Sanctions and services trade: the neglected dimension[*]

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Abstract

Existing literature focuses on the effect of sanctions on merchandise trade and investment, neglecting the services trade dimension. We contribute by using the Global Sanctions Database (Felbermayr et al. 2020a,b) to examine the impact of sanctions on bilateral services trade in a structural gravity framework. Our results reveal considerable heterogeneity in sanctions-impact across sectors and depending upon sanctions-type. Trade sanctions are found to reduce sender-target services trade while military, financial and travel sanctions are found to enhance it. This positive effect contrasts with the largely insignificant effect of non-trade sanctions on merchandise trade in the literature and is driven by insurance, financial, ICT, business and maintenance and repair services. Our findings allude to the use of specific services to counter adverse effects of sanctions-imposition or for sanctions-busting, suggesting a review of the instrument's design, coverage and implementation to meet intended objectives.

JEL classification: F1, F10, F13

Key words: Sanctions; services trade; heterogeneity; GSDB; structural gravity

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1 Introduction

Extant work largely estimates an adverse impact of economic sanctions on merchandise trade (Caruso, 2003; Hufbauer and Oegg, 2003; Yang et al. 2004; Afesorgbor, 2019; Crozet and Hinz, 2020; Felbermayr et al. 2020a,b; Dai et al. 2021) providing more mixed evidence for investment (Biglaiser and Lektzian, 2011; Lektzian and Biglaiser, 2013; Barry and Kleinberg, 2015; Mirkina, 2018; Le and Bach, 2022). However, the effect of sanctions on services trade is largely neglected[1]. This omission is non-trivial given that services account for a quarter of international trade on a BOP basis and their contribution nearly doubles on a value-added basis (WTO, 2019).

We bridge this research gap by looking explicitly at the impact of sanctions on bilateral services trade using the Global Sanctions Database (GSDB; Felbermayr et al. 2020a,b). Sanctions are likely to have an adverse effect on sender-target bilateral trade in general by impacting aggregate productivity and increasing bilateral trade costs, which inter alia also affects firms' ability to source essential intermediates (Ahn and Ludema, 2020). Additionally in the context of services trade, there are different ways in which sanctions can have an effect depending both on the type of sanction imposed[2] and the services sector impacted. For instance, financial sanctions are likely to affect financial intermediation services directly by making it difficult, if not impossible, for commercial banks in target countries to conduct a range of activities including international money transfers, commerical lending, opening and operating nostril accounts[3], issuing letters of credit, etc. (Nzaro et al. 2011) and by raising costs Dizaji (2021); in extreme cases, financial sanctions may extend to non-banking payment platforms thereby directly impeding trade in Mode[4] 1-intensive sectors such as

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[1]To the best of our knowledge, only Besedes et al. (2022) examine the impact of (financial) sanctions imposed by Germany on its merchandise and services trade as well as financial flows but this analysis is not cross-country and hence, not strictly undertaken in a structural gravity framework. Hufbauer and Oegg (2003) use the share of gravity-estimated loss in merchandise exports in total US exports to "predict" the loss in services exports. Korhonen et al. (2018) provide stylized facts to illustrate the impact of sanctions and counter-sanctions on the Russian economy, including its services trade, without any causal inference. Specific to financial services, Nzaro et al. (2011) qualitatively assess the impact of economic sanctions on financial services offered by Zimbabwean commercial banks while Dizaji (2021) uses stochastic frontier analysis to study the impact of sanctions-intensity on bank costs in Iran. In other work, Besedes et al. (2017, 2021) and Efing et al. (2018) examine the impact of financial sanctions on financial flows and performance of both financial and non-financial firms. Meanwhile, there is a much larger literature on the impact of sanctions on tourism (a component of travel services trade) but this is mostly descriptive and/or qualitative, based on case studies (see Hall and Seyfi, 2021 for an excellent review).

[2]Annex A provides illustrations of sanctions directly or indirectly affecting services trade.

[3]Nostril accounts are foreign currency deposits of a local bank held with the corresponding bank in another country usually in the currency of that country.

[4]According to the WTO General Agreement on Trade in Services or GATS, services are traded via four "modes of supply". Mode 1 ("cross-border trade") covers the whole range remotely-delivered services e.g.

transport, ICT, finance, insurance and business services[5].

Travel sanctions directly restrict trade in Mode 2-intensive sectors such as travel (tourism and business), health and education services; as well as the movement of independent professionals, contractual service suppliers, and intra-corporate transferees in Mode 3- and Mode 4-intensive sectors such as construction, distribution and business services. Sanctions can also impact travel services trade indirectly by affecting the tourism sector's access to equipment and technology, leading to depleted infrastructure in the long-term as well as a negative destination image (Hall and Seyfi, 2021).

Meanwhile, trade sanctions normally target (specific) goods only but given the increasing global trend towards "servicification" (Lodefalk, 2016), services used as inputs in manufacturing activity (such as transport, logistics, distribution, manufacturing services on physical inputs, and maintenance & repair) are expected to be indirectly impacted by the adverse effects of trade sanctions on merchandise trade. Transport and logistics services are also complementary to military assistance activities and hence likely to be adversely affected by military sanctions. At the same time, sanctions can also generate positive effects on services trade due to the need for enhanced insurance, financial, business (accountancy, legal), maintenance and ICT services to negotiate adverse fallouts from sanctions imposition or even as a coping response (Hall and Seyfi, 2021). Thus, the net impact of sanctions on total services trade is ambiguous and at best, an empirical question.

We examine this question in the framework of a structural gravity model following recent literature (Anderson et al. 2018; Felbermayr et al. 2020a,b). Our analysis reveals considerable heterogeneity in sanctions-impact across sectors and depending upon sanctions-type. Trade sanctions are found to reduce sender-target services trade while military, financial and travel sanctions are found to enhance it. This positive effect, driven by insurance, financial, ICT, business and maintenance and repair services, contrasts with the largely insignificant effect of non-trade sanctions on merchandise trade (Felbermayr et al. 2020a,b). While this is an unexpected finding likely alluding to use of specific services to counter adverse fallouts of sanctions-imposition, it also suggests that services may provide targeted countries avenues for sanctions-busting. Thus senders may need to revisit the design, coverage and implementation of the instrument to improve its effectiveness.

The paper is structured as follows. Section 2 discusses the empirical model. Section 3

BPO services. Mode 2 ("consumption abroad") refers to services transacted by the consumer in the economy of the supplier e.g. tourism. Mode 3 ("commercial presence") refers to foreign affiliate activities in the host economy e.g. foreign bank operations. Mode 4 ("movement of natural persons") categorizes services delivered by suppliers in the economy of the consumer e.g. onsite software programmers.

[5]Sectoral mode-intensiveness is based on the distribution of global services trade by mode of supply in the WTO TISMOS (Trade in Services by Mode of Supply) database.

describes the results from estimation. Section 4 concludes.

2 Empirical model

We estimate a structural gravity model to examine the effect of sanctions on services trade. This approach is consistent with a wide class of models, including Armington (Armington, 1969), monopolistic competition (Krugman, 1979), heterogeneous firms under monopolistic competition (Melitz, 2003), and heterogeneous firms under perfect competition (Bernard et al. 2003). The baseline estimating equations take the following form:

$$X_{ijt}^k = exp[\beta_1 EIA_{ijt} + \beta_2 S_{ijt} + \mu_{it} + \gamma_{jt} + \chi_{ij} + \psi_{ji}] + \epsilon_{ijt} \tag{1}$$

$$M_{ijt}^k = exp[\beta_1 EIA_{ijt} + \beta_2 S_{ijt} + \mu_{it} + \gamma_{jt} + \chi_{ij} + \psi_{ji}] + \epsilon_{ijt} \tag{2}$$

where X_{ijt}^k denotes the nominal value of services exports from country i to j in sector k at time t; M_{ijt}^k denotes the nominal value of services imports into country i from j; EIA_{ijt} is a binary dummy denoting membership of a bilateral preferential trade agreement in goods (notified under Article XXIV of the GATT) or services (notified under Article V of the GATS) constructed using information from WTO's RTA-IS database; S_{ijt} is the sanctions vector comprising binary dummy variables for the imposition of arms, financial, military, trade, travel and other sanctions; and ϵ_{ijt} is the error term.

The use of three-way fixed effects ($\mu_{it}, \gamma_{jt}, \chi_{ij}$) mitigates endogeneity-related concerns in estimation (Baier et al. 2014). The time-varying exporter and importer fixed effects also account for multilateral resistance terms in estimation (Anderson and van Wincoop, 2003) and for time-varying exporter- and importer-specific observables and unobservables likely to influence bilateral services trade. Similarly, pairwise fixed effects absorb both observable and unobservable time-invariant bilateral determinants of services trade costs. The use of asymmetric bilateral fixed effects (χ_{ij}, ψ_{ji}) is consistent both with recent literature to account for asymmetric trade costs (Baier et al. 2019) and the bi-directional imposition of sanctions in the GSDB (Dai et al. 2021). All equations are estimated using the Pseudo-Poisson Maximum Likelihood estimator (PPML; Silva and Tenreyro, 2006) which accounts for both zero trade flows in sectoral services data and for heteroskedasticity-related concerns.

Bilateral services trade data are sourced from ITPD-E or the International Trade and Production Database for Estimation (Borchert et al. 2021) for total services and its broad

constituent sectors (according to the EBOPS 2010 classification) over 2000-2019 for a sample of 42 reporting and 63 partner countries. These are merged with the GSDB (Felbermayr et al. 2020a,b), which provides detailed data on sanctions between 210 sender and 186 target countries over 1950-2019. Given the scant availability of sector-specific bilateral services trade data and relatively limited overlap with the GSDB, the effective sample[6] is small and varies considerably by sector.

3   Results

Table 1 reports results from estimating equations (1) and (2) with data organized in a panel in continuous years over 2000-2019 given recent concerns about randomly excluding observations (Egger et al. 2022)[7]. Trade sanctions are found to reduce senders' bilateral services exports and imports with treatment effects of -17.3% and -42.6%[8], respectively. Military and travel sanctions have statistically strong positive effects on senders' bilateral services exports and imports, respectively, while financial sanctions are found to enhance sender-target services trade in either direction (albeit weakly).

The results provide evidence for heterogeneity in sanctions-impact along multiple dimensions. For instance, military sanctions have more positive effects on senders' bilateral exports across sectors (maintenance & repair, travel, ICT, education and trade-related services) while the same holds for travel and other sanctions vis-a-vis senders' bilateral imports (in maintenance & repair, ICT, business and government services). Financial and trade sanctions tend to reduce senders' bilateral exports and imports in different sectors (financial, business, government versus transport, travel for financial sanctions; transport, insurance, IP versus maintenance & repair, construction, financial, ICT for trade sanctions). Meanwhile, arms sanctions are associated with countervailing effects on services trade across sectors in either direction. In other results, membership of preferential trade agreements has a more positive effect on bilateral services exports across sectors than for imports.

<div align="center"><Insert Tables 1-2 here></div>

Some of these results can be explained as follows. Military assistance is accompanied by transport and logistics; both sectors report a decline in trade emanating from military sanctions. At the same time, a ban on military assistance may activate trade in other sectors

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[6]The countries are reported in Annex A.

[7]In sensitivity analysis, we also organized the data at five-year intervals from 2000 onwards to allow for adjustment of trade flows to sanctions imposition (cf. Cheng and Wall, 2005; Piermartini and Yotov, 2016); the positive effect of non-trade sanctions on services trade prevailed in those results.

[8]Calculated as $[exp^{(\widehat{coefficient})} - 1] * 100$.

such as maintenance & repair, insurance, financial, ICT and business services to negotiate the adverse fallouts; military sanctions are found to enhance trade in all these sectors. A similar explanation may account for the other-sanctions-induced rise in senders' bilateral services imports in maintenance & repair, financial, ICT and trade-related services. Travel sanctions directly impede travel services exports but they also enhance imports of ICT and business services, likely as a response/work-around strategy; notably, both sectors are Mode 1-intensive and hence, these services are deliverable remotely. Interestingly, financial sanctions reduce exports of financial services but enhance their imports, suggesting that the coverage and/or implementation of the instrument may be weak.

Further exploiting the granularity of the GSDB with respect to trade sanctions, we find their adverse effects to be driven by partially-imposed import and bilateral sanctions (see Table 2)[9]. This contrasts with the findings on merchandise trade (Felbermayr et al. 2020a,b) where the effects are driven by complete bilateral sanctions.

4 Conclusion

Extant work largely focuses on the impact of economic sanctions on merchandise trade and investment. We are the first to provide a cross-country, cross-sector analysis of the sanctions-services trade relationship in a structural gravity framework following recent advancements in estimation. In a significant departure from existing findings, we find non-trade sanctions to increase sender-target bilateral services trade. This alludes to the use of specific services to counter adverse fallouts or for sanctions-busting. Future work could explore the channels through which non-trade sanctions have a positive impact on services trade. It would also be useful to re-visit the sanctions-services trade relationship using a more comprehensive database that also covers Mode 3 trade or foreign affiliate transactions[10].

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[9]Interestingly, complete and partial bilateral sanctions enhance bilateral services exports in these results.

[10]Mode 3 accounts for nearly 60% of global services trade but is excluded from BOP data that forms the basis of most services trade databases including the ITPD-E.

References

Afesorgbor, S. K. (2019). The Impact of Economic Sanctions on International Trade: How Do Threatened Sanctions Compare with Imposed Sanctions? European Journal of Political Economy, 56: 11-26.

Anderson, J.E. and E. van Wincoop (2003). Gravity with Gravitas: A Solution to the Border Puzzle. American Economic Review, 93(1): 170–192.

Anderson, J. E., I. Borchert, A. Mattoo and Y. Yotov (2018). Dark costs, missing data: Shedding some light on services trade. European Economic Review, 105: 193-214.

Armington, P. (1969). A Theory of Demand for Products Distinguished by Place of Production. IMF Staff Papers, 16: 159–176.

Baier, S.L., Bergstrand, J., and Feng, M. (2014). Economic integration agreements and the margins of international trade. Journal of International Economics, 93(2): 339–350.

Baier, S. L., Y. Yotov, and T. Zylkin (2019). On the widely differing effects of free trade agreements: Lessons from twenty years of trade integration. Journal of International Economics, 116: 206-226.

Barry, C. M. and K. B. Kleinberg (2015). Profiting from Sanctions: Economic Coercion and US Foreign Direct Investment in Third-Party States. International Organization, 69(4): 881–912.

Bernard, A. B., Eaton, J., Jensen, J. B., & Kortum, S. (2003). Plants and productivity in international trade. American Economic Review, 93(4): 1268-1290.

Besedeš, T., S. Goldbach and V. Nitsch (2017). You're Banned! The Effect of Sanctions on German Cross-Border Financial Flows. Economic Policy, 32(April): 263-318.

Besedeš, T., S. Goldbach and V. Nitsch (2021). Cheap Talk? Financial Sanctions and NonFinancial Activity. European Economic Review, 134: 1036-88.

Besedeš, T., S. Goldbach and V. Nitsch (2022). Smart or smash? The effect of financial sanctions on trade in goods and services. Bundesbank Discussion Paper No. 28/2022.

Biglaiser, G. and D. Lektzian (2011). The Effect of Sanctions on U.S. Foreign Direct Investment. International Organization, 65(3): 531–551.

Caruso, R. (2003). The Impact of International Economic Sanctions on Trade - An Empirical Analysis. Peace Econ. Peace Sci. Public Policy, 9(2): 1–36.

Cheng, I-H. and H.J. Wall (2005). Controlling for Heterogeneity in Gravity Models of Trade and Integration. Federal Reserve Bank of St. Louis Review, 87(1): 49–63.

Crozet, M. and J. Hinz (2016). Friendly Fire - The Trade Impact of the Russia Sanctions and Counter-Sanctions. Kiel Working Papers 2059, Kiel Institute for the World Economy (Ifw).

Dai, M., G. Felbermayr, A. Kirilakha, C. Syropoulos, E. Yalcin and Y. Yotov (2021). Timing the Impact of Sanctions on Trade. School of Economics Working Paper Series 2021-7, LeBow College of Business, Drexel University.

Dizaji, S. F. (2021). The impact of sanctions on the banking system: new evidence from Iran. In Van Bergeijk, P. A. (ed), Research Handbook on Economic Sanctions (pp. 330-350). Edward Elgar Publishing.

Efing, M., S. Goldbach and V. Nitsch (2018). Freeze! Financial sanctions and bank responses. Bundesbank Discussion Paper No. 45/2018.

Egger, P., M. Larch and Y. Yotov (2022). Structural Gravity with Interval Data: Revisiting the Impact of Free Trade Agreements. Economica, 89(353): 44-61.

Felbermayr, G., A. Kirilakha, C. Syropoulos, E. Yalcin and Y. Yotov (2020a). The global sanctions data base. European Economic Review, Vol. 129(C).

Felbermayr, G., C. Syropoulos, E. Yalcin and Y. Yotov (2020b). On the Heterogeneous Effects of Sanctions on Trade and Welfare: Evidence from the Sanctions on Iran and a New Database. School of Economics Working Paper Series 2020-4, LeBow College of Business, Drexel University.

Hall, C.M. and S. Seyfi (2021). Tourism and sanctions. In Van Bergeijk, P. A. (ed), Research Handbook on Economic Sanctions. Edward Elgar Publishing.

Hufbauer, G. C. and B. Oegg (2003). The Impact of Economic Sanctions on US Trade: Andrew Rose's Gravity Model. Peterson Institute for International Economics, 2003.

Korhonen, I., H. Simola and L. Solanko (2018). Sanctions, countersanctions and Russia: Effects on economy, trade and finance. BOFIT Policy Brief, No. 4/2018, Bank of Finland, Institute for Economies in Transition (BOFIT), Helsinki, https://nbn-resolving.de/urn:nbn:fi:bof-201805301586.

Krugman, P. (1979). Increasing Returns, Monopolistic Competition and International Trade. Journal of International Economics, 9(4): 469–479.

Le, T.H. and N.T. Bach (2022). Global sanctions, foreign direct investment and global linkages: evidence from global data. The Journal of International Trade & Economic Development, 31(7): 967-994.

Lektzian, D. and G. Biglaiser (2013). Investment, Opportunity, and Risk: Do US Sanctions Deter or Encourage Global Investment? International Studies Quarterly, 57(1): 65–78.

Lodefalk, M. (2017). Servicification of firms and trade policy implications. World Trade Review, 16(1): 59-83.

Melitz, M. J. (2003). The impact of trade on intra-industry reallocations and aggregate industry productivity. Econometrica 71(6): 1695–1725.

Mirkina, I. (2018). FDI and Sanctions: An Empirical Analysis of Short- and Long-Run Effects. European Journal of Political Economy, 54:198–225.

Nzaro, R., K. Njanike and E. Munenerwa (2011). The impact of economic sanctions on financial services: a case of commercial banks in Zimbabwe. Mimeo.

Piermartini, R. and Y. Yotov (2016). Estimating Trade Policy Effects with Structural Gravity. WTO Working Paper ERSD-2016-10.

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

WTO (2019). World Trade Report 2019: The future of services trade.

Yang, J., H. Askari, J. Forrer and H. Teegen (2004). US Economic Sanctions: An Empirical Study. The International Trade Journal, 18(1), 23–62.

Data citation

Bilateral services trade data: ITPD-E

⇒Borchert, I., M. Larch, S. Shikher and Y. Yotov (2021). The International Trade and Production Database for Estimation (ITPD-E). International Economics, 166: 140–166.

Sanctions data: GSDB

⇒Felbermayr, G., A. Kirilakha, C. Syropoulos, E. Yalcin and Y. Yotov (2020a). The global sanctions data base. European Economic Review, Vol. 129(C).

⇒Felbermayr, G., C. Syropoulos, E. Yalcin and Y. Yotov (2020b). On the Heterogeneous Effects of Sanctions on Trade and Welfare: Evidence from the Sanctions on Iran and a New Database. School of Economics Working Paper Series 2020-4, LeBow College of Business, Drexel University.

Modal shares in total services exports/imports: WTO TISMOS

⇒Available at https://www.wto.org/english/res_e/statis_e/trade_datasets_e.htm

Annex A: Examples of sanctions directly or indirectly affecting services trade

Trade sanction: US proclamation 3447 against Cuba in 1962 prohibiting "the importation into the United States of all goods of Cuban origin and all goods imported from or through Cuba".

Travel sanction: Armenia-Azerbaijan border closure in 1989 due to the Nagorno-Karabakh War.

Financial sanction: UN Resolution 1737 against Iran in 2006 preventing "the provision to Iran of any technical assistance or training, financial assistance, investment, brokering or other services, and the transfer of financial resources or services, related to the supply, sale, transfer, manufacture or use of prohibited items, materials, equipment, goods and technology".

Military sanction: Swiss sanction against Somalia from May, 2009 prohibiting the "supply, sale and transit of armaments of all kinds, including weapons and ammunition, military vehicles and equipment, paramilitary equipment and accessories and spare parts" as well as the "provision of services of all kinds, including financing, Mediation services and technical training relating to the supply, sale, transit, production, maintenance and use of goods...and to military activities in Somalia".

Other sanction: Turkish sanction against Cyprus from April, 1987 prohibiting Cyprus flagged vessels to call at Turkish ports, which was extended in May, 1997 to cover "vessels under a foreign flag (of any nationality) sailing to Turkish ports directly from any Cypriot port under the effective control of the Republic of Cyprus (Limassol, Larnaca), or against vessels of any nationality related to the Republic of Cyprus in terms of ownership or ship management."

Annex B: Country sample (ITPDE-GSDB merged data)

Reporters (senders): Albania, Austria, Azerbaijan, Belgium, Bulgaria, Belarus, Canada, Switzerland, Czech Republic, Germany, Denmark, Spain, Estonia, Finland, France, United Kingdom, Greece, Croatia, Hungary, Ireland, Iceland, Italy, Japan, Kyrgz Republic, Lithuania, Luxembourg, Latvia, Malta, The Netherlands, Norway, New Zealand, Pakistan, Poland, Portugal, Romania, Russia, Serbia, Slovak Republic, Slovenia, Sweden, Turkiye, United States.

Partners (targets): Afghanistan, Albania, Austria, Azerbaijan, Belgium, Bulgaria, Bosnia & Herzegovina, Belarus, Canada, China, Cote d'Ivoire, Colombia, Cyprus, Czech Republic, Germany, Denmark, Egypt, Spain, Estonia, Finland, France, United Kingdom, Greece, Honduras, Croatia, Hungary, India, Ireland, Iran, Iraq, Israel, Italy, Kenya, Lebanon, Liberia, Libya, Lithuania, Luxembourg, Latvia, Moldova, Macedonia, Malta, Montenegro, Nigeria, The Netherlands, The Philippines, Poland, North Korea, Portugal, Romania, Russia, Sudan, Sierra Leone, Serbia, Slovak Republic, Slovenia, Sweden, Syria, Thailand, Ukraine, United States, Venezuela, Yemen.