for total services stands at 0.141, implying that a 10% increase in allocated EU institutions' ODA is associated with a 1.41% rise in total services exports. The corresponding estimates for commercial services, other commercial services and modern services are 0.144, 0.199 and 0.206, respectively, translating into increases of approximately 1.44%, 1.99%, and 2.06%. In contrast, the coefficient for traditional services is modest at 0.026 and fails to attain statistical significance. These elasticities translate into economically meaningful magnitudes when evaluated at the sample means. An additional €1 of allocated EU institutions' ODA corresponds to roughly €1.78 in total services exports, €1.76 in commercial services, €1.30 in other commercial services and €1.13 in modern services. Taken together, these findings suggest that the positive association with allocated EU institutions' ODA is more pronounced for commercial and modern services activities than for traditional services, where the relationship appears comparatively weak.

Table 4 EU Institutions' ODA and services exports to recipient African countries

	(1)	(2)	(3)	(4)	(5)	(6)	(7)	(8)	(9)	(10)
	Total services		Commercial services		Other commercial services		Modern services		Traditional services	
EU ODA	0.492***	0.141***	0.491***	0.144***	0.487***	0.199***	0.524***	0.206***	0.466***	0.026
	(0.037)	(0.051)	(0.037)	(0.052)	(0.046)	(0.051)	(0.045)	(0.048)	(0.035)	(0.067)
Bilateral distance	0.214	-0.973***	0.229	-0.992***	0.634***	-0.769***	0.781***	-0.791***	-0.167	-0.977***
	(0.161)	(0.160)	(0.163)	(0.162)	(0.173)	(0.198)	(0.184)	(0.191)	(0.158)	(0.179)
Common legal origin	1.332***	0.704***	1.359***	0.717***	1.564***	0.709***	1.488***	0.555***	1.257***	0.803***
	(0.209)	(0.099)	(0.209)	(0.101)	(0.258)	(0.127)	(0.279)	(0.132)	(0.200)	(0.120)
Common language	0.450***	0.409***	0.440***	0.404***	0.261	0.316***	0.255	0.279**	0.610***	0.553***
	(0.148)	(0.087)	(0.148)	(0.089)	(0.199)	(0.110)	(0.213)	(0.112)	(0.139)	(0.106)
PTA	1.035***	-0.249	1.047***	-0.225	0.973***	-0.356	1.109***	-0.153	0.886***	-0.122
	(0.173)	(0.182)	(0.174)	(0.179)	(0.203)	(0.247)	(0.219)	(0.265)	(0.166)	(0.152)
Constant	0.912	13.131***	0.745	13.268***	-3.266**	11.170***	-4.795***	11.275***	3.473**	12.269***
	(1.403)	(1.367)	(1.422)	(1.386)	(1.494)	(1.723)	(1.596)	(1.667)	(1.375)	(1.507)
Observations	27,440	27,440	27,440	27,440	27,440	27,440	27,440	27,440	27,440	27,440
Donor-year FE	No	Yes	No	Yes	No	Yes	No	Yes	No	Yes
Recipient-year FE	No	Yes	No	Yes	No	Yes	No	Yes	No	Yes

Standard errors in parentheses. * p<0.10, ** p<0.05, *** p<0.01. Standard errors are clustered by donor–recipient pair.

Notes: PPML estimates using the 2005–2024 sample. The dependent variables are bilateral services exports, expressed in constant 2021 euros. EU ODA refers to EU institutions' ODA allocated across donors using their EU budget shares. It is expressed in constant 2021 euros and has been log-transformed. All specifications include a zero-ODA indicator, but its coefficient is not reported. Total services comprise all services categories (SA–SL). Commercial services exclude government services (SA–SK). Other commercial services comprise construction through personal, cultural and recreational services (SE–SK). Modern services comprise insurance and pension services; financial services; intellectual property services; telecommunications, computer and information services; and other business services (SF–SJ). Traditional services comprise transport; travel; construction; and personal, cultural and recreational services (SC+SD+SE+SK). Bilateral distance is measured as the logarithm of the distance between each donor–recipient country pair. Common legal origin and common language are binary indicators equal to 1 when the country pair shares the respective characteristic, and zero otherwise. PTA denotes an active PTA.

Table 5 Bilateral ODA and services exports to recipient African countries

	(1)	(2)	(3)	(4)	(5)	(6)	(7)	(8)	(9)	(10)
	Total services		Commercial services		Other commercial services		Modern services		Traditional services	
Bilateral ODA	0.349***	0.078***	0.347***	0.078***	0.300***	0.056*	0.306***	0.046	0.380***	0.115***
	(0.036)	(0.022)	(0.037)	(0.023)	(0.046)	(0.032)	(0.050)	(0.033)	(0.032)	(0.021)
Bilateral distance	-0.031	-0.903***	-0.015	-0.921***	0.382**	-0.707***	0.498***	-0.734***	-0.388***	-0.888***
	(0.149)	(0.151)	(0.151)	(0.153)	(0.167)	(0.196)	(0.182)	(0.189)	(0.141)	(0.163)
Common legal origin	0.808***	0.618***	0.838***	0.632***	1.135***	0.665***	1.072***	0.528***	0.653***	0.664***
	(0.221)	(0.102)	(0.221)	(0.104)	(0.275)	(0.125)	(0.303)	(0.132)	(0.193)	(0.124)
Common language	0.264*	0.311***	0.255*	0.304***	0.077	0.204*	0.076	0.181	0.420***	0.430***
	(0.152)	(0.086)	(0.153)	(0.088)	(0.204)	(0.106)	(0.221)	(0.111)	(0.143)	(0.103)
PTA	1.246***	-0.109	1.258***	-0.084	1.190***	-0.178	1.339***	0.009	1.077***	-0.109
	(0.178)	(0.154)	(0.180)	(0.151)	(0.210)	(0.218)	(0.226)	(0.241)	(0.169)	(0.145)
Constant	3.231**	12.658***	3.052**	12.785***	-0.782	10.884***	-2.008	11.074***	5.477***	11.455***
	(1.298)	(1.296)	(1.313)	(1.316)	(1.429)	(1.711)	(1.574)	(1.663)	(1.224)	(1.372)
Observations	27,440	27,440	27,440	27,440	27,440	27,440	27,440	27,440	27,440	27,440
Donor-year FE	No	Yes	No	Yes	No	Yes	No	Yes	No	Yes
Recipient-year FE	No	Yes	No	Yes	No	Yes	No	Yes	No	Yes

Standard errors in parentheses. * p<0.10, ** p<0.05, *** p<0.01. Standard errors are clustered by donor–recipient pair.

Notes: PPML estimates using the 2005–2024 sample. The dependent variables are bilateral services exports, expressed in constant 2021 euros. Bilateral ODA refers to ODA provided directly by an individual donor country to a recipient country. It is expressed in constant 2021 euros and has been log-transformed. All specifications include a zero-ODA indicator, but its coefficient is not reported. Total services comprise all services categories (SA–SL). Commercial services exclude government services (SA–SK). Other commercial services comprise construction through personal, cultural and recreational services (SE–SK). Modern services comprise insurance and pension services; financial services; intellectual property services; telecommunications, computer and information services; and other business services (SF–SJ). Traditional services comprise transport; travel; construction; and personal, cultural and recreational services (SC+SD+SE+SK). Bilateral distance is measured as the logarithm of the distance between each donor–recipient country pair. Common legal origin and common language are binary indicators equal to 1 when the country pair shares the respective characteristic, and zero otherwise. PTA denotes an active PTA.

Table 6 Total ODA and services exports to recipient African countries

	(1)	(2)	(3)	(4)	(5)	(6)	(7)	(8)	(9)	(10)
	Total services		Commercial services		Other commercial services		Modern services		Traditional services	
Total ODA	0.507***	0.127***	0.506***	0.127***	0.479***	0.106**	0.494***	0.083*	0.517***	0.185***
	(0.032)	(0.030)	(0.033)	(0.031)	(0.040)	(0.044)	(0.043)	(0.045)	(0.030)	(0.028)
Bilateral distance	0.066	-0.965***	0.083	-0.985***	0.491***	-0.784***	0.619***	-0.806***	-0.308**	-0.938***
	(0.163)	(0.151)	(0.165)	(0.153)	(0.178)	(0.195)	(0.193)	(0.189)	(0.156)	(0.160)
Common legal origin	0.789***	0.594***	0.819***	0.607***	1.086***	0.622***	1.017***	0.494***	0.666***	0.637***
	(0.224)	(0.100)	(0.224)	(0.103)	(0.283)	(0.127)	(0.312)	(0.134)	(0.195)	(0.118)
Common language	0.309**	0.336***	0.300*	0.330***	0.132	0.250**	0.129	0.230**	0.456***	0.435***
	(0.152)	(0.086)	(0.153)	(0.088)	(0.203)	(0.110)	(0.219)	(0.115)	(0.146)	(0.103)
PTA	1.165***	-0.133	1.177***	-0.107	1.125***	-0.188	1.275***	0.012	0.980***	-0.162
	(0.184)	(0.160)	(0.185)	(0.157)	(0.215)	(0.225)	(0.230)	(0.244)	(0.173)	(0.157)
Constant	1.653	12.973***	1.469	13.109***	-2.521	11.330***	-3.883**	11.513***	4.114***	11.601***
	(1.430)	(1.305)	(1.446)	(1.323)	(1.543)	(1.711)	(1.682)	(1.675)	(1.364)	(1.350)
Observations	27,440	27,440	27,440	27,440	27,440	27,440	27,440	27,440	27,440	27,440
Donor-year FE	No	Yes	No	Yes	No	Yes	No	Yes	No	Yes
Recipient-year FE	No	Yes	No	Yes	No	Yes	No	Yes	No	Yes

Standard errors in parentheses. * p<0.10, ** p<0.05, *** p<0.01. Standard errors are clustered by donor–recipient pair.

Notes: PPML estimates using the 2005–2024 sample. The dependent variables are bilateral services exports, expressed in constant 2021 euros. Total ODA refers to the total ODA received by a recipient, including bilateral donors and EU institutions. It is expressed in constant 2021 euros and has been log-transformed. All specifications include a zero-ODA indicator, but its coefficient is not reported. Total services comprise all services categories (SA–SL). Commercial services exclude government services (SA–SK). Other commercial services comprise construction through personal, cultural and recreational services (SE–SK). Modern services comprise insurance and pension services; financial services; intellectual property services; telecommunications, computer and information services; and other business services (SF–SJ). Traditional services comprise transport; travel; construction; and personal, cultural and recreational services (SC+SD+SE+SK). Bilateral distance is measured as the logarithm of the distance between each donor–recipient country pair. Common legal origin and common language are binary indicators equal to 1 when the country pair shares the respective characteristic, and zero otherwise. PTA denotes an active PTA.

The results for bilateral ODA are positive but generally smaller in magnitude. In the preferred specifications in Table 5, the coefficient is 0.078 for both total and commercial services, implying that a 10% increase in bilateral ODA is correlated with an approximately 0.78% increase in each. The coefficient for other commercial services is 0.056 and statistically significant at the 10% level, while the estimate for modern services, 0.046, is not statistically significant. In contrast, bilateral ODA has a stronger association with traditional services: the coefficient of 0.115 is statistically significant at the 1% level, implying that a 10% increase in bilateral ODA is associated with an approximately 1.15% increase in traditional services exports.

In monetary terms, the preferred bilateral ODA estimates imply that an additional €1 of bilateral ODA leads to approximately €0.37 in total services exports, €0.36 in commercial services exports, €0.14 in other commercial services exports and €0.27 in traditional services exports.

Across the preferred specifications reported in Table 6, total ODA enters positively and significantly for all five services measures. In elasticity terms, a 10% increase in total ODA is associated with a rise of approximately 1.27% in total services exports and in commercial services alike, 1.06% in other commercial services, 0.83% in modern services and 1.85% in traditional services. The statistical reliability of these estimates varies, however: the coefficients for total, commercial and traditional services are significant at the 1% level, that for other commercial services at 5% and that for modern services at the 10% threshold. Evaluated at the sample means, these elasticities imply economically meaningful magnitudes. An additional €1 of total ODA corresponds, on average, to an increase of roughly €0.44 in total services exports, €0.42 in commercial services, €0.19 in other commercial services, €0.12 in modern services and €0.32 in traditional services.

Taken together, these findings suggest that the positive ODA–export nexus extends well beyond the goods sector to encompass a broad range of services categories. At the same time, the results make clear that the strength of this relationship is not uniform; it varies appreciably across both services types and the particular ODA measure employed.

6 Robustness analysis

6.1 Heterogeneity in the aid–goods export relationship: major donors versus other donors

As a robustness check, we examine whether the baseline relationship between ODA and donor goods exports is driven by the largest aid providers. Donor heterogeneity is well established in the aid literature: donors differ in their motivations, geographical and sectoral priorities, programme design and implementation, and the extent to which development, foreign policy and commercial objectives overlap (Brazys, 2013). Recent evidence also points to sizeable differences in the trade effects of aid across European donors (Martínez-Zarzoso and Lessing, 2026). We therefore split donors into the five largest providers and all other donors, identifying the top five separately for each ODA measure on the basis of cumulative flows over 2005–2024.

Aid provision is relatively concentrated. Germany, France, Italy, the UK and Spain account for 69.34% of allocated EU institutions' ODA. France, Germany, the UK, Sweden and the Netherlands account for 78.36% of bilateral ODA, while France, Germany, the UK, Italy and Sweden account for 73.10% of total ODA. This concentration makes it useful to establish whether the baseline findings are disproportionately driven by these major donors.

Appendices 3–4 contain results tables that show that this is not generally the case. For allocated EU institutions' ODA, the coefficients are positive and statistically significant for both groups before the full set of FE is introduced. Under the preferred specification with donor-year and recipient-year FE, however, the coefficients fall to 0.590 for the top five donors and 0.161 for other donors, and neither is statistically significant. The relationship between allocated EU institutions' ODA and goods exports is therefore less robust when the sample is split by donor size.

The results are stronger for bilateral ODA. Under the preferred specification, the coefficient is 0.078 for the top five donors and 0.122 for other donors, significant at the 5% and 1% levels, respectively. A 10% increase in bilateral ODA is therefore associated with an approximately 0.78% increase in goods exports among the top five donors and a 1.22% increase among other donors. Using the respective group means, the monetary equivalents are approximately €0.55 and €2.83 in goods exports for each additional €1 of bilateral ODA, respectively.

A similar pattern emerges for total ODA. The preferred coefficients are 0.093 for the top five donors and 0.268 for other donors, significant at the 5% and 1% levels, respectively. A 10% increase in total ODA is thus associated with an approximately 0.93% increase in goods exports among the largest donors and a 2.68% increase among other donors. Evaluated at the respective group means, these estimates correspond to approximately €0.54 and €3.44 in goods exports per additional €1 of total ODA.

Overall, the results suggest that the positive relationship between ODA and donor goods exports is not driven by the largest aid providers. For bilateral and total ODA, the relationship remains significant for both groups and is stronger among other donors, providing reassurance that the baseline findings reflect a broader aid–trade relationship.

6.2 Heterogeneity in the aid–goods export relationship: recipient governance quality

As a further robustness check, we examine whether the relationship between ODA and donor goods exports varies with government effectiveness in recipient countries. Recipient institutions can influence how effectively aid is implemented and translated into economic activity and trade. For example, Tadesse et al. (2019) find that institutional quality conditions the ability of AfT to reduce bilateral trade costs, while Brazys (2013) highlights the importance of programme design and institutional constraints. However, the relationship could work in either direction: stronger institutions may make aid more effective, while aid may have greater scope to address constraints in countries with weaker institutions. We therefore examine both groups without assuming in advance where the relationship will be stronger.

The results are reported in Appendices 6–9. Recipients are divided annually into high- and low-governance groups using the median Government Effectiveness score. The results provide only limited evidence that governance materially alters the baseline relationship. For allocated EU institutions' ODA, the coefficients are large and significant in the specifications without the full FE, but fall to 0.089 and 0.061 for high- and low-governance recipients, respectively, and become statistically insignificant once donor-year and recipient-year FE are included.

Bilateral ODA, by contrast, remains positively associated with goods exports in both governance groups. The preferred coefficients are 0.101 for high-governance recipients and 0.090 for low-governance recipients, significant at the 1% and 5% levels, respectively. Thus, a 10% increase in bilateral ODA is associated with an approximately 1.01% increase in goods exports to high-governance recipients and a 0.90% increase to low-governance recipients. The similarity of these estimates suggests little evidence of a pronounced governance effect. Assessed at the subgroup means, the corresponding

monetary associations are approximately €1.38 and €0.59 of goods exports per additional €1 of bilateral ODA, respectively.

For total ODA, the preferred coefficients are 0.200 and 0.165 for high- and low-governance recipients, both significant at the 1% level. A 10% increase in total ODA is therefore associated with an approximately 2.00% and 1.65% increase in goods exports, respectively. At the subgroup means, these correspond to approximately €1.96 of additional goods exports per €1 of total ODA for high-governance recipients and €0.82 for low-governance recipients.

Overall, the results suggest that the positive relationship between ODA and donor goods exports is reasonably robust across different governance environments, particularly for bilateral and total ODA.

6.3 Heterogeneity in the aid–services export relationship: major donors versus other donors

The tables in Appendices 9–11 provide a further check on whether the services results are concentrated among the largest aid providers. Donors are ranked separately for each ODA measure using cumulative flows over 2005–2024. The five largest donors account for 69.34% of allocated EU institutions' ODA, 77.94% of bilateral ODA and 72.65% of total ODA in the services sample.

For allocated EU institutions' ODA, the results remain positive across most services categories in both donor subgroups. Among the top five donors, a 10% increase in ODA is associated with rises of approximately 1.47% in total services, 1.46% in commercial services, 1.57% in other commercial services and 1.64% in modern services; the estimate for traditional services, however, fails to reach statistical significance. The corresponding effects are considerably larger among the remaining donors, at 2.98%, 3.08%, 5.09%, 5.61% and 1.87%, respectively. Evaluated at the respective subgroup means, these elasticities translate into meaningful differences in economic magnitude. An additional €1 of ODA is associated with approximately €1.65 in total services exports among the top five donors, compared with a substantially larger €4.70 among the other donors.

A similar finding emerges for bilateral ODA. Among the top five donors, the relationship is positive and statistically significant for total, commercial and traditional services, with coefficients of 0.078, 0.078 and 0.107, respectively. The estimates for other commercial and modern services, by contrast, do not attain statistical significance. For the remaining donors, however, bilateral ODA is positively and significantly associated with all five services categories, with coefficients ranging from 0.165 to 0.221. Translated into monetary terms at the subgroup means, these estimates imply that an additional €1 of bilateral ODA is associated with roughly €0.29 in total services exports among the top five donors, compared with a markedly higher €1.33 among the rest.

The total ODA results tell much the same story. Among the top five donors, the coefficients are positive and significant for total services (0.144), commercial services (0.140) and traditional services (0.186), but not for other commercial or modern services. Among other donors, the relationship is positive and significant across all five categories, with coefficients ranging from 0.237 to 0.302. The implied monetary association for total services is approximately €0.39 per additional €1 of total ODA among the top five donors, compared with €1.25 among other donors.

Taken together, these checks indicate that the services results are not being driven by the largest aid providers. In fact, the relationship is generally broader and stronger among the remaining donors, particularly for other commercial and modern services. This supports the view that the baseline aid–services relationship extends beyond a small group of dominant European donors.

6.4 Heterogeneity in the aid–services export relationship: recipient governance quality

The services results reported in Appendices 12–14 suggest that recipient governance does not necessarily shape the aid–services export relationship in a simple or uniform way. As in the goods analysis, recipients are split each year according to whether their Government Effectiveness score lies above or below the sample median. What emerges is a pattern that differs across ODA channels and services categories rather than a clear advantage for either governance group.

The most pronounced disparity, however, concerns allocated EU institutions' ODA. Among low-governance recipients, a 10% increase in ODA is associated with a rise of approximately 1.90% in total services exports and 1.94% in commercial services exports. The corresponding estimates for high-governance recipients are smaller in magnitude and fail to achieve statistical significance. This same broad pattern extends to other commercial and modern services: the estimated increases stand at 2.77% versus 1.50% for other commercial services, and 2.54% versus 1.58% for modern services. For traditional services, no statistically significant relationship emerges in either group.

Evaluated at the subgroup means, these estimates imply economically meaningful differences. Among low-governance recipients, an additional €1 of ODA corresponds to roughly €2.03 in other commercial services exports and €1.47 in modern services exports; the comparable figures for high-governance recipients are considerably lower, at approximately €0.91 and €0.84, respectively.

For bilateral ODA, the differences between the two groups are much narrower. A 10% increase in bilateral ODA is associated with approximately a 0.82% increase in total services exports in the high-governance group and 0.73% in the low-governance group.

Commercial and other commercial services show similarly close estimates. Modern services are significant only among high-governance recipients, while traditional services display a somewhat stronger relationship in the low-governance group. At the subgroup means, the estimates for total services imply around €0.41 and €0.32 in additional exports per additional €1 of bilateral ODA, respectively.

The results for total ODA are likewise fairly evenly balanced across governance groups. The coefficient for total services implies an increase of approximately 1.32% among high-governance recipients and 1.17% among low-governance recipients following a 10% rise in ODA. Differences are also modest for commercial, other commercial, and modern services, while traditional services appear somewhat more responsive in the low-governance group. In monetary terms, the implied association for total services amounts to roughly €0.46 per additional €1 of total ODA in the high-governance group and €0.39 in the low-governance group.

Taken together, these findings do not support the view that stronger recipient governance systematically enhances the ODA–services export relationship. Bilateral and total ODA yield broadly comparable estimates across the two groups, while allocated EU institutions' ODA is, if anything, more strongly associated with several services categories in lower-governance countries. This pattern may reflect greater scope for aid to alleviate binding institutional or infrastructural constraints where they are initially more acute, although we do not directly identify that mechanism here. As with the goods results, differences across subsamples should therefore be interpreted as suggestive rather than as statistically established distinctions between groups.

7 Conclusions and recommendations

Taken together, the results provide consistent evidence of a positive association between European ODA and donor exports to African recipients over 2005–2024. This relationship extends across goods and services and across allocated EU institutions' ODA, bilateral ODA and total ODA, although its magnitude varies by ODA channel and export category. The findings are consistent with the broader donor-export literature (Wagner, 2003; Martínez-Zarzoso and Lessing, 2026; Martínez-Zarzoso et al., 2009, 2014, 2017a, 2017b), while extending it in several important respects.

Our analysis most directly complements Hoekman and Shingal (2024), who examine AfT over 2002–2018 across a broad sample of developing countries. They find that bilateral AfT from EU Member States is positively associated with donor goods and services exports, while EU institutions' AfT is more closely associated with recipient exports. Our analysis differs in four main ways. First, it focuses specifically on EU trade with African recipients. Second, the sample extends to 2024, capturing more recent changes in EU–Africa economic relations. Third, we examine overall ODA rather than AfT alone, testing whether the donor–export relationship extends beyond assistance explicitly targeted at trade. Fourth, we provide greater disaggregation of services and systematically examine heterogeneity across major and other donors and across recipient governance environments. Methodologically, we also use PPML estimation while using donor-year and recipient-year FE to absorb a wide range of time-varying donor- and recipient-specific factors.

Our findings both support and extend those of Hoekman and Shingal (2024). Bilateral assistance remains positively associated with donor exports, but our results show that the relationship is not confined to bilateral aid. Allocated EU institutions' ODA is also positively associated with European exports to African recipients. This contrasts with their finding that EU institutions' AfT does not significantly increase donor exports. The difference may partly reflect our focus on Africa and, importantly, our use of overall ODA rather than AfT. It suggests that collectively financed EU development assistance can be associated with commercial benefits for contributing European economies even when such assistance is not explicitly trade related. This should not be interpreted as evidence that EU aid allocation is commercially motivated.

For goods, the relationship remains positive after introducing donor-year and recipient-year FE, although the estimated coefficients fall substantially. In the preferred specifications, a 10% increase in allocated EU institutions' ODA, bilateral ODA and total ODA is associated with approximately 1.7%, 1.2% and 2.0% higher donor goods exports, respectively. At the sample means, these correspond to approximately €5.05, €1.24 and €1.52 of additional goods exports per additional €1 of ODA. The reduction of the coefficients after introducing the FE is itself informative, indicating that part of the unconditional aid–trade relationship reflects changing donor and recipient characteristics.

The services results show that this relationship extends beyond merchandise trade. Allocated EU institutions' ODA is positively associated with total and commercial services, with particularly strong elasticities for other commercial and modern services. Bilateral ODA produces smaller but generally positive estimates, while total ODA is positively associated with all five services aggregates. For total services, the implied monetary magnitudes are approximately €1.78, €0.37 and €0.44 per additional €1 of allocated EU institutions' ODA, bilateral ODA and total ODA, respectively. The relatively strong elasticities for modern services are noteworthy, suggesting that the commercial association extends to financial, digital, professional and other knowledge-intensive services rather than being confined to conventional goods trade.

Several mechanisms could generate these patterns. ODA may directly create demand for donor goods and services, but it may also operate indirectly by expanding recipient income and import capacity, improving infrastructure and productive capabilities, reducing trade costs and information barriers, and strengthening longer-term commercial relationships. The analysis does not identify these channels separately, so the results should be interpreted as evidence of the overall aid–export relationship rather than of a specific transmission mechanism.

The heterogeneity results add an important dimension. The baseline findings are not driven by a small group of dominant European donors. For bilateral and total ODA, positive goods export relationships remain among both the five largest donors and other donors, and the estimates are often larger for the latter. The services results are even more pronounced, with broader and generally stronger associations among other donors. This extends Hoekman and Shingal's donor group analysis, which focuses primarily on EU15/EU13, France/UK and Nordic groupings, and provides more direct evidence that donor heterogeneity matters.

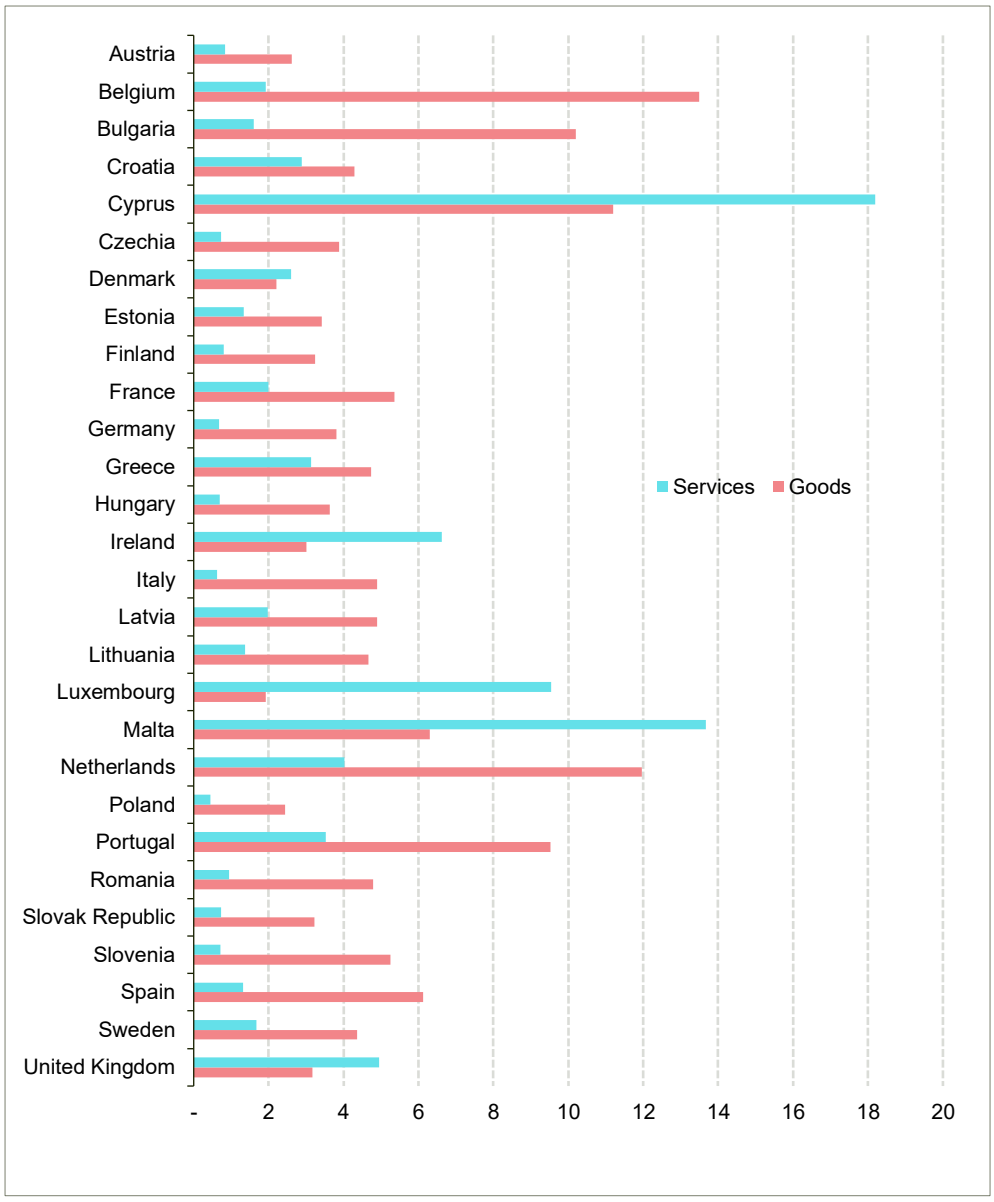
Nor is there a simple relationship between government effectiveness and the ODA–export association. Bilateral and total ODA remain positively associated with goods exports across both higher- and lower-government effectiveness recipients, while their services

elasticities are also broadly similar across the two groups. Allocated EU institutions' ODA is, if anything, more strongly associated with several services categories among lower-governance recipients. This suggests that the ODA–export relationship is not conditional on recipients crossing a straightforward institutional quality threshold. Aid may also have greater scope to relax binding infrastructure or institutional constraints where these are initially more severe, although this mechanism cannot be established from the present estimates.

The central policy implication is therefore one of complementarity rather than trade-off between development cooperation and European commercial interests. Our results do not imply that ODA should be allocated with a view to promoting European exports; nor do they provide a rationale for tied aid. Rather, ODA that strengthens productive capacity, infrastructure, institutions and markets can simultaneously deepen economic relationships from which European firms may stand to benefit. In this respect, our findings refine the distinction drawn by Hoekman and Shingal (2024) between bilateral assistance associated with national commercial interests and pooled EU assistance. Commercial benefits can arise from collectively financed development cooperation without commercial objectives determining its allocation. The important distinction, therefore, lies not between aid that does or does not pursue commercial goals, but between commercial motivation and commercial outcomes.

This has particular relevance for the EU's developing economic partnership with Africa. Development cooperation, trade and investment objectives need not operate as separate policy areas: effective ODA can support African economic development while expanding markets and strengthening longer-term European commercial relationships. The results for modern services further suggest that this complementarity increasingly covers digital, financial, professional and other knowledge-intensive activities.

Figure 9 Impact of €1 of EU institutions' ODA by Member State exports (€)



A final caveat is worth noting. The euro-for-euro estimates should be viewed as illustrative economic magnitudes, evaluated at the sample means, rather than as financial returns to ODA.

References

Agarwal, P., Mendez-Parra, M., and te Velde, D.W. (2026) 'Impact of EU Development cooperation on the EU economy: Channels and case studies from Africa' ODI Global -rani

Anderson, J. E. and van Wincoop, E. (2003) 'Gravity with gravitas: a solution to the border puzzle'. *American Economic Review* 93(1): 170–192.

Anderson, J. E. and Yotov, Y. (2010) 'The changing incidence of geography'. *American Economic Review* 100(5): 2157–2186.

Ayele, Y., Mendez-Parra, M. and te Velde, D.W. (2025) "The Economic Impact of EU aid on EU economies" ODI Europe-Pandemic Action Network https://odi.org/en/publications/the-economic-impact-of-eu-aid-on-eu-economies/

Ayele, Y., Mendez-Parra, M. and te Velde, D.W. (2026) 'The Impact of EU development assistance on the EU economy: New model estimates 2026', rani

Bearce, D. H., Finkel, S. E., Pérez-Liñán, A. S. et al. (2013) 'Has the new Aid for Trade agenda been export effective? Evidence on the impact of US AfT allocations 1999–2008'. *International Studies Quarterly* 57(1): 163–170.

Brazys, S. (2013) 'Evidencing donor heterogeneity in Aid for Trade'. *Review of International Political Economy* 20(4): 947–978.

Brazys, S. and Lightfoot, S. (2016) 'Europeanisation in Aid for Trade: the impact of capacity and socialisation'. *European Politics and Society* 17(1): 120–135.

Cadot, O., Fernandes, A., Gourdon, J. et al. (2014) 'Evaluating Aid for Trade: a survey of recent studies'. *The World Economy* 37(4): 516–529.

Calì, M. and te Velde, D. W. (2011) 'Does Aid for Trade really improve trade performance?' *World Development* 39(5): 725–40.

Carbone, M. and Keijzer, N. (2016) 'The European Union and policy coherence for development: Reforms, results, resistance'. *The European Journal of Development Research* 28(1): 30–43.

Conte, M., Cotterlaz, P. and Mayer, T. (2023) 'The CEPII Gravity database'. Working Paper 2022–05 Paris: CEPII.

Correia, S., Guimarães, P. and Zylkin, T. (2020) 'Fast Poisson estimation with high-dimensional fixed effects'. *The Stata Journal* 20(1): 95–115.

Delputte, S., Lannoo, S., Orbie, J. and Verschaeve, J. (2016) 'Europeanisation of aid budgets: nothing is as it seems'. *European Politics and Society* 17(1): 74–89.

Dreher, A., Nunnenkamp, P. and Schmaljohann, M. (2015) 'The allocation of German aid: self-interest and government ideology'. *Economics & Politics* 27(1): 160–184.

Francois, J. and Hoekman, B. (2010) 'Services trade and policy'. *Journal of Economic Literature* 48(3): 642–692.

Ghani, S. E. and O'Connell, S. D. (2014) 'Can service be a growth escalator in low-income countries?' Scholarly Paper 2470231. Social Science Research Network.

Gulrajani, N. and Calleja, R. (2021) 'Interest-based development cooperation: moving providers from parochial convergence to principled collaboration'. In S. Chaturvedi, H. Janus, S. Klingebiel et al. (eds) *The Palgrave handbook of development cooperation for achieving the 2030 Agenda: contested collaboration*. Amsterdam: Springer International Publishing.

Gurevich, T. and Herman, P. (2018) 'The dynamic gravity dataset: 1948–2016'. Economics Working Paper 2018-02-A. Washington, DC: USITC.

Head, K. and Mayer, T. (2014) 'Gravity equations: workhorse, toolkit, and cookbook'. In G. Gopinath, E. Helpman and K. Rogoff (eds) *Handbook of international economics*. Vol. 4. Handbook of International Economics. Amsterdam: Elsevier.

Hoeffler, A. and Outram, V. (2011) 'Need, merit, or self-interest—what determines the allocation of aid?' *Review of Development Economics* 15(2): 237–250.

Hoekman, B. and Shingal, A. (2020) 'Aid for Trade and international transactions in goods and services'. *Review of International Economics* 28(2): 320–40.

Hoekman, B. and Shingal, A. (2021) 'Aid for Trade and trade in services'. *The Journal of Development Studies* 57(10): 1723–1738.

Hoekman, B. and Shingal, A. (2024) 'Development goals, commercial interest and EU Aid-for-Trade'. *World Development* 173: 106389 (https://doi.org/10.1016/j.worlddev.2023.106389).

Hühne, P., Meyer, B. and Nunnenkamp, P. (2014) 'Who benefits from aid for trade? Comparing the effects on recipient versus donor exports'. *The Journal of Development Studies* 50(9): 1275–1288.

Loungani, P., Mishra, S., Papageorgiou, C. and Wang, K. (2017) 'World trade in services: evidence from a new dataset'. Working Paper 2017/077. Washington, DC: IMF.

Martínez-Zarzoso, I. and Lessing, J. (2026) 'More than meets the port: donor export effects of foreign aid revisited'. Discussion Paper. Gottingen: IAI.

Martínez-Zarzoso, I., Nowak-Lehmann, F., Parra, M. D. and Klasen, S. (2014) 'Does aid promote donor exports? Commercial interest versus instrumental philanthropy'. *Kyklos* 67(4): 559–587.

Martínez-Zarzoso, I., Nowak-Lehmann, F., Klasen, S. and Larch, M. (2009) 'Does German development aid promote German exports?' *German Economic Review* 10(3): 317–338.

Martínez-Zarzoso, I., Nowak-Lehmann, F. and Klasen, S. (2017a) 'Aid and its impact on the donor's export industry: the Dutch case'. *The European Journal of Development Research* 29(4): 769–786.

Martínez-Zarzoso, I., Nowak-Lehmann, F. and Rehwald, K. (2017) 'Is Aid for Trade effective? A panel quantile regression approach'. *Review of Development Economics* 21(4): e175–203.

Meeks, P. and Craviotto, N. (2021) 'Strings still attached: unmet commitments on tied aid'. Eurodad, 18 November (www.eurodad.org/unmet_commitments_tied_aid).

Michaelowa, K., Reinsberg, B. and Schneider, C. (2017) 'Multi-bi aid in European development assistance: the role of capacity constraints and Member State politics'. *Development Policy Review* 35(4): 513–530.

Michaelowa, K., Reinsberg, B. and Schneider, C. (2018) 'The politics of double delegation in the European Union'. *International Studies Quarterly* 62(4): 821–833.

Mishra, S., Lundstrom, S. and Anand, R. (2011) 'Service export sophistication and economic growth'. Policy Research Working Paper 5606. Washington, DC: World Bank.

Nishitateno, S. and Umetani, H. (2023) 'Heterogeneous effects of aid-for-trade on donor exports: why is Japan different?' *Review of International Economics* 31(3): 1117–1145.

Nowak-Lehmann, F., Martínez-Zarzoso, I., Klasen, S. and Herzer, D. (2009) 'Aid and trade – a donor's perspective'. *The Journal of Development Studies* 45(7): 1184–202.

Orbie, J. and Carbone, M. (2016) 'The Europeanisation of development policy'. *European Politics and Society* 17(1): 1–11.

Santos Silva, J. M. C. and Tenreyro, S. (2006) 'The log of gravity'. *The Review of Economics and Statistics* 88(4): 641–658.

Suwa-Eisenmann, A. and Verdier, T. (2007) 'Aid and trade'. *Oxford Review of Economic Policy* 23(3): 481–507.

Tadesse, B., Shukralla, E. and Fayissa, B. (2019) 'Institutional quality and the effectiveness of Aid for Trade'. *Applied Economics* 51(39): 4233–4254.

UN ECLAC (United Nations Economic Commission for Latin America and the Caribbean) (2017) *International trade outlook for Latin America and the Caribbean: recovery in an uncertain context.* Santiago: UN ECLAC.

Vijil, M. and Wagner, L. (2012) 'Does aid for trade enhance export performance? Investigating the infrastructure channel'. *The World Economy* 35(7): 838–868.

Wagner, D. (2003) 'Aid and trade—an empirical study'. *Journal of the Japanese and International Economies* 17(2): 153–73.

World Bank and WTO (World Trade Organization) (2023) 'Trade in services for development - fostering sustainable growth and economic diversification'. Report 185136. Washington, DC, and Geneva: World Bank and WTO.

Yotov, Y. V., Piermartini, R., Monteiro, J.-A. and Larch, M. (2016) *An advanced guide to trade policy analysis: the structural gravity model*. Geneva: WTO.

Younas, J. (2008) 'Motivation for bilateral aid allocation: altruism or trade benefits'. *European Journal of Political Economy* 24(3): 661–674.

Appendix 1 Donor summary statistics

Donor	Average goods exports	Cumulative goods exports	Average services exports	Cumulative services exports	Average EU institutions' ODA	Cumulative EU institutions' ODA	Average bilateral ODA	Cumulative bilateral ODA	Average total ODA	Cumulative total ODA
Austria	32.8	34,138.2	13.1	12,823.3	2.2	2,319.8	2.5	2,622.9	4.8	4,942.7
Belgium	231.4	240,648.5	40.8	39,952.4	3.0	3,126.6	10.4	10,841.3	13.4	13,967.9
Bulgaria	17.5	18,240.2	3.4	3,338.4	0.3	348.2	0.0	6.7	0.3	354.9
Croatia	4.9	5,127.0	4.1	4,050.9	0.2	229.4	0.0	4.4	0.2	233.7
Cyprus	6.4	6,702.5	12.9	12,593.9	0.1	145.2	0.0	7.8	0.1	153.0
Czechia	26.6	27,649.1	6.2	6,076.2	1.2	1,292.9	0.2	195.9	1.4	1,488.8
Denmark	24.0	24,974.8	35.0	34,337.7	1.9	1,954.2	10.0	10,370.7	11.9	12,324.8
Estonia	3.9	4,016.1	1.9	1,890.9	0.2	162.1	0.0	13.3	0.2	175.4
Finland	27.7	28,812.1	8.6	8,427.7	1.5	1,588.3	3.1	3,209.8	4.6	4,798.1
France	499.9	519,854.9	230.9	226,286.1	16.3	16,909.6	69.1	71,904.1	85.4	88,813.7
Germany	418.8	435,508.5	92.8	90,939.2	19.2	19,983.7	53.7	55,847.3	72.9	75,831.0
Greece	37.9	39,372.4	31.1	30,507.3	1.4	1,497.2	0.2	159.3	1.6	1,656.5
Hungary	16.6	17,267.7	3.9	3,824.8	0.8	878.3	0.2	252.4	1.1	1,130.7
Ireland	25.8	26,811.6	70.4	68,991.7	1.5	1,573.1	5.4	5,651.8	6.9	7,224.9
Italy	336.0	349,488.0	53.6	52,524.6	12.0	12,460.6	8.7	9,007.2	20.6	21,467.8
Latvia	5.6	5,799.2	2.8	2,706.8	0.2	190.1	0.0	3.9	0.2	194.0
Lithuania	8.0	8,275.8	2.9	2,810.2	0.3	290.3	0.0	5.0	0.3	295.3
Luxembourg	3.3	3,389.4	20.3	19,860.9	0.3	281.6	2.3	2,410.3	2.6	2,691.8
Malta	3.6	3,791.2	9.7	9,480.4	0.1	71.6	0.0	13.9	0.1	85.5
Netherlands	259.7	270,058.7	108.4	106,273.6	3.8	3,989.4	12.9	13,368.9	16.7	17,358.3
Poland	43.1	44,778.0	9.8	9,610.5	3.1	3,269.1	0.5	478.5	3.6	3,747.6
Portugal	76.2	79,293.9	35.0	34,268.7	1.4	1,438.7	3.3	3,436.8	4.7	4,875.5
Romania	32.9	34,240.3	8.0	7,816.9	1.2	1,203.6	0.0	25.3	1.2	1,228.8
Slovak Republic	9.2	9,597.0	2.6	2,536.0	0.5	562.6	0.1	119.3	0.7	681.9

Donor	Average goods exports	Cumulative goods exports	Average services exports	Cumulative services exports	Average EU institutions' ODA	Cumulative EU institutions' ODA	Average bilateral ODA	Cumulative bilateral ODA	Average total ODA	Cumulative total ODA
Slovenia	9.0	9,386.8	1.5	1,486.3	0.3	310.8	0.0	38.2	0.3	349.1
Spain	283.2	294,549.7	75.9	74,420.3	8.1	8,468.5	7.5	7,838.1	15.7	16,306.6
Sweden	62.3	64,815.3	29.6	29,015.1	2.5	2,643.5	14.6	15,226.5	17.2	17,870.0
United Kingdom	150.5	156,519.0	291.6	285,803.8	8.3	8,603.7	47.1	48,962.4	55.4	57,566.2

Source: Authors' calculations based on OECD DAC data for ODA, Eurostat for bilateral goods exports and OECD–WTO BaTIS for bilateral services exports

Notes: The table reports average annual and cumulative goods and services exports, alongside average annual and cumulative ODA, by donor over 2005–2024. Goods and services exports refer to exports from each EU Member State and the UK to African recipient countries in the sample. EU institutions' ODA refers to EU-level ODA allocated to individual EU Member States according to their annual shares of contributions to the EU budget. Bilateral ODA refers to ODA provided directly by each donor country, while total ODA is the sum of bilateral ODA and allocated EU institutions' ODA. All monetary values are expressed in constant 2021 euros. Average values are annual averages over the study period, while cumulative values are sums over 2005–2024.

Appendix 2 Recipient summary statistics

Recipient	Average goods imports	Cumulative goods imports	Average services imports	Cumulative services imports	Average EU institutions' ODA received	Cumulative EU institutions' ODA received	Average bilateral ODA received	Cumulative bilateral ODA received	Average total ODA received	Cumulative total ODA received
Algeria	589.69	330,228.20	135.47	75,864.93	1.90	1,063.94	6.52	3,651.56	8.42	4,715.50
Angola	147.19	82,428.11	198.90	111,386.35	1.32	739.52	2.33	1,302.15	3.65	2,041.67
Benin	30.36	17,000.28	10.85	6,077.32	2.60	1,457.75	6.25	3,502.46	8.86	4,960.20
Botswana	14.32	8,018.55	12.38	6,934.26	0.55	309.07	0.89	495.95	1.44	805.02
Burkina Faso	21.70	12,154.35	12.39	6,939.31	5.07	2,838.50	10.32	5,778.12	15.39	8,616.62
Burundi	2.93	1,640.13	2.87	1,605.18	2.48	1,391.53	4.46	2,499.48	6.95	3,891.01
Cabo Verde	17.72	9,921.83	6.49	3,632.45	0.70	394.37	3.31	1,856.11	4.02	2,250.48
Cameroon	52.18	29,218.94			2.56	1,432.82	16.88	9,450.12	19.43	10,882.94
Central African Republic	3.69	2,065.34	2.92	1,637.64	2.68	1,501.07	3.44	1,923.74	6.12	3,424.82
Chad	8.68	4,858.26	16.12	9,028.10	3.93	2,201.32	4.03	2,255.81	7.96	4,457.13
Congo	36.51	20,446.53	57.08	31,966.09	0.84	469.76	7.73	4,327.55	8.57	4,797.30
Côte d'Ivoire	85.33	47,787.22	42.50	23,798.01	3.28	1,837.48	17.38	9,732.64	20.66	11,570.12
Dem Rep of the Congo	34.76	19,463.37	25.74	14,416.70	7.56	4,233.60	26.12	14,627.32	33.68	18,860.91
Djibouti	7.90	4,421.63	4.49	2,514.67	0.59	332.36	1.50	841.66	2.10	1,174.02
Egypt	593.87	332,569.14	211.47	118,425.62	15.42	8,636.76	17.03	9,535.80	32.45	18,172.56
Equatorial Guinea	18.42	10,317.50	19.37	10,848.17	0.04	19.65	0.46	256.23	0.49	275.88
Eritrea	2.24	1,256.25			0.70	390.99	0.48	271.19	1.18	662.18
Eswatini	1.30	725.54	6.53	3,659.34	0.67	374.84	0.11	63.69	0.78	438.53
Ethiopia	47.21	26,439.96	32.83	18,385.41	7.40	4,143.20	27.72	15,523.49	35.12	19,666.69
Gabon	36.25	20,297.69	40.28	22,559.09	0.27	150.22	2.59	1,453.03	2.86	1,603.25
Gambia	5.55	3,106.46	2.57	1,440.33	0.88	492.22	0.68	378.49	1.55	870.71
Ghana	96.23	53,890.66	63.90	35,781.98	2.53	1,417.15	11.88	6,650.29	14.41	8,067.44
Guinea	32.68	18,302.21	13.14	7,359.37	1.90	1,065.29	3.45	1,930.47	5.35	2,995.76
Guinea-Bissau	4.28	2,399.34	1.63	913.61	0.83	466.10	1.01	566.97	1.84	1,033.07
Kenya	61.93	34,679.51	49.30	27,606.02	4.53	2,536.64	18.13	10,155.43	22.66	12,692.07
Lesotho	0.45	249.98	1.42	797.80	0.72	404.70	0.47	265.86	1.20	670.56
Liberia	33.16	18,571.96	17.43	9,763.20	1.78	996.43	4.46	2,497.63	6.24	3,494.06

Recipient	Average goods imports	Cumulative goods imports	Average services imports	Cumulative services imports	Average EU institutions' ODA received	Cumulative EU institutions' ODA received	Average bilateral ODA received	Cumulative bilateral ODA received	Average total ODA received	Cumulative total ODA received
Libya	185.48	103,871.52	58.18	32,578.16	1.32	739.14	2.49	1,394.33	3.81	2,133.47
Madagascar	19.58	10,964.92	11.82	6,620.07	3.16	1,771.26	4.81	2,693.61	7.97	4,464.87
Malawi	4.75	2,658.42	3.82	2,138.91	3.34	1,871.48	6.74	3,776.54	10.09	5,648.02
Mali	30.75	17,220.11	15.41	8,631.98	5.31	2,974.67	11.48	6,429.82	16.79	9,404.49
Mauritania	30.08	16,847.34	11.32	6,336.74	1.75	978.16	2.58	1,445.54	4.33	2,423.69
Mauritius	33.17	18,572.65	46.43	26,002.97	1.22	684.95	2.43	1,362.50	3.66	2,047.45
Morocco	709.00	397,039.14	160.15	89,684.57	14.75	8,259.89	29.25	16,380.13	44.00	24,640.02
Mozambique	23.29	13,041.04	34.37	19,249.48	4.75	2,657.69	19.87	11,125.31	24.61	13,783.01
Namibia	16.20	9,074.59			0.66	366.88	2.87	1,608.39	3.53	1,975.28
Niger	11.68	6,543.36	9.79	5,481.69	5.35	2,998.09	7.80	4,366.52	13.15	7,364.60
Nigeria	386.30	216,330.23	231.23	129,487.89	4.53	2,538.57	40.38	22,610.42	44.91	25,148.99
Rwanda	7.52	4,209.60	6.79	3,802.73	2.77	1,550.82	9.20	5,150.87	11.97	6,701.69
Sao Tome and Principe	2.09	1,168.47	1.15	644.56	0.20	114.07	0.70	394.78	0.91	508.85
Senegal	101.53	56,859.27	29.83	16,707.33	3.13	1,751.42	12.42	6,956.19	15.55	8,707.62
Seychelles	9.25	5,179.30	10.43	5,840.26	0.12	64.84	0.14	77.33	0.25	142.17
Sierra Leone	7.95	4,450.12	6.33	3,546.95	2.23	1,251.01	5.50	3,081.57	7.74	4,332.58
Somalia	3.02	1,690.53	7.30	4,087.47	5.27	2,948.73	14.34	8,028.23	19.60	10,976.96
South Africa	810.07	453,637.45	325.08	182,043.75	4.82	2,697.77	14.78	8,276.24	19.60	10,974.01
Sudan	33.25	18,618.76	20.57	11,518.10	5.33	2,983.59	12.31	6,891.70	17.63	9,875.29
Tanzania	32.75	18,338.74	21.82	12,216.67	4.45	2,491.83	19.04	10,663.53	23.49	13,155.36
Togo	70.91	39,708.76	9.46	5,298.14	1.29	722.22	3.27	1,832.29	4.56	2,554.50
Tunisia	380.84	213,269.09	62.24	34,854.16	11.87	6,644.72	15.05	8,426.71	26.91	15,071.43
Uganda	18.26	10,223.95	18.21	10,198.82	4.36	2,439.95	15.00	8,398.16	19.35	10,838.11
Zambia	12.85	7,197.74	11.66	6,530.59	3.16	1,771.04	9.04	5,063.10	12.20	6,834.15
Zimbabwe	7.02	3,931.74	10.38	5,811.49	2.18	1,222.62	6.78	3,794.93	8.96	5,017.56

Source: Authors' calculations based on OECD DAC data for ODA, Eurostat for bilateral goods exports and OECD–WTO BaTIS for bilateral services exports

Notes: The table reports average annual and cumulative goods and services imported, alongside average annual and cumulative ODA, by African recipients from EU Member States over 2005–2024. Goods and services imported refer to exports from each EU Member State and the UK. EU institutions' ODA refers to EU-level ODA received by an African recipient. Bilateral ODA refers to ODA received directly from EU Member States, while total ODA is the sum of bilateral ODA and allocated EU institutions' ODA received. All monetary values are expressed in constant 2021 euros. Average values are annual averages over the study period, while cumulative values are sums over 2005–2024.

Appendix 3 EU Institutions' ODA and goods exports: major versus other donors

	(1) Top five donors	(2) Other donors	(3) Top five donors	(4) Other donors
EU ODA	0.379***	0.992***	0.590	0.161
	(0.095)	(0.085)	(0.384)	(0.118)
Bilateral distance	-0.597*	-0.166	-1.936***	-1.026***
	(0.329)	(0.224)	(0.253)	(0.227)
Common legal origin	0.861***	1.051**	0.717***	2.067***
	(0.150)	(0.457)	(0.110)	(0.313)
Common Language	-0.045	0.187	0.508***	0.284
	(0.218)	(0.198)	(0.160)	(0.181)
PTA	1.798***	0.946***	0.000	0.252
	(0.321)	(0.286)	(.)	(0.336)
Observations	5,200	23,920	4,940	23,920
Donor-year FE	No	No	Yes	Yes
Recipient-year FE	No	No	Yes	Yes

Standard errors in parentheses. * p<0.10, ** p<0.05, *** p<0.01. Standard errors are clustered by donor–recipient pair.

Notes: PPML estimates using the 2005–2024 sample. The dependent variable is bilateral goods exports, expressed in constant 2021 euros. EU ODA refers to EU institutions' ODA allocated across donors using their EU budget shares. It is expressed in constant 2021 euros and transformed as ln(max(1, ODA)). The top five donors by allocated EU ODA are Germany, France, Italy, the UK and Spain; together they account for 69.34% of allocated EU ODA in the sample. PTA denotes an active PTA and is included where identified and is omitted automatically when collinear with the fixed effects. Bilateral distance is measured as the logarithm of the distance between each donor–recipient country pair. Common legal origin and common language are binary indicators equal to 1 when the country pair shares the respective characteristic, and zero otherwise.

Appendix 4 Bilateral ODA and goods exports: major versus other donors

	(1) Top five donors	(2) Other donors	(3) Top five donors	(4) Other donors
Bilateral ODA	0.359***	0.391***	0.078**	0.122***
	(0.083)	(0.047)	(0.032)	(0.036)
Bilateral distance	-0.521	-0.918***	-2.508***	-0.943***
	(0.375)	(0.146)	(0.889)	(0.186)
Common legal Origin	0.603**	0.783***	0.426*	1.239***
	(0.276)	(0.254)	(0.231)	(0.195)
Common language	-0.512	0.255	0.720***	0.324*
	(0.362)	(0.194)	(0.264)	(0.182)
PTA	1.732***	1.587***	0.000	0.581*
	(0.349)	(0.221)	(.)	(0.318)
Observations	5,200	23,920	4,940	23,920
Donor-year FE	No	No	Yes	Yes
Recipient-year FE	No	No	Yes	Yes

Standard errors in parentheses. * p<0.10, ** p<0.05, *** p<0.01. Standard errors are clustered by donor–recipient pair.

Notes: PPML estimates using the 2005–2024 sample. The dependent variable is bilateral goods exports, expressed in constant 2021 euros. Bilateral ODA refers to ODA provided directly by an individual donor country to a recipient country. It is expressed in constant 2021 euros and transformed as ln(max(1, ODA)). All specifications include a zero-ODA indicator, but we do not report its coefficient. The top five bilateral ODA donors are France, Germany, the UK, Sweden and the Netherlands; together they account for 78.36% of bilateral ODA in the sample. PTA denotes an active PTA and is included where identified and is omitted automatically when collinear with the fixed effects. Bilateral distance is measured as the logarithm of the distance between each donor–recipient country pair. Common legal origin and common language are binary indicators equal to 1 when the country pair shares the respective characteristic, and zero otherwise.

Appendix 5 Total ODA and goods exports: major versus other donors

	(1) Top five donors	(2) Other donors	(3) Top five donors	(4) Other donors
Total ODA	0.421***	0.694***	0.093**	0.268***
	(0.100)	(0.041)	(0.046)	(0.049)
Bilateral distance	-0.668*	-0.593***	-1.787***	-0.897***
	(0.362)	(0.174)	(0.224)	(0.213)
Common legal Origin	0.283	0.735***	0.612***	1.483***
	(0.233)	(0.246)	(0.145)	(0.189)
Common language	0.014	-0.194	0.541***	0.212
	(0.213)	(0.205)	(0.174)	(0.189)
PTA	1.732***	1.371***	0.000	0.262
	(0.339)	(0.250)	(.)	(0.336)
Observations	5,200	23,920	4,940	23,920
Donor-year FE	No	No	Yes	Yes
Recipient-year FE	No	No	Yes	Yes

Standard errors in parentheses. * p<0.10, ** p<0.05, *** p<0.01. Standard errors are clustered by donor–recipient pair.

Notes: PPML estimates using the 2005-2024 sample. The dependent variable is bilateral goods exports, expressed in constant 2021 euros. Total ODA refers to the total ODA received by a recipient, including bilateral donors and EU institutions. It is expressed in constant 2021 euros and transformed as ln(max(1, ODA)). All specifications include a zero-ODA indicator, but we do not report its coefficient. The top five total ODA donors are France, Germany, the UK, Italy and Sweden; together they account for 73.10% of total ODA in the sample. PTA denotes an active PTA and is included where identified and is omitted automatically when collinear with the fixed effects. Bilateral distance is measured as the logarithm of the distance between each donor–recipient country pair. Common legal origin and common language are binary indicators equal to 1 when the country pair shares the respective characteristic, and zero otherwise.

Appendix 6 EU ODA and goods exports: heterogeneity by government effectiveness

	(1)	(2)	(3)	(4)
	High governance	Low governance	High governance	Low governance
EU ODA	0.783***	0.734***	0.089	0.061
	(0.077)	(0.095)	(0.114)	(0.124)
Bilateral distance	-0.036	-1.247***	-1.544***	-1.388***
	(0.296)	(0.222)	(0.174)	(0.428)
Common legal origin	0.978***	1.202***	0.850***	1.050***
	(0.258)	(0.314)	(0.101)	(0.189)
Common language	-0.051	0.029	0.484***	0.616***
	(0.248)	(0.240)	(0.130)	(0.205)
PTA	2.082***	0.590***	0.311	0.465
	(0.241)	(0.186)	(0.391)	(0.504)
Observations	14,560	14,560	14,430	14,430
Donor-year FE	No	No	Yes	Yes
Recipient-year FE	No	No	Yes	Yes

Standard errors in parentheses. * p<0.10, ** p<0.05, *** p<0.01. Standard errors are clustered by donor–recipient pair.

Notes: PPML estimates using the 2005-2024 sample. The dependent variable is bilateral goods exports, expressed in constant 2021 euros. EU ODA refers to EU institutions' ODA allocated across donors using their EU budget shares. It is expressed in constant 2021 euros and transformed as ln(max(1, ODA)). The zero-EU-ODA indicator is not included because it is not separately identified in the preferred specification with donor-year and recipient-year FE. Government Effectiveness is from the World Bank WGI and captures perceptions of the quality of public services and the civil service, the quality of policy formulation and implementation, and the credibility of government decisions. The Government Effectiveness measure is expressed on the WGI absolute 0–100 scale, with higher values indicating better governance. For each year, recipient countries above the annual median Government Effectiveness score are classified as high governance, while countries at or below the annual median are classified as low governance. PTA denotes an active PTA. Bilateral distance is measured as the logarithm of the distance between each donor–recipient country pair. Common legal origin and common language are binary indicators equal to 1 when the country pair shares the respective characteristic, and zero otherwise.

Appendix 7 Bilateral ODA and goods exports: heterogeneity by government effectiveness

	(1) High governance	(2) Low governance	(3) High governance	(4) Low governance
Bilateral ODA	0.451***	0.369***	0.101***	0.090**
	(0.057)	(0.053)	(0.024)	(0.035)
Bilateral distance	-0.379*	-1.393***	-1.350***	-1.411***
	(0.208)	(0.184)	(0.156)	(0.410)
Common legal origin	0.332	0.636**	0.774***	0.913***
	(0.316)	(0.320)	(0.103)	(0.187)
Common language	-0.173	-0.093	0.417***	0.499***
	(0.279)	(0.230)	(0.126)	(0.188)
PTA	2.411***	0.530***	0.315	0.519
	(0.236)	(0.179)	(0.387)	(0.500)
Observations	14,560	14,560	14,430	14,430
Donor-year FE	No	No	Yes	Yes
Recipient-year FE	No	No	Yes	Yes

Standard errors in parentheses. * p<0.10, ** p<0.05, *** p<0.01. Standard errors are clustered by donor–recipient pair.

Notes: PPML estimates using the 2005–2024 sample. The dependent variable is bilateral goods exports, expressed in constant 2021 euros. Bilateral ODA refers to ODA provided directly by an individual donor country to a recipient country. It is expressed in constant 2021 euros and transformed as ln(max(1, ODA)). A zero-bilateral-ODA indicator is included in all specifications, but its coefficient is not reported. Government Effectiveness is from the World Bank WGI and captures perceptions of the quality of public services and the civil service, the quality of policy formulation and implementation, and the credibility of government decisions. The Government Effectiveness measure is expressed on the WGI absolute 0–100 scale, with higher values indicating better governance. For each year, recipient countries above the annual median Government Effectiveness score are classified as high governance, while countries at or below the annual median are classified as low governance. PTA denotes an active PTA. Bilateral distance is measured as the logarithm of the distance between each donor–recipient country pair. Common legal origin and common language are binary indicators equal to 1 when the country pair shares the respective characteristic, and zero otherwise.

Appendix 8 Total ODA and goods exports: heterogeneity by government effectiveness

	(1) High governance	(2) Low governance	(3) High governance	(4) Low governance
Total ODA	0.652***	0.564***	0.200***	0.165***
	(0.057)	(0.048)	(0.043)	(0.054)
Bilateral distance	-0.260	-1.528***	-1.404***	-1.525***
	(0.238)	(0.187)	(0.150)	(0.393)
Common legal origin	0.346	0.540*	0.758***	0.856***
	(0.332)	(0.317)	(0.106)	(0.184)
Common language	-0.169	-0.045	0.400***	0.519***
	(0.291)	(0.227)	(0.120)	(0.189)
PTA	2.281***	0.476***	0.259	0.497
	(0.233)	(0.166)	(0.391)	(0.507)
Observations	14,560	14,560	14,430	14,430
Donor-year FE	No	No	Yes	Yes
Recipient-year FE	No	No	Yes	Yes

Standard errors in parentheses. * p<0.10, ** p<0.05, *** p<0.01. Standard errors are clustered by donor–recipient pair.

Notes: PPML estimates using the 2005–2024 sample. The dependent variable is bilateral goods exports, expressed in constant 2021 euros. Total ODA refers to the total ODA received by a recipient, including assistance from bilateral donors and EU institutions. It is expressed in constant 2021 euros and transformed as ln(max(1, ODA)). We include a zero-total-ODA indicator in all specifications, but we do not report its coefficient. Government Effectiveness is from the World Bank Worldwide Governance Indicators and captures perceptions of the quality of public services and the civil service, the quality of policy formulation and implementation, and the credibility of government decisions. The Government Effectiveness measure is expressed on the WGI absolute 0–100 scale, with higher values indicating better governance. For each year, recipient countries above the annual median Government Effectiveness score are classified as high governance, while countries at or below the annual median are classified as low governance. PTA denotes an active PTA. Bilateral distance is measured as the logarithm of the distance between each donor–recipient country pair. Common legal origin and common language are binary indicators equal to 1 when the country pair shares the respective characteristic, and zero otherwise.

Appendix 9 EU ODA and services exports: major versus other donors

	(1)	(2)	(3)	(4)	(5)	(6)	(7)	(8)	(9)	(10)
	Top five	Others	Top five	Others	Top five	Others	Top five	Others	Top five	Others
	Total services		Commercial services		Other commercial services		Modern services		Traditional services	
EU ODA	0.147***	0.298***	0.146***	0.308***	0.157***	0.509***	0.164***	0.561***	0.039	0.187**
	(0.044)	(0.083)	(0.046)	(0.082)	(0.051)	(0.106)	(0.052)	(0.127)	(0.068)	(0.078)
Bilateral distance	-1.625***	-0.577***	-1.647***	-0.583***	-1.647***	-0.301	-1.624***	-0.331	-1.437***	-0.585***
	(0.297)	(0.171)	(0.309)	(0.171)	(0.331)	(0.237)	(0.380)	(0.210)	(0.315)	(0.185)
Common legal origin	0.612***	0.919***	0.630***	0.916***	0.662***	0.998***	0.542***	0.756***	0.711***	0.887***
	(0.143)	(0.183)	(0.147)	(0.183)	(0.169)	(0.232)	(0.182)	(0.243)	(0.166)	(0.199)
Common language	0.378***	0.534***	0.371***	0.530***	0.234	0.497***	0.227	0.440***	0.469***	0.707***
	(0.128)	(0.132)	(0.131)	(0.135)	(0.144)	(0.165)	(0.158)	(0.168)	(0.145)	(0.150)
PTA	0.000	-0.473**	0.000	-0.448**	0.000	-0.730**	0.000	-0.551	0.000	-0.373*
	(.)	(0.230)	(.)	(0.227)	(.)	(0.341)	(.)	(0.366)	(.)	(0.203)
Constant	18.875***	9.240***	19.044***	9.269***	18.918***	6.792***	18.714***	6.990***	16.529***	8.283***
	(2.522)	(1.459)	(2.620)	(1.462)	(2.845)	(2.052)	(3.269)	(1.833)	(2.627)	(1.557)
Observations	4,900	22,540	4,900	22,540	4,900	22,540	4,900	22,540	4,900	22,540

Standard errors in parentheses. * p<0.10, ** p<0.05, *** p<0.01. Standard errors are clustered by donor–recipient pair.

Notes: PPML estimates using the 2005–2024 sample. All specifications include donor-year and recipient-year FE. The dependent variables are bilateral services exports, expressed in constant 2021 euros. EU ODA refers to EU institutions' ODA allocated across donors using their EU budget shares. It is expressed in constant 2021 euros and has been log-transformed. All specifications include a zero-ODA indicator, but its coefficient is not reported. The top five donors by allocated EU ODA are Germany, France, Italy, the UK and Spain; together they account for 69.34% of allocated EU ODA in the services sample. Total services comprise all services categories (SA–SL). Commercial services exclude government services (SA–SK). Other commercial services comprise construction through personal, cultural and recreational services (SE–SK). Modern services comprise insurance and pension services; financial services; intellectual property services; telecommunications, computer and information services; and other business services (SF–SJ). Traditional services comprise transport; travel; construction; and personal, cultural and recreational services (SC+SD+SE+SK). Bilateral distance is measured as the logarithm of the distance between each donor-recipient country pair. Common legal origin and common language are binary indicators equal to 1 when the country pair shares the respective characteristic, and zero otherwise. PTA denotes an active PTA.

Appendix 10 Bilateral ODA and services exports: major versus other donors

	(1)	(2)	(3)	(4)	(5)	(6)	(7)	(8)	(9)	(10)
	Top five	Others	Top five	Others	Top five	Others	Top five	Others	Top five	Others
	Total services		Commercial services		Other commercial services		Modern services		Traditional services	
Bilateral ODA	0.078**	0.165***	0.078**	0.169***	0.032	0.221***	0.031	0.211***	0.107***	0.169***
	(0.032)	(0.023)	(0.033)	(0.022)	(0.042)	(0.029)	(0.042)	(0.029)	(0.028)	(0.026)
Bilateral distance	-2.284***	-0.625***	-2.370***	-0.630***	-2.071**	-0.253*	-2.149**	-0.255**	-2.347***	-0.753***
	(0.711)	(0.124)	(0.739)	(0.124)	(0.842)	(0.142)	(0.918)	(0.128)	(0.666)	(0.148)
Common legal origin	0.390**	0.798***	0.419**	0.792***	0.385**	0.904***	0.237	0.778***	0.555***	0.718***
	(0.158)	(0.119)	(0.165)	(0.118)	(0.187)	(0.132)	(0.189)	(0.131)	(0.183)	(0.153)
Common language	0.366**	0.395***	0.343**	0.393***	0.263	0.309***	0.278	0.246**	0.412**	0.515***
	(0.157)	(0.093)	(0.162)	(0.094)	(0.184)	(0.105)	(0.191)	(0.107)	(0.165)	(0.115)
PTA	0.000	0.083	0.000	0.121	0.000	0.039	0.000	0.273	0.000	0.093
	(.)	(0.137)	(.)	(0.135)	(.)	(0.204)	(.)	(0.217)	(.)	(0.128)
Constant	24.971***	9.156***	25.696***	9.160***	23.187***	5.697***	23.864***	5.600***	24.254***	9.470***
	(6.054)	(1.047)	(6.301)	(1.049)	(7.273)	(1.226)	(7.945)	(1.125)	(5.598)	(1.228)
Observations	4,900	22,540	4,900	22,540	4,900	22,540	4,900	22,540	4,900	22,540

Standard errors in parentheses. * p<0.10, ** p<0.05, *** p<0.01. Standard errors are clustered by donor–recipient pair.

Notes: PPML estimates using the 2005–2024 sample. All specifications include donor-year and recipient-year FE. The dependent variables are bilateral services exports, expressed in constant 2021 euros. Bilateral ODA refers to ODA provided directly by an individual donor country to a recipient country. It is expressed in constant 2021 euros and has been log-transformed. All specifications include a zero-ODA indicator, but its coefficient is not reported. The top five bilateral ODA donors are France, Germany, the UK, Sweden and the Netherlands; together they account for 77.94% of bilateral ODA in the services sample. Total services comprise all services categories (SA–SL). Commercial services exclude government services (SA–SK). Other commercial services comprise construction through personal, cultural and recreational services (SE–SK). Modern services comprise insurance and pension, financial, intellectual property, telecommunications/computer/information and other business services (SF–SJ). Traditional services comprise transport, travel, construction and personal, cultural and recreational services (SC+SD+SE+SK). Bilateral distance is measured as the logarithm of the distance between each donor-recipient country pair. Common legal origin and common language are binary indicators equal to one when the country pair shares the respective characteristic, and zero otherwise. PTA denotes an active PTA.

Appendix 11 Total ODA and services exports: major versus other donors

	(1)	(2)	(3)	(4)	(5)	(6)	(7)	(8)	(9)	(10)
	Top five	Others	Top five	Others	Top five	Others	Top five	Others	Top five	Others
	Total services		Commercial services		Other commercial services		Modern services		Traditional services	
Total ODA	0.144***	0.237***	0.140***	0.244***	0.103	0.302***	0.094	0.294***	0.186***	0.249***
	(0.052)	(0.031)	(0.053)	(0.031)	(0.073)	(0.042)	(0.072)	(0.047)	(0.045)	(0.032)
Bilateral Distance	-1.516***	-0.742***	-1.613***	-0.748***	-1.887***	-0.397**	-2.006***	-0.420**	-1.104***	-0.817***
	(0.325)	(0.134)	(0.335)	(0.133)	(0.494)	(0.172)	(0.524)	(0.165)	(0.342)	(0.147)
Common Legal Origin	0.495***	0.813***	0.520***	0.808***	0.536***	0.838***	0.409**	0.655***	0.587***	0.792***
	(0.155)	(0.130)	(0.161)	(0.130)	(0.185)	(0.167)	(0.194)	(0.175)	(0.167)	(0.147)
Common Language	0.284**	0.394***	0.273**	0.385***	0.161	0.352***	0.174	0.318**	0.337**	0.501***
	(0.129)	(0.105)	(0.133)	(0.106)	(0.143)	(0.135)	(0.152)	(0.138)	(0.153)	(0.124)
PTA	0.000	-0.160	0.000	-0.128	0.000	-0.258	0.000	-0.065	0.000	-0.134
	(.)	(0.151)	(.)	(0.147)	(.)	(0.221)	(.)	(0.244)	(.)	(0.144)
Constant	18.006***	10.304***	18.826***	10.321***	21.201***	7.107***	22.264***	7.260***	13.351***	9.998***
	(2.763)	(1.133)	(2.850)	(1.127)	(4.291)	(1.484)	(4.548)	(1.435)	(2.850)	(1.230)
Observations	4,900	22,540	4,900	22,540	4,900	22,540	4,900	22,540	4,900	22,540

Standard errors in parentheses. * p<0.10, ** p<0.05, *** p<0.01. Standard errors are clustered by donor–recipient pair.

Notes: PPML estimates using the 2005–2024 sample. All specifications include donor-year and recipient-year FE. The dependent variables are bilateral services exports, expressed in constant 2021 euros. Total ODA refers to the total ODA received by a recipient, including bilateral donors and EU institutions. It is expressed in constant 2021 euros and has been log-transformed. All specifications include a zero-ODA indicator, but its coefficient is not reported. The top five total ODA donors are France, Germany, the UK, Italy and Sweden; together they account for 72.65% of total ODA in the services sample. Total services comprise all services categories (SA–SL). Commercial services exclude government services (SA–SK). Other commercial services comprise construction through personal, cultural and recreational services (SE–SK). Modern services comprise insurance and pension services; financial services; intellectual property services; telecommunications, computer and information services; and other business services (SF–SJ). Traditional services comprise transport; travel; construction; and personal, cultural and recreational services (SC+SD+SE+SK). Bilateral distance is measured as the logarithm of the distance between each donor-recipient country pair. Common legal origin and common language are binary indicators equal to 1 when the country pair shares the respective characteristic, and zero otherwise. PTA denotes an active preferential trade agreement.

Appendix 12 EU ODA and services exports: heterogeneity by government effectiveness

	(1)	(2)	(3)	(4)	(5)	(6)	(7)	(8)	(9)	(10)
	High gov	Low gov	High gov	Low gov	High gov	Low gov	High gov	Low gov	High gov	Low gov
	Total services		Commercial services		Other commercial services		Modern services		Traditional services	
EU ODA	0.098	0.190***	0.100	0.194***	0.150**	0.277***	0.158***	0.254***	-0.026	0.080
	(0.069)	(0.043)	(0.072)	(0.042)	(0.067)	(0.058)	(0.060)	(0.059)	(0.083)	(0.066)
Bilateral distance	-1.038***	-0.726***	-1.053***	-0.762***	-0.808***	-0.663	-0.801***	-0.469	-1.134***	-0.324
	(0.127)	(0.275)	(0.130)	(0.277)	(0.144)	(0.463)	(0.151)	(0.491)	(0.145)	(0.315)
Common legal origin	0.722***	0.633***	0.738***	0.642***	0.714***	0.606***	0.620***	0.365*	0.789***	0.837***
	(0.107)	(0.120)	(0.111)	(0.123)	(0.123)	(0.183)	(0.129)	(0.193)	(0.129)	(0.117)
Common language	0.434***	0.419***	0.430***	0.412***	0.392***	0.265**	0.400***	0.188	0.437***	0.661***
	(0.089)	(0.100)	(0.092)	(0.101)	(0.105)	(0.121)	(0.110)	(0.124)	(0.105)	(0.118)
PTA	0.005	-0.302	0.034	-0.290	-0.168	-0.044	0.080	0.082	0.100	-0.331
	(0.228)	(0.325)	(0.225)	(0.326)	(0.304)	(0.469)	(0.311)	(0.317)	(0.196)	(0.274)
Constant	13.596***	11.204***	13.674***	11.504***	11.267***	10.761***	11.074***	9.057**	13.689***	6.679**
	(1.088)	(2.356)	(1.116)	(2.371)	(1.267)	(3.995)	(1.334)	(4.235)	(1.233)	(2.653)
Observations	13,916	13,524	13,916	13,524	13,916	13,524	13,916	13,524	13,916	13,524

Standard errors in parentheses. * p<0.10, ** p<0.05, *** p<0.01. Standard errors are clustered by donor–recipient pair.

Notes: PPML estimates using the 2005–2024 sample. All specifications include donor-year and recipient-year FE. The dependent variables are bilateral services exports, expressed in constant 2021 euros. EU ODA refers to EU institutions' ODA allocated across donors using their EU budget shares. It is expressed in constant 2021 euros and has been log-transformed. All specifications include a zero-ODA indicator, but its coefficient is not reported. Government Effectiveness is from the World Bank WGI and captures perceptions of the quality of public services and the civil service, the quality of policy formulation and implementation, and the credibility of government decisions. The Government Effectiveness measure is expressed on the WGI absolute 0–100 scale, with higher values indicating better governance. For each year, recipient countries above the annual median Government Effectiveness score are classified as high governance, while countries at or below the annual median are classified as low governance. Total services comprise all services categories (SA–SL). Commercial services exclude government services (SA–SK). Other commercial services comprise construction through personal, cultural and recreational services (SE–SK). Modern services comprise insurance and pension services; financial services; intellectual property services; telecommunications, computer and information services; and other business services (SF–SJ). Traditional services comprise transport; travel; construction; and personal, cultural and recreational services (SC+SD+SE+SK). Bilateral distance is measured as the logarithm of the distance between each donor-recipient country pair. Common legal origin and common language are binary indicators equal to 1 when the country pair shares the respective characteristic, and zero otherwise. PTA denotes an active PTA.

Appendix 13 Bilateral ODA and services exports: heterogeneity by government effectiveness

	(1)	(2)	(3)	(4)	(5)	(6)	(7)	(8)	(9)	(10)
	High gov	Low gov	High gov	Low gov	High gov	Low gov	High gov	Low gov	High gov	Low gov
	Total services		Commercial services		Other commercial services		Modern services		Traditional services	
Bilateral ODA	0.082***	0.073**	0.083***	0.071**	0.076***	0.070*	0.069**	0.061	0.090***	0.118***
	(0.021)	(0.030)	(0.022)	(0.030)	(0.028)	(0.041)	(0.029)	(0.042)	(0.022)	(0.029)
Bilateral distance	-0.912***	-0.765***	-0.924***	-0.798***	-0.686***	-0.692	-0.691***	-0.479	-1.001***	-0.414
	(0.112)	(0.259)	(0.115)	(0.261)	(0.135)	(0.445)	(0.144)	(0.485)	(0.131)	(0.292)
Common legal origin	0.660***	0.493***	0.677***	0.505***	0.668***	0.487***	0.578***	0.271	0.709***	0.616***
	(0.107)	(0.115)	(0.110)	(0.117)	(0.118)	(0.174)	(0.124)	(0.192)	(0.134)	(0.121)
Common language	0.336***	0.325***	0.330***	0.316***	0.286***	0.119	0.303***	0.046	0.333***	0.563***
	(0.087)	(0.102)	(0.089)	(0.104)	(0.102)	(0.121)	(0.107)	(0.128)	(0.104)	(0.121)
PTA	0.020	-0.127	0.050	-0.117	-0.127	0.112	0.125	0.144	0.062	-0.222
	(0.216)	(0.269)	(0.213)	(0.268)	(0.292)	(0.317)	(0.297)	(0.218)	(0.189)	(0.296)
Constant	12.641***	11.524***	12.691***	11.799***	10.429***	11.039***	10.359***	9.174**	12.458***	7.316***
	(0.964)	(2.229)	(0.993)	(2.247)	(1.202)	(3.855)	(1.292)	(4.194)	(1.103)	(2.460)
Observations	13,916	13,524	13,916	13,524	13,916	13,524	13,916	13,524	13,916	13,524

Standard errors in parentheses. * p<0.10, ** p<0.05, *** p<0.01. Standard errors are clustered by donor–recipient pair.

Notes: PPML estimates using the 2005–2024 sample. All specifications include donor-year and recipient-year FE. The dependent variables are bilateral services exports, expressed in constant 2021 euros. Bilateral ODA refers to ODA provided directly by an individual donor country to a recipient country. It is expressed in constant 2021 euros and has been log-transformed. All specifications include a zero-ODA indicator, but its coefficient is not reported. Government Effectiveness is from the World Bank WGI and captures perceptions of the quality of public services and the civil service, the quality of policy formulation and implementation, and the credibility of government decisions. The Government Effectiveness measure is expressed on the WGI absolute 0–100 scale, with higher values indicating better governance. For each year, recipient countries above the annual median Government Effectiveness score are classified as high governance, while countries at or below the annual median are classified as low governance. Total services comprise all services categories (SA–SL). Commercial services exclude government services (SA–SK). Other commercial services comprise construction through personal, cultural and recreational services (SE–SK). Modern services comprise insurance and pension, financial, intellectual property, telecommunications/computer/information and other business services (SF–SJ). Traditional services comprise transport, travel, construction and personal, cultural and recreational services (SC+SD+SE+SK). Bilateral distance is measured as the logarithm of the distance between each donor-recipient country pair. Common legal origin and common language are binary indicators equal to 1 when the country pair shares the respective characteristic, and zero otherwise. PTA denotes an active PTA.

Appendix 14 Total ODA and services exports: heterogeneity by government effectiveness

	(1)	(2)	(3)	(4)	(5)	(6)	(7)	(8)	(9)	(10)
	High gov	Low gov	High gov	Low gov	High gov	Low gov	High gov	Low gov	High gov	Low gov
	Total services		Commercial services		Other commercial services		Modern services		Traditional services	
Total ODA	0.132***	0.117***	0.135***	0.115***	0.131***	0.124**	0.117***	0.108*	0.157***	0.175***
	(0.032)	(0.040)	(0.033)	(0.040)	(0.041)	(0.058)	(0.041)	(0.061)	(0.035)	(0.038)
Bilateral distance	-0.981***	-0.844***	-0.994***	-0.878***	-0.760***	-0.804*	-0.763***	-0.558	-1.056***	-0.466*
	(0.115)	(0.256)	(0.119)	(0.258)	(0.137)	(0.440)	(0.146)	(0.473)	(0.131)	(0.283)
Common legal origin	0.654***	0.448***	0.669***	0.458***	0.657***	0.402**	0.570***	0.189	0.693***	0.579***
	(0.108)	(0.114)	(0.111)	(0.116)	(0.124)	(0.185)	(0.130)	(0.203)	(0.129)	(0.115)
Common language	0.357***	0.366***	0.350***	0.360***	0.317***	0.199*	0.339***	0.129	0.334***	0.582***
	(0.091)	(0.100)	(0.094)	(0.102)	(0.110)	(0.119)	(0.115)	(0.123)	(0.108)	(0.121)
PTA	0.008	-0.109	0.038	-0.098	-0.135	0.185	0.121	0.229	0.041	-0.238
	(0.217)	(0.291)	(0.213)	(0.290)	(0.292)	(0.364)	(0.297)	(0.230)	(0.190)	(0.330)
Constant	12.972***	12.006***	13.028***	12.294***	10.795***	11.777***	10.738***	9.646**	12.632***	7.531***
	(1.004)	(2.211)	(1.032)	(2.231)	(1.236)	(3.817)	(1.317)	(4.097)	(1.104)	(2.375)
Observations	13,916	13,524	13,916	13,524	13,916	13,524	13,916	13,524	13,916	13,524

Standard errors, reported in parentheses, are clustered by donor-recipient pair. * p<0.10, ** p<0.05, *** p<0.01.

Notes: PPML estimates using the 2005–2024 sample. All specifications include donor-year and recipient-year FE. The dependent variables are bilateral services exports, expressed in constant 2021 euros. Total ODA refers to the total ODA received by a recipient, including assistance from bilateral donors and EU institutions. It is expressed in constant 2021 euros and has been log-transformed. All specifications include a zero-ODA indicator, but its coefficient is not reported. Government Effectiveness is from the World Bank WGI and captures perceptions of the quality of public services and the civil service, the quality of policy formulation and implementation, and the credibility of government decisions. The Government Effectiveness measure is expressed on the WGI absolute 0–100 scale, with higher values indicating better governance. For each year, recipient countries above the annual median Government Effectiveness score are classified as high governance, while countries at or below the annual median are classified as low governance. Total services comprise all services categories (SA–SL). Commercial services exclude government services (SA–SK). Other commercial services comprise construction through personal, cultural and recreational services (SE–SK). Modern services comprise insurance and pension, financial, intellectual property, telecommunications/computer/information and other business services (SF–SJ). Traditional services comprise transport, travel, construction and personal, cultural and recreational services (SC+SD+SE+SK). Bilateral distance is measured as the logarithm of the distance between each donor-recipient country pair. Common legal origin and common language are binary indicators equal to 1 when the country pair shares the respective characteristic, and zero otherwise. PTA denotes an active PTA.