The Extraterritoriality of Smart Sanctions

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Abstract

This paper presents the Firms Sanctioned DataBase (FSDB), a novel dataset documenting all firms and entities sanctioned by the European Union since 2001. The FSDB details the timeline of sanctions and the exact addresses of every targets inside of sanction programs (Iran, Russia,...). Using this granular dataset, I characterize anticipations and location of targets, and study how they affect the identification of the impact of sanctions on disaggregated bilateral trade flows. I find that extraterritorial sanctions decreased flows of sanctioned products by 38%. The estimate is similar when solely accounting for the staggered enforcement, with an higher variance though. Ignoring the staggered enforcement of sanctions considerably biases the estimate.

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1 Introduction

Economic sanctions weaponize trade dependencies between countries to achieve political coercion. The number of active sanction programs is increasing rapidly and is considerably impacting international trade (see Felbermayr et al., 2020). The literature has mostly documented sanctions' economic impact on various outcomes overlooking the type of sanctions used. However Felbermayr et al. (2020) document a predominant increase of firm-level (i.e. smart) sanctions. The relatively few empirical works and the absence of available dataset blocks the estimation of their impact. When sanctions cut trade flows for a whole sector, the impact should translate into a complete shutdown of trade relationships. The effect for firm-level sanctions is however unclear since competitors in the foreign economy could replace the target in the export market.

Additionally, economic sanctions have been considered active only at the beginning of the prohibitions on import and/or export. However earlier literature emphasized the importance of studying the threats of sanction. On the one hand, sanctions could simply threaten the target economy and never be applied. The literature has already studied the consequences of such threat[1]. On the other hand, sanctions could, at a first stage, threaten the target, which refuses to co-operate, and then be enforced in a second stage. The threat of sanction conditional on final imposition is often referred to as extraterritorial sanction, or secondary sanction. Little is known on how the anticipations of a yet-to-come sanction could affect the economic impact of sanctions on outcomes. Intuitively in both sending and target economy, importing firms could stockpile inputs to prevent shortages, and exporting firms could increase exports to reduce the cost of sanctions. Extraterritoriality has also been recently used to designate sanctions applied against targets outside the target country, but helping it circumvent the sanctions. It may be that these extraterritorial targets react differently to sanctions that the main targets since they also know the possibility of sanctions or fines.

In this paper, I introduce a new dataset called Firms Sanctioned DataBase (FSDB). It gathers information about all entities sanctioned by the EU through smart sanctions since 2001. I validate it through comparisons with the most comprehensive sanction dataset: the Global Sanction DataBase (GSDB) compiled by Felbermayr et al., 2020. The GSDB describes all sanctions programs enforced worlwide, but does not detail the targets inside the programs. The FSDB details the addresses, the timing of sanction, the factual and political justifications for the sanction of every entities. Exploiting the dataset I am able to study the extraterritorial impact of sanctions through two perspectives: location and anticipations.

The contributions of the FSDB are twofold. First, the precise address(es) allow to locate entities and study the extraterritorial sanctions, when firms are located outside of the main target. Most of the literature has studied the impact of sanctions considering the country targeted is the

[1]See the datasets TIES Morgan et al. (2014) and EUSANCT Weber and Schneider (2022) for such question.

only one affected by the sanction, as if entities were all located in it. Using exact addresses of entities, I can relax this assumption. Second, the timeline allows to measure the anticipatory behaviors of firms. Most of the literature has considered sanctions against one country were all enforced at the date of the beginning of the sanction program. The FSDB tracks the precise timing of the sanction of each entity. It can thus exploit the staggered enforcement of sanctions and quantify its impact on estimates. Furthermore, the FSDB can also measure periods where the sanction is not yet enforced, but the entity is informed of its potential embargo and can adapt.

The new information on targets allows to identify limits to the identification of the causal impact of sanctions on trade flows. More precisely, I document two types of location misclassifications that may affect control groups in empirical estimations. First, the false positive classification, when the researcher assumes that all entities included in a program are located in the program name. It is the most prevalent one and impacts 14% of the dataset. For example, papers focusing on sanctions against Iran assuming that the sanction is only impacting trade flows heading to Iran, would then misclassify 44% of the entities in the Iranian program, which are actually located in 30 other countries. Second, the false negative classification, when the researcher assumes that only entities in the program are located in the program's name, is also a concern. For instance, papers focusing only on the sanction programs against Russia miss around 5% of Russian entities, also sanctioned but in other programs. This misclassification is mainly driven by programs on terrorism, cybersecurity that are absent other datasets given their non-geographic names. This misclassification concerns 5% of the entities in the FSDB.

In addition, though most of the literature studies the impact of sanctions using the beginning of a conflict as the start of the treatment, entities are gradually sanctioned, and thus not all sectors impacted at the same time. Omitting staggered enforcement of sanctions, induces an average delay of 3 years where entities would be assumed sanctioned when they are actually not. Furthermore, by looking at jurisprudence cases of EU sanctions, it appears that the entities must be informed of their sanction before enforcing the embargo. It follows that automatically, all financial sanctions studied in the literature must be prone to anticipations of entities, even entities at the start date of the program. To solve for that problem, I build a first measure of anticipation of sanctions as the difference between the threat and the enforcement of the sanction detailed in the archive of the EU. The anticipation period lasts in average 2 months in my sample. The two last measures of anticipation focus on the dates of secondary sanction. Intuitively, this type of threat of sanction corresponds to the date at which a firm sees one of its trading partner getting sanctioned. The secondary target can then anticipate it is likely to be next and adjust. To measure secondary sanctions, I make use of another feature of the FSDB: a text justifying the actions of every entity leading to its sanction. When one searches for the name of another entity from the FSDB in that text, it is possible to create links between entities. A world cloud allows to interpret those links as business partnership. The difference in date between the sanction of

the entity and the date of its closest trade partner offers a first measure of secondary sanction. The last measure of anticipation extends this measure by allowing every entity to anticipate their sanction thanks to entities further up in the chain of sanctioned entities. The delays for both of those measure are in average around 2 years.

I then match the FSDB with ORBIS from Bureau Van Dijk to determine the goods produced by sanctioned firms. This new information allows to estimate a structural gravity equation and study the heterogeneous impact of sanctions across sectors. Doing so, I quantify the impact of the location mismeasurement and the anticipation in estimates of impact of sanctions on trade flows. Without correcting for location, neither anticipation, the estimate yields a decrease of trade flows by 34%. When only correcting for location, the estimate changes to -30%. If not accounting for location, but for anticipation the estimate becomes -54%. Eventually, correcting for both sources of bias yields a decrease of bilateral trade flows of 40%, with a much more precise estimation of the average treatment effect. Kolmogorov-Smirnov tests allow to reject the mutual correspondance of the distribution with and without biases. Put simply, the location bias overstates the impact of sanctions on trade flows, when the anticipation bias understates the estimate of the impact. The two compensate to some extent but the anticipation bias remains the most significant.

Reassessing the impact of sanctions on very detailed trade flows revealed that sanctions decrease in average trade flows by 40%. The impacts are heterogenous, ranging from a complete shut down of trade of 100% to a doubling of trade. This increase of trade following sanctions is partially rationalized by dual goods.

The results reveal that assuming that all entities are sanctioned at the date of the conflict creates a fictitious mass of sectors with a complete shutdown of trade due to sanctions. When accounting for the staggered treatment, it appears that the average impact of sanction on trade flows is still negative, but more moderate. Once taking into account the anticipation, the effect is similar, but estimated more precisely.

The intuition for the differences in estimation when taking anticipation into account may come from the construction of the control group. When the literature assumed that the not-yet sanctioned sectors were in the control group, it may be that they were actually anticipating their sanction and thus increasing their exports. The controls having an increase would then exacerbate the difference between control and treatment which would explain why estimates are smaller when taking into account anticipations.

Related literature

This paper contributes to three strands of the sanction literature.

First, it mechanically adds to the literature creating datasets of sanctions. Several datasets

have been used to study economic sanctions. On the one hand, some datasets have reported the date of threat of sanctions. The dataset compiled by Hufbauer et al. (2007), and the Threat and Imposition of Economic Sanctions dataset (TIES) compiled by Morgan et al. (2014) are examples of such. Those two datasets are aggregated in the EUSANCT dataset by Weber and Schneider (2022) if the sender is either the USA, the EU or the UN. Those datasets do not contain financial sanctions and are thus complementary to the FSDB. On the other hand, the most up-to-date dataset is the GSDB, created by Felbermayr et al. in 2020[2], and updated in 2021, 2024, 2025. This dataset gathers all types of sanctions. However, the GSDB assumes sanction begin with the year of the conflict. The FSDB thus provides more details and variables for episodes inside the GSDB. Neither of these datasets describe the targets inside of a sanction episode. The FSDB includes threats, detailed information on the precise timing of sanctions, their precise location and is thus making an effort towards the study of the targets.

Second this paper adds to the literature on the estimation of the causal impact of sanctions on bilateral trade flows. This literature has solely focused on the impact following a sanction against a whole sector: Haidar (2017) and Felbermayr et al. (2025) studying sanction on oils sectors against Iran, Aytun et al. (2025) studying Russian sanctions on Turkish agricultural goods, and Crozet and Hinz (2020) studying sanctions against Russia after the annexation of Crimea are recent examples. Most of this literature has focused on sanctions against Iran or Russia[3]. The closer paper in that literature is Besedeš et al. (2021) which considers a subset of the FSDB and study how these sanctions impacted trade flows with Germany. Yet, it relies on an usual assumption in the literature: a uniform sanction date for all firms in the target country. In contrast, this paper discusses the importance of taking into account the staggered enforcement of sanctions, and even the anticipations in the estimation of the impact of sanctions. This paper also highlights the limits of an assumption common to all papers above, assuming that sanctions only affect relationships between the sender and the target.

Last, this paper contributes to the growing literature on the impact of economic sanctions targeting firms. Most of this literature has focused on one precise target country. Peeva (2019) shows targeted sanctions against Russia increased votes for Putin. Draca et al. (2019) focus on Iran to show that targeted sanctions create incentive for policy change, through impact on the returns of firms. Ludema and Ahn (2024) show that firm-level sanction against Russia in 2014 heavily impacted the targeted firms, and benefited other firms. This result is contradicted by Keerati (2022) studying sanctions against Russia in 2014 and Nigmatulina (2025) studying sanctions against Russia from 2012 to 2020. My paper diverges from those two papers in two

[2]For further discussion of the features of those datasets, see Table 1 of Felbermayr et al. (2020)

[3]A recent exception is Crozet et al. (2021) studying impact on French firms of sanctions against Iran, Russia, Myanmar and Cuba. Their outcomes are related to firm's balance sheet and not trade flows though.

aspects. First, while they only study firms that are still sanctioned, I study both firms which sanctions have been lifted and the ones still sanctioned. It may be that the firms they study remain sanctioned precisely because of their increase of funds, capital and revenue researchers have documented. It is then convenient to contrast those firms to the delisted ones. Second, they focus on firms listed in programs related to annexation of Crimea and the war in Ukraine, however I show that some Russian firms can actually be found in other programs. It follows that some firms in their control groups are actually treated as well.

My paper combines descriptive evidence and empirics to estimate the causal impact of firm-level sanctions on disaggregated trade flows. To the best of my knowledge, I am the first to describe the false positive and false negative classifications, to elicit the timing of sanctions and correct for anticipation of targets.

Egorov et al. close to mine but focus on Russian sanction. "Because these approaches do not incorporate the full network of bilateral trade flows, they cannot disentangle changes in trade frictions from the general equilibrium trade responses implied by gravity models." French and Zylkin. "The effects of free trade agreements on product-level trade"

The remainder of this article is organized as follows. Section 2 describes the institutional setting. Section 3 presents and describe every feature of the FSDB. Section 4 validates the FSDB and establishes stylized facts related to the intensity of sanction and mismeasurements. Section 5 presents the empirical strategy. Section 6 concludes.

2 Institutional Context

The FSDB focuses on EU-imposed sanctions against specific entities, allowing for precise tracking of the timing of each sanction. It allows to track not only enforcement and lift of sanctions but also the period during which sanctions are threatened, as well as any breaks in sanctions. In this section, I explain the role of the EU institutions responsible for designing sanctions, providing insight into the recent developments within the EU's external affairs framework. I also describe the most complex sanction timeline found in the FSDB, using examples and/or jurisprudence to illustrate each part of the timing.

2.1 History of institutions shaping EU sanctions

The EU has been regulating the imposition of sanctions since 1993, when it established the Common Foreign and Security Policy (CFSP). Its aim has been to create a unified foreign and security policy for all member states. With the entry into force of the Treaty of Lisbon in December 2009, the European Council and the Council were designated as the bodies responsible for making decisions on the definition and implementation of the CFSP, based on the strategic guidelines

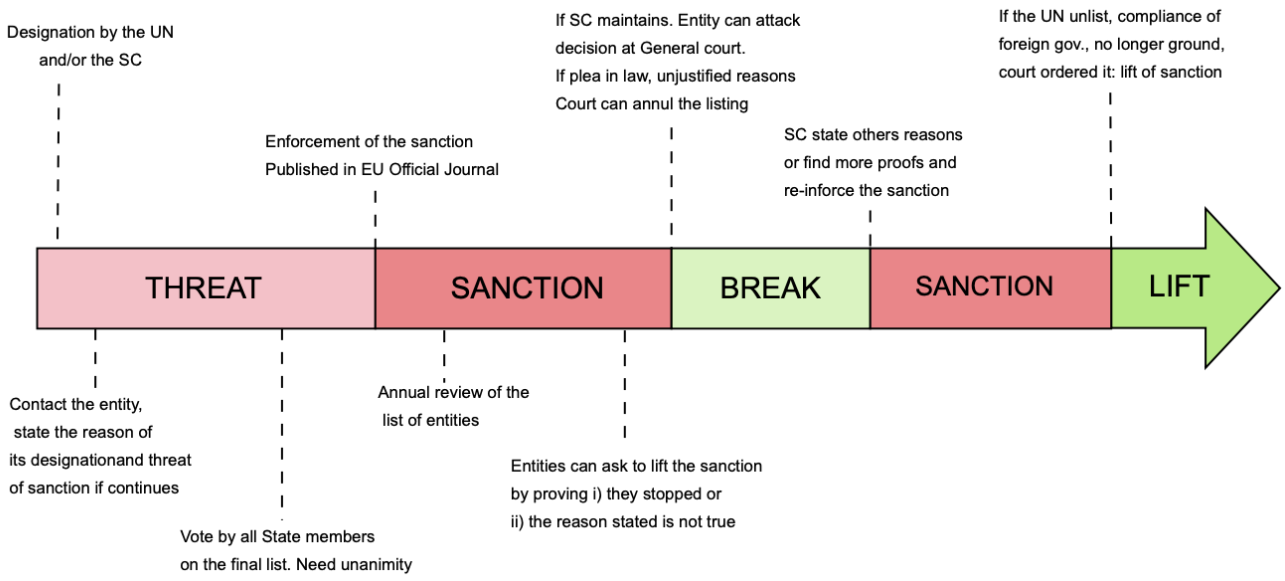
set by the European Council. In July 2010, the EU established the European External Action Service (EEAS), an autonomous institution tasked with developing the CFSP independently of the Council. The primary role of the EEAS is to assist the High Representative of the Foreign Affairs Council in managing the EU's external relations.

The CFSP guidelines are outlined in the Treaty on European Union, which sets the framework for policy definitions, decision-making, and enhancing coordination among member states. However, the General Court of the EU holds judicial authority over all CFSP decisions, including political and strategic matters, ensuring their compliance with the constitutional principles of EU law.

2.2 Timeline of EU sanctions

Based on the EEA's guidelines and the jurisprudence of the General Court, I outline the timeline of the most complex sanction scenario encountered within the FSDB.

Figure 1: Scheme of a sanction schedule enforced by the EU



Note: all variables written on top of the arrow are captured in the FSDB. All variables written below the arrow are unobserved. SC means Security Council of the EU.

Threat period. According to jurisprudence T-493/10 by the General Court of the EU, the delay between the threat and enforcement of a sanction is a legal right.[4] In this trial, the delay was deemed too short for the entity involved, which led to the relaxation of its sanction. The General

[4]In T-493/10, one can read "Where the Council intends to rely on information provided by a Member State in order to adopt restrictive measures affecting an entity, it is obliged to ensure, before adopting those measures, that the entity concerned can be notified of the information in question in good time so that it is able effectively to make known its point of view"

Court ruled that the grounds justifying the listing of the entity should be communicated directly if the address is known, or indirectly through the publication of a notice.[5] An example of such a notice of threat can be found in the EUR-lex website of the EU.

This threat may not be formulated by the EU as stated above, but by the United Nations (UN). The United Nations established in 1945 a Security Council (UNSC) to provide guidelines on entities that threaten peace. The EEA affirms that UN sanctions are automatically transposed into EU law. In practice, however, there is often a delay between the publication of directives by the UNSC and the enforcement of the corresponding sanctions in EU law. This delay gives the target an opportunity to be notified of the upcoming sanction by the EU, allowing them to anticipate and adapt during that period.

Once the list of potential sanctions is established and entities are informed of their potential sanctions, a vote is conducted across all member states. Article 31 of the Treaty on the EU outlines the decision-making process for CFSP matters. Typically, decisions require unanimous approval, although some decisions can be adopted with a majority vote of the member states. A member state may also issue a formal declaration to be exempt from applying the decision. Unfortunately, this is not captured in the FSDB: it thus assumes the sanction is applied by all member states. However, the assumption seems reasonable given that if more than a third of member states abstain from voting, or if a member state opposes the decision for "vital and stated reasons of national policy," the proposed decision is likely to be rejected. In such cases, the High Representative is tasked with finding a solution. Note that unanimity is strictly required for decisions involving military or defense matters.

Enforcement of the sanction. Once the final list is voted on, it is published in the Official Journal of the EU, and the consolidated list of sanctioned entities is updated on the website of sanction trackers[6] and sent via email to the subscriber to the newsletter. A delay may occur between the publication in the Official Journal and the official date of enforcement of the sanction. This delay, which can range from one to six days, is omitted in the FSDB to avoid anticipation. The publication date in the Official Journal is considered the effective date of sanction enforcement.

Once the sanction is in effect, the EEA is required to review the list of sanctioned entities and confirm that there are still valid grounds to maintain the sanction[7]. The reviewing has to be done

[5] In the article 19 of the consolidated decision 2010/413/CFSP, one can read "The Council shall communicate its decision to the person or entity referred to in paragraphs 1 and 2, including the grounds for listing, either directly, if the address is known, or through the publication of a notice, providing such person or entity an opportunity to present observations".

[6] See European Sanction Map

[7] In article 19 of consolidated text 2010/413/CFSP, one can read "Where observations are submitted, or where substantial new evidence is presented, the Council shall review its decision and inform the person or entity accordingly".

on a regular basis, mostly annual in practice, but can also be triggered by the target[8]. Depending on the case, the EU may either accept the target's request and lift the sanction, or reject it.

Break in the sanction. The sanctioned target can, as a final step, appeal the EEA's decision to the General Court of the EU. The entity must either present a legal plea or show that there are no sufficient grounds to maintain the sanction. For example, in case T-565/12, the General Court determined that there were insufficient grounds for the sanction and ordered its removal.[9].
The General Court then orders the EU to either i) stop the sanction at the date of publication of the Court verdict, ii) stop the sanction 10 days after the verdict, iii) stop the sanction within a maximum of 2 months following the verdict[10], iv) lift the sanction in the next amendment of the sanction program. I adjust the dates in the FSDB accordingly, based on the Court's verdict. If the verdict specifies the 2-month period and no amendment is published by that time, I record it as a break in the sanction timeline until the EU potentially reinforces the sanction. In a 82% cases, the sanction ends completely after the verdict. However, in 18% of cases, the next amendment will state the Court's decision, refine the statement of reasons, and reinforce the sanction immediately[11].

Lift of the sanction. Eventually, the sanction can be lifted either by the General Court, as described above, or through a review by the EU[12]. The EU publishes an amendment indicating that the entity is no longer sanctioned, often stating the reasons for this decision.

I collect all available information throughout this timeline, including staggered dates and the reasons stated for both listing and delisting. For transparency, I also reference every document

[8]In paragraph 8 of T-558/15, one can read "The applicant asked the Council of the European Union to review the inclusion of its name on the lists at issue, in the light of information which it had sent to the Council. The applicant also asked to be provided with the evidence justifying its listing. Lastly, it requested a hearing".

[9]In more details, the General Court lifted the sanction stating "The effectiveness of the judicial review guaranteed by Article 47 of the Charter of Fundamental Rights of the European Union also requires that, as part of the review of the lawfulness of the grounds which are the basis of the decision to list or to maintain the listing of a given person, the Courts of the European Union are to ensure that that decision is taken on a sufficiently solid factual basis. That entails a verification of the factual allegations in the summary of reasons underpinning that decision, with the consequence that judicial review cannot be restricted to an assessment of the cogency in the abstract of the reasons relied on, but must concern whether those reasons, or, at the very least, one of those reasons, deemed sufficient in itself to support that decision, is substantiated (Kadi II , paragraph 119)".

[10]This duration corresponds to the time where an appeal of the decision may be brought to the Court of Justice. See article 56 of the Statute of the Court of Justice of the European Union for more information.

[11]In paragraph 2 and 3 of Council Decision (CFSP) 2015/556, one can read "By its judgment of 22 January 2015 in Joined Cases T-420/11 and T-56/12, the General Court of the European Union annulled Council Decisions 2011/299/CFSP (2) and 2011/783/CFSP (3) in so far as they include the following entities on the list of persons and entities subject to restrictive measures set out in Annex II to Decision 2010/413/CFSP: [32 entities]. On the basis of a new statement of reasons, 32 of those entities should be included again on the list of persons and entities subject to restrictive measures".

[12]In decision 177/2012, one can read "the Sanctions Committee of the United Nations Security Council decided to remove one natural person and seventeen entities from the list of persons, groups and entities to whom the freezing of funds and economic resources should apply after considering the de-listing request submitted by this person and these entities and the Comprehensive Report of the Ombudsperson established pursuant to United Nations Security Council Resolution 1904(2009)"

from which this information is extracted. I now turn to a detailed description of all variables in the dataset.

3 Features of the FSDB

The dataset includes 3,408 entities that have been sanctioned by the EU at some point. Their information was collected mixing official public ressource in the European Sanction Map, the consolidated sanction statements of the EEA, and adding information through the archives of all amendments in consolidated texts. These entities are solely observed among those explicitly listed in the CFSP financial sanction programs, meaning I do not capture all entities that may fall under criteria applicable to a broader range of entities[13]. Furthermore, I only observe entities that have been voted on by the CFSP. Therefore, the list in the FSDB is endogenously censored by the national interests of the EU member states.

3.1 Consequences of a sanction

The consequences of a firm-level sanction are twofold. On the one hand, all texts enforcing firm-level sanctions include the statement: "no funds[14], financial assets or economic resources[15] shall be made available, directly or indirectly, to or for the benefit of persons or entities". This provision applies to every entity in my dataset, meaning it is prohibited to engage in any transactions with a targeted entity. Since the CFSP applies to all firms in the EU, European companies are forbidden from exporting any intermediate goods to the target, as well as from purchasing any intermediate goods from the target. This also extends to the target's export of final goods, which is banned. As a result, all trade flows between the EU and the targeted entity are severed as soon as the sanction takes effect.

[13] I do not capture sectoral sanctions, nor for example in Belarusian program [Article 2hb]: "It shall be prohibited to list and provide services as of 12 April 2022 on trading venues registered or recognized in the Union for the transferable securities of any legal person, entity or body established in Belarus and with over 50% public ownership". There is no concrete list associated to this article and I thus miss all those firms.

[14] The EU provides an exhaustive definition of funds. One can read in their guidelines that "funds" means financial assets and economic benefits of every kind, including but not limited to cash, cheques, claims on money, drafts, money orders and other payment instruments; deposits with financial institutions or other entities, balances on accounts, debts and debt obligations; publicly and privately traded securities and debt instruments, including stocks and shares, certificates presenting securities, bonds, notes, warrants, debentures, derivatives contracts; interest, dividends or other income on or value accruing from or generated by assets; credit, right of set-off, guarantees, performance bonds or other financial commitments; letters of credit, bills of lading, bills of sale; documents evidencing an interest in funds or financial resources, and any other instrument of export-financing

[15] One can read in the EU guidelines that "economic resources" means assets of every kind, whether tangible or intangible, movable or immovable, which are not funds but can be used to obtain funds, goods or services;

On the other hand, for almost every entities in FSDB "all funds[16] and economic resources[17] owned or controlled directly or indirectly [...] shall be frozen". As a consequence, the investments, ownership, and dividends of sanctioned entities are frozen within the EU.
However, this part of the definition does not apply to the 1,200 Burmese entities sanctioned in 2007. These entities were not sanctioned due to misbehavior, but rather because they operate in strategic sectors identified by the EU. To address this, I create a dummy variable *FrozenAssets*, which is equal to 0 for those firms and to 1 for entities which sanction also encompass an asset freeze.

The definition makes it clear that economic sanctions will directly impact directional trade flows between EU countries and the target. It will also affect investments and lending to firms, though these outcomes are beyond the scope of this paper.

3.2 Date of the threat of the sanction

Threat dates. I gather information on the designation of an entity prior to the enforcement of its sanction. Since the Security Council (SC) of the EU follows guidelines set by the UNSC, two scenarios can arise. First, the UNSC publicly designates the entity, which signals that the EU will likely sanction it soon after. In this case, I collect, when available, the date of the UNSC designation in the archives of the EU Official Journal. Second, the EU's security council may independently sanction an entity. In this case, as stated in Figure 1, the EU must inform the entity ex ante. This information is sometimes indicated in the archives. To compute the threat date for an entity, I take the earlier of the two dates between the UNSC designation date and the EU's notification date. If no threat date is available, I use the date of enforcement of the sanction by default.

3.3 Date of the enforcement of the sanction

Date of enforcement. For a sanction to be effective in the EU, it must be first made public. Therefore, every new entity designated for sanctions must be listed in an amendment of the CFSP and published in the Official Journal of the EU. Following this, a newsletter published by the EU updates all recipients. The sanction becomes effective shortly after its publication in the Official Journal. The enforcement of sanctions has varied over time and across different programs, with

[16]The EU guidelines indicate that "freezing of funds" means preventing any move, transfer, alteration, use of or dealing with funds in any way that would result in any change in their volume, amount, location, ownership, possession, character, destination or other change that would enable the use of the funds, including portfolio management

[17]The EU guidelines indicate that "freezing of economic resources" means preventing their use to obtain funds, goods or services in any way, including, but not limited to, by selling, hiring or mortgaging them.

sanctions generally being enforced between 1 and 6 days after publication. However, I do not account for this variation in the enforcement date and instead record the publication date in the Official Journal as the effective enforcement date. For the sake of transparency, I also include the reference to the text that enforces the sanction.

Date of break. One may find older date of enforcement for some entities than what indicated in FSDB. It comes from the fact that when an entity is delisted and then relisted later on, everything is for the EEA as if it was a brand new sanction. I thus introduce the columns break to obtain a precise timeline of the sanctions for a given entity. I keep track of the date and text of the amendment introducing the lift as the starting point of the break. I gather the same information for the re-inforcement of the sanction which I call end of the break.

3.4 Date and justification of the lift of the sanction

Four cases can happen for the lift of the sanction of an entity.
First, either the UNSC or the EU security council decided there is no longer ground to maintain the sanction[18]. Except for the oldest programs, where the EEA was still in the process of being established, an amendment is published to indicate that the entity has been delisted. I collect the date of publication of the amendment, along with its reference, for transparency purposes.

Second, the entity may contest the text enforcing its sanction before the General Court of the EU. If the entity wins the trial, I select the appropriate date based on the timing indicated in the court decision and provide the court decision as a reference. In other cases, if the EU successfully finds other reasons to enforce the sanction after the court ruling, I account for this by creating an end of the break. I also provide the relevant texts for transparency. If the entity loses the trial, I indicate this in a separate column. The goal of this classification is to track entities that attempt to lift their sanctions and to distinguish the reasons for which they either succeed or fail in their efforts.

Third, it may happen that the political objective of the whole program is partially achieved, and the EU lifts some sanctions to encourage this development. For example, in the case of Myanmar, entities were sanctioned due to government repression. When a referendum was held to determine the form of government in the country, the EU decided to lift sanctions on certain entities. In such cases, an amendment is published, and I record the date of publication of this amendment

[18]"In accordance with Article 1(6) of Common Position 2001/931/CFSP, it is necessary to review at regular intervals the names of persons, groups and entities on the list to ensure that there are grounds for keeping them thereon". Reasons for delisting that state "should be deleted" can thus be interpreted of a lack of grounds to continue the sanction.

as the date of lifting the sanctions, along with its reference.
Another possible political compromise is an agreement between the target country and the EU. In these cases, the target country complies with the EU's demands and requests the lifting of some sanctions in return. A notable example is the Joint Comprehensive Plan of Action (JCPOA) between Iran and the EU. The JCPOA ensured that the EU would lift sanctions on 54% of entities in the Iran program in exchange for Iran proving that its nuclear activities were solely for peaceful purposes.

However, the JCPOA has not been fully respected by Iran, and while sanctions were expected to be completely lifted by October 10, 2023, they have only been partially lifted since October 10, 2015. European firms are now allowed to trade with the identified Iranian firms, but only with a permit from the EU. This arrangement is not a complete prohibitive sanction, but it still raises the cost of trading with Iranian-targeted entities. To track these specific firms, I create a JCPOA dummy variable.

Fourth, for most of the oldest cases of sanction lifts, and some recent ones, the entity simply disappears from one consolidated text to another without an amendment being published. In such cases, I take the first consolidated text where the entity is missing as the reference for the lifting of the sanction.

For all entities whose sanctions have been lifted, I also keep track of the sentence introducing the lift of the sanction, if available. This enables me to create categories for the lifting of sanctions, grouping the reasons provided in the four preceding points, and studying their prevalence within the dataset.

The delisting of a target is not directly related to its economic activity. On the one hand, even if the sanction is costly to the target, the CFSP will not delist the entity unless it complies with the reasons stated for the sanction[19]. On the other hand, even if the sanction is directly or not, deadly to the target, it stays sanctioned[20].

[19] In T-558/15, one can read that EU sanction are costly to target, but still maintained. In that context the EU lost the trial and had to compensate the target for its loss during the 3 years of sanction "[General court] orders the Council to pay it, by way of compensation for the material and non-material damage it suffered as a result of the unlawful inclusion of its name on the disputed lists, between July 2010 and November 2013, [...] [The EU Council has to pay] damages in the sum of EUR 4 774 187.07, GBP 84 767.66 (approximately EUR 94939) and USD 1.532.688 (approximately EUR 1.318.111), plus any other amount that may be established in the course of the procedure".

[20] As an example, one can search in FSDB for Taibah International - Bosnia Offices, that is still sanctioned. The text justifying the sanction against Bosnian offices states "[It] ceased its work by decision of the Ministry of Justice of the Bosnia and Herzegovina Federation [...]. It was no longer in existence as of December 2008".

3.5 Text justifying the sanction

In order to enforce and maintain a sanction against an entity, the EU must clearly state the reasons for listing that entity. I collect reasons for sanctions at three different levels of aggregation allowing for comparisons of political outcomes between the FSDB and the literature.

Text justifying the overall program. Entities are grouped under different sanction programs. A program consists of a group of entities that either support or have taken actions that contribute to a common cause. For example, in the Iran program, an entity may be listed for supporting the government in various objectives that the EU condemns. A program is enforced by publishing a CFSP or Common Position, legal texts that impose sanctions on a broad target, typically a country. Addition of new entities to this position is done through amendments. Those amendments are then incorporated to the consolidated CFSP.
Within a program, entities may be listed in different annexes. While the consequence of the sanction is the same across all annexes, the placement of an entity in one annex or another indicates a slight variation in the primary reason for its listing. Continuing with the Iranian example: one annex may designate entities involved in the nuclear program supported by the Iranian government, another annex may list entities supporting Russia's war of aggression against Ukraine, and a third annex may include entities connected to human rights violations in Iran. This sub-categorization of reasons is crucial for comparing my dataset to the GSDB. In fact, since the first two annexes are related to concerns about different wars, and the third is focused on human rights, these three annexes correspond to three separate observations in the GSDB.

Most programs are named after a country because the primary objectives typically focus on the misconduct of a specific government. In fact, the literature datasets has only studied these country-specific programs. One reason for this is that it is difficult to associate a trade flow with a program labeled as "terrorism" or "cyber-attack". My dataset, however, includes 6 programs[21] that do not specifically target a country and details the firms in these programs in order to provide a more comprehensive view of the EU's targets. This approach ensures a more complete understanding of the geographical scope of EU sanctions.

Text justifying the listing of the entitity. Even after classifying an entity into a subprogram, the EEA must clearly describe the actions undertaken by every specific entity to justify the reason for its inclusion in the sanction subprogram. If the reason is not up-to-date, the entity can appeal to the General Court to challenge the sanction. The EEA thus frequently updates this description

[21] Three programs target terrorism, deals with cybersecurity concern, one deals with human rights infringement, one aims to stop the propagation of dangerous chemicals. They correspond to 1/4 of the total number of program and 268 entities.

through amendments, providing a precise reason for the listing of an entity. When justifying texts are updated through amendments, I concatenate both the original and updated reasons in the variable for a comprehensive record.

3.6 Names and acronym

Texts and amendments enforcing sanctions against entities are often available in all the languages spoken in the EU. Additionally, it may be the case that an entity has multiple spellings of its name or has been renamed after its sanction. I collect all possible names I encounter across amendments. However, to ensure consistency and enable matching with other datasets, it is important to identify a unique name for the entity. To do this, I retain the name most commonly used in the text justifying the sanction. If no such text is provided, I use the name that appears when the sanction is lifted. Otherwise, I take the name listed in the latest consolidated text that includes the entity.

The same approach applies to acronyms. Acronyms are important because, in the texts justifying sanctions, it is common for other entities within the dataset to be mentioned, either by their full names or by their acronyms. Therefore I need to precisely identify both.

3.7 Address(es) of an entity

To accurately identify which trade flows are impacted by the sanction, it is essential to precisely locate the targets. Addresses are often indicated in CFSP. In cases where multiple branches of an entity are sanctioned, all addresses are listed in the amendment, and I ensure to track each one. I format the addresses so that the street name, city, and country are clearly separated by commas. Not all addresses are as complete, but they all follow that structure. Additionally, I ensure that the country name is included in each address of a given entity, making it possible to precisely locate the share of multinationals affected by the sanction in each country.
To resolve inconsistencies in address formatting in the archives, I translate any addresses not available in English using DeepL. I also use Google Maps to locate addresses that lack a specified city or country, ensuring that the most complete and accurate addresses are provided. It also allows correcting for misspelled city names. To simplify more aggregated studies, I create two columns listing only cities and countries where entities are. The city and country at a same place in the list coincide, so that researcher just have to explode the dataset on those two columns to obtain the diffrent locations.

When there are address changes in the texts, I add any new addresses I come across through amendments to the existing one in the variable. If no address is provided by the EEA, I rely on two alternative sources: i) if a report by the General Court is available, I extract the location information from it and add it to the firm's record, and ii) if the text justifying the sanction

specifies that the entity is "based in" or "located in", I add that location to the address. I do not consider in texts the formulation "active in" as this can be misleading in determining which bilateral trade flows are actually impacted by the sanction, since such activities may not necessarily break the trade linkage if the firm exports to a third country.

3.8 Other characteristics

I also gather information that precisely identifies entities, serving two main purposes: i) to improve the matching of the FSDB with other firm-level datasets, and ii) to accurately describe the direct targets of sanctions.

Date of registration. In amendments, the EEA provides the registration date for some entities. While this information is sparse, it indicates dates that can be as much as 30 years prior to the enforcement of the sanction. I interpret this as the entity's creation date. However, when matching with ORBIS, it appears that the dates do not always coincide.

Registration and tax numbers. For some entities, the registration number is provided alongside the registration date. If the entity is registered in multiple locations, the EEA may list several registration numbers corresponding to each location. The same applies to tax numbers. However, this information is quite sparse and is mainly provided for entities located within the EU.

Eventually, I propose a detailed description of every variables available in the FSDB in Table 1 in appendix. Furthermore, I propose detailed discussions on contexts, assumptions and political evolution for a range of program in Appendices. Appendix E describes the Iranian program, F the North Korean one, G the one in Myanmar, H the one in Ukraine.

4 Basic facts and trends.

4.1 Validity of the FSDB

The GSDB is comprehensive: it gathers all sanction cases enforced around the world. The FSDB is much less exhaustive: it only covers financial sanctions enforced by the EU. This part tests the external validity of the FSDB. First, the EU is the biggest user of sanctions according to Felbermayr et al. (2020), accounting for 10% of all sanction cases in the GSDB. It is thus an important sender *per se*, even more so given it is a multilateral sender.

4.1.1 Comparing trends with the literature

To further comprehend if the study of the EU sanctions can provide insights at a global scale, I compare trends in sanctions observed in the GSDB with their equivalent in the FSDB. This sanity check is important because one could think that the impact of sanction on trade flows

may vary depending on the location of the targets or the political objective stated[22]. It is thus important to check the balancedness of the FSDB with regard to the number of targets, location of targets, and political objective, for the external validity of estimates.

Programs in the FSDB correspond to the scale mostly comparable to the GSDB. The FSDB encompasses 24 programs, 18 of which are also reported in the GSDB. Table XX in appendix describes the rows of the GSDB related to the program under study in the FSDB. The programs in the FSDB are not a partition of the financial sanctions imposed by the EU in the GSDB. The remaining programs corresponds to the ones where only people were targeted and no entity. Those programs are thus not included in the FSDB. Replicating the stylized facts from Felbermayr et al. (2020) with programs of the FSDB confirms that trends are preserved in this subsample.

First, the GSDB reports that sanctions have been increasingly applied over time. To verify whether this trend holds for the FSDB as well, I examine the evolution of the number of programs enforced by the EU, as shown in Figure 3b. I observe a similar increasing trend in the number of programs over time, confirming the pattern seen in the GSDB.

Second, the GSDB documents that African countries are the most frequent targets. To be comparable, I classify programs, labeling the one with non-geographical names as others. Upon examining the names of the programs, it becomes clear from Figure 3a that the EU has targeted an equal number of countries in Asia and Africa, thus supporting the claim made in the GSDB. Note that I considered the program based on their names given by the EEA. Thus the program related to the invasion of Ukraine (UKR) is classified as European. There is thus slightly more programs in Asia than in Africa when taking into account the principal target behind every geographical programs.

Third, on the political front, the GSDB shows that the objectives of sanctions are increasingly related to democracy or human rights. I create political objective based on the categories created in the GSDB. I then search for key words, explicited in Figure 4 in annex the text justifying the subprogram. When limiting to maximum three objective per program, as they do in the GSDB, I obtain that programs related to democracy and human rights are indeed an increasing component of sanctions, however the majority of programs in the FSDB relate to war concerns. This difference comes from the "war" category I create in the FSDB, meanwhile Felbermayr et al. (2020) distinguish between objectives which aim at preventing war, ending war and dealing with territorial conflict. If one aggregates those three categories, it also becomes the predominant one in the GSDB[23].

[22]For example, one could imagine that sanctions aiming at stopping war should be more aggressive than the one that aim to stop cybersecurity concerns.

[23]If one aggregate the histograms "Territorial conflict", "Prevent war", "End war", they sum to 250 sanction cases and become the main category in the GSDB

The FSDB replicates the global trends of the GSDB and its estimate should thus be representative of the overall impact of sanctions imposed globally.

4.1.2 Comparing econometric estimates

XX

4.2 New stylized facts on the intensity of sanctions

The FSDB replicates the facts from the GSDB and thus portrays correctly the extensive margins of sanction programs. The FSDB details the targets inside each program. I can thus document the intensity of sanction program and locate every entity in it on the map. Stated otherwise, I can further study the intensive margin of sanctions. All graphs referred to in this part can be found in Annex C.

Fact 1: More entities are targeted over time but programs are less intense. Leveraging the granularity of the FSDB data, I can further analyze the increase of the number of entities over time. As illustrated in Figure 5, the number of entities increases, although not in a strictly monotonic fashion. Specifically, there are instances where the EU lifts sanctions against a substantial portion of entities within a program for a period, only to reimpose sanctions later. Myanmar and Belarus are examples of such a non-monotonic pattern.

However, in figure 6a, the average number of entities per program is decreasing from 200 average entities per program in 2008 to 100 entities nowadays. The trend is similar when looking at the median in figure 6b, coming from 50 entities at the median program in 2006 to 10 entities at the median programs nowadays. The trend is thus not due to outliers. The increase of entities is thus mainly driven by an increase in the number of programs, rather than the intensification of the existing programs. This fact may be surprising given the so-called extraordinary range of sanctions against Russia in 2022. If one restricts the analysis only to the most discussed program, the intensity of programs seems to have gotten nowadays to similar levels as in the years 2010. This fact induces that the literature has focused on particularly intense programs, and may thus over-estimate the impact of sanctions.

Fact 2: Sanction programs are more intense in Asia and hitting more countries. Figure 8a, represents the precise locations of the entities in the FSDB. It shows most of the sanctioned entities are located in Asia. The discrepancy with the GSDB stems from the fact that African-targeted programs are relatively small, with fewer entities sanctioned, while programs targeting countries in Asia involve a larger number of entities. Additionally, programs that do not specifically target a

country also primarily feature entities located in Asia. As one would expect, most of the sanctions are located in the capital city of the countries as shown in Figure 7, where most of the economic activity is located.

In addition, programs are targeting more and more countries, way more than the number of different programs active. Figure 8b shows that when 24 programs are active since 2024, more than 80 countries, with at least one entity sanctioned, are actually impacted. The discrepancy has sharply increased in the early 2000's, but increased at a steady slope since 2010. It follows that the intensity of sanctions may come from countries that are not the primary target of the sanction program.

Fact 3: Sanctions against war are becoming more intense, and sanctions against governments are less intense. The authors of the GSDB state that it is not possible to rank the defined objectives with respect to their priority for every sanction cases. Given the urge for heavy sanctions against Russia following the beginning of the Ukraine invasion, it is clear that the intensity of a sanction case captures the importance put on this political objective. By doing so and averaging across sanction programs, it comes that sanctions related to war are becoming more and more intense, while the sanctions targeting governments are decreasing in intensity. All other political objectives did not see any change in the intensity of the sanction episodes

4.3 Measurement errors

To identify the effect of a treatment, econometric literature emphasized the importance of SUTVA. Leveraging the granularity of my dataset, I can examine the exact location and timing of sanctions to test respectively for the presence of polluted control group and anticipations. This enables me to test two key assumptions commonly found in the literature: i) sanctions affect trade flows solely between the sender and the target countries, and ii) parallel trends exist prior to the imposition of the sanction, which is equivalent to entities not anticipating their sanction.

Mismeasurement 1 - location: False positive location. I refer to false positive the entities that are assumed to be located within the program's designated region but are actually situated elsewhere. For instance, an entity in the Iranian program but located in Germany is a false positive. In Figure 10a, I illustrate the proportion of entities not located in the program's assigned region, relative to all entities within that program. It highlights the significance of false positives as a concern. Focusing on programs extensively discussed by the literature, such as those targeting Russia following its invasion of Ukraine (UKR), North Korea (PRK), and Iran (IRN), one sees that between 10% and 40% of entities are not located in the targeted country. False positives are a concern, on average across program and time, for 20% of entities.

Figure 10b further explores the extent of the misclassification when one assumes that only the bilateral trade flow between the EU and the targeted country is impacted by a sanction. When overlooking the precise location of sanctions in the gravity equation an average across programs of 7 countries are actually experiencing sanctions but assumed to be in the control group. For the most commonly studied programs, it follows that between 10 and 30 coefficients of multilateral resistance are incorrectly estimated.

This misclassification is relevant not only to papers examining sectoral sanctions but also to studies exploring impacts of sanctions within the sender economy. However, papers that focus on the impact of sanctions on firm-level outcomes in the targeted economy are exempt, as they typically match entities based on location.

Mismeasurement 2 - location: False negative location. I refer to false negative the entities that are assumed to be located outside of the program's designated region but are, in fact, located within it. For example, if an entity in the cyber-attack program is located in Russia, it is a false negative for the Russian program. To illustrate false negatives in the FSDB, I represent the proportion of entities in a program, whose name refer to a country p but that actually belong to a different program p', relative to the total number of entities within the country p in the FSDB. Figure 11 highlights that false negatives also represent a concern. In average, when studying programs with only-geographical names, the researcher misses around 42 entities which location is actually in another program's name. This misclassification, though quantitatively low, affects all studies examining the heterogeneous impacts of sectoral sanctions, as well as those investigating the outcomes for sanctioned firms. Indeed, firm-level studies, the control group is typically composed of other non-sanctioned firms within the economy. However, when focusing on the most studied programs, between 5% and 10% of entities are incorrectly classified as non-sanctioned.

All in all, the location misclassifications are an increasing concern as Figure 12 shows. Their increase is steady but they now amount to a fourth of entities sanctioned in the FSDB. However, the false positive is the main threat to identification of the impact of sanctions on trade flows. It thus needs to be taken into account in the evaluation of the impact of sanctions.

Mismeasurement 3 - timing: Sanctions are enforced in a staggered fashion. The GSDB reports a unique beginning date of sanctions. However, when one looks at the enforcement of sanctions in the FSDB, it appears that entities keep being sanctionned throughout the duration of the sanction. Assuming a given entity as being sanctioned since the beginning when it is actually not captures an impact that should not be associated to the impact of the sanction. If one capitalizes on the FSDB and compares the date of enforcement of entities with the date of the very first sanction in the program (which coincides with the date in the GSDB), Figure 13a illustrates that

the lag is in average around 3 years.

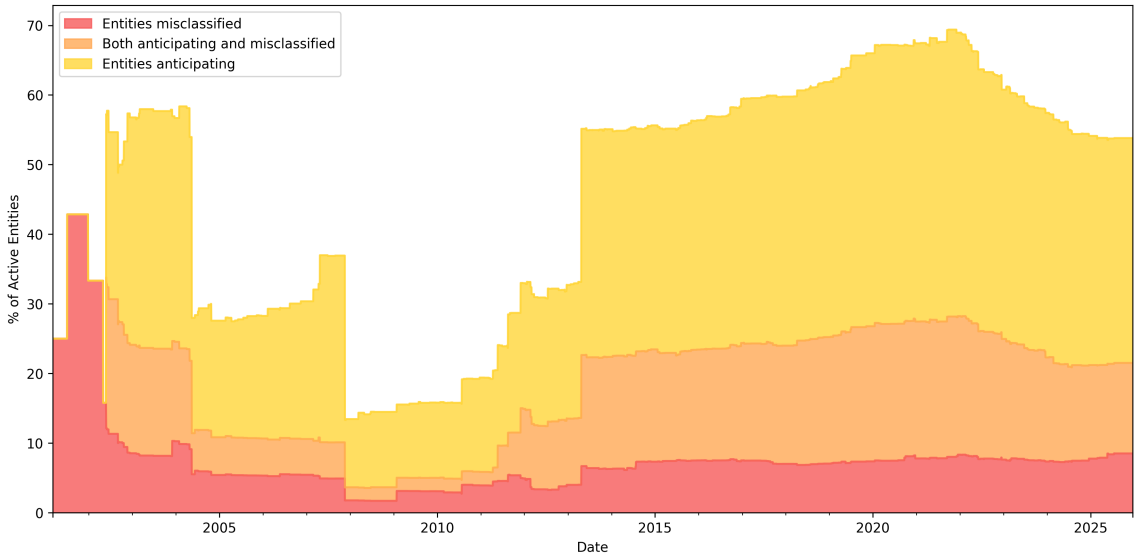
Mismeasurement 4 - timing: Anticipation of a sanction. Entities have several way to anticipate their sanction: thanks to the threat or because of the extraterritoriality of sanctions.
Threat of sanction. Since the institutional setting, it has become clear that entities can anticipate the enforcement of their sanction as soon as they are noticed. To get the extent of this anticipation, I compute the difference between the date of the enforcement of the sanction, and the oldest threat the entity has received. The oldest threat corresponds to the oldest date of designation by the Security Council of the UN and the Security Council of the EU. The result of this difference is represented in Figure 13b. The threats usually occurs months in advance, and are in average 2 months before the enforcement of the sanction. The delay is thus short and should not impact studies working with yearly data. However it may be of interest for firm-level studies.
Secondary sanction. Famous cases in the news, such that the fine imposed by the US to BNP Paribas for trading with Iranian firms have created fears of not being aligned by the sender countries and thus being sanctioned. The impact of the sanction may thus start before the actual enforcement of threat of sanction, but rather when a business partner is sanctioned. By analyzing the justifying text for the entities of the FSDB, I can create a date of secondary sanction for some entities. My measure allows for a precise study of firms that are subject to this kind of threat[24]. To determine the secondary sanction date for an entity x, I search in its justifying text for any other entity y also listed in the FSDB. To study the reasons behind the mention of other entities in text justifying the sanctions I analyze the wordcloud in Figure 14b and find that most of the vocabulary used is related to business relationship, or supply chain. If entity y is sanctioned before x, I assign the secondary sanction date of x to the threat date of y, or its enforcement date. Figure 14a presents the timelapse between the date of secondary sanction and the actual enforcement of the sanction of some entities in the FSDB. It follows that entities can anticipate their sanction several years before, with an average of one and a half year.

The anticipation of sanctions is a fast growing concern of the estimation of the impact of sanctions, as Figure 15 demonstrates. If the anticipation due to threats has started with the very first sanctions of the EU and keeps growing steadily, the secondary sanction started taking off in 2010. The threat of sanction allows around 400 entities to anticipate their sanction, when secondary sanction allows around 600 entities to anticipate years in advance. The two anticipation biases are altogether impacting half of the entities in the FSDB.

[24]It is an explicit goal of the EU. See for instance in T-493/10: "According to the case-law, when the funds of an entity identified as being engaged in nuclear proliferation are frozen, there is a not insignificant danger that that entity may exert pressure on the entities it owns or controls or which belong to it, in order to circumvent the effect of the measures applying to it". This emphasizes the explicit goal of the EU to prevent sanctions circumvention, and my measure allows for an in-depth analysis of the heterogeneity of responses across firms.

It is worthwhile considering whether those biases impact the same entities or are actually complementary. Figure 2 represents the relative importance of both biases. At every date, the share of active entities sanctioned is decomposed in three categories: the one with a location bias, an anticipation bias, or both at the same time. It appears that the two biases altogether represent around 55% of the entities sanctioned. The two biases are not mutually exclusive, and the overlap is substantial: 10% of the actual 1800 entities sanctioned are biased in location and anticipation. The location bias represents nowadays 25% of the entities and the anticipation bias is quantitatively huge and represents 50% of the entities of the entities still sanctioned nowadays.

Figure 2: Share of Entities in the FSDB which Bias the Estimate of the Impact of Sanctions



Notes: The graph represents at every date the share of entities that are a threat to the identification of the impact of sanctions. The red area corresponds to entities that have either of the two location mismeasurement, the yellow area represents the entities anticipating their sanction by either of the two measures described above, and the orange area represents entities both misclassified and anticipating their sanctions.

To further study the interplay between the biases, I study the pairwise correlations between the disaggregated misclassifications in Table 5. Most of the correlations are below 10%. One exception is the false positive and false negative which correlate. However, as Figure 12 shows, the intersection of the two is quantitatively low. Another exception of high correlation of measures is the correlation between the staggered enforcement and the secondary sanction. By construction the secondary sanctions have to be sanctioned after the first sanction in the program. This correlation is thus mechanical. It is now important to quantify the impact of those biases on the estimate of the impact of economic sanctions.

5 Empirical estimation

To assess whether the quantitative relevance of those three biases I estimate a gravity equation on all the products impacted by the firm-level sanctions. for the rest of the paper I will denote $\mathcal{I}$ the set of importers which is typically composed of European countries, $\mathcal{J}$ the set of exporters, and $\mathcal{K}$ the set of sectors imapacted by sanctions.

5.1 Data

Data on activity of firms. The information gathered in the FSDB describes entities that may either be firms, associations, ministries,... It further does not detail the activities of firms. To obtain such information, I make use of ORBIS from Bureau Van Dijk. This dataset covers the financial information of firms registered worlwide. ORBIS keeps track of entreprises as long as they are active in the business register[25] I match the two datasets on the English name of the firm, its country and its city. ORBIS attributes a letter corresponding to the quality of the match according to their algorithm. I end up with 1207 matches of firms located all around the world. In the main analysis I will only focus on the best matches having obtained the grade "A" in ORBIS matching process.

ORBIS indicates the size of the firms according to 4 categories: small firms, medium-size, big firms or very big firms. The small firms are particularly targeted and represent 72% of the sample which is surprising given that sanctions mostly act through international linkages and should thus impact firms active in international imports or exports. The very big firms are the second most common targets, representing 16% of the targets. Eventually big firms and medium size firms both represent 6% of the targets.

In this paper, I only use the NACE4 codes of primary and secondary activity of firms[26]. 53% of the entities matched do not have any information on their sector of activity. 20% of the firms are strictly operating in services, 16% are purely producing goods, and 11% are producing a mixture of goods and services. Given that this paper revisits estimation done in the trade litrature, thus focusing on goods, I will thus exploit the information for 322 firms inside of the FSDB, which corresponds to 27% of the firms having data *post merge*. Firms have an average of three different NACE codes and thus operate in more than one single industry. Figure 16 represents the number of NACE codes filled for every firms matched with ORBIS. However, the firms considered in this study are splitted in two main groups: the firms solely producing goods have generally one sector of activity, when firms producing goods and service have up to 11 different activities.

[25] See (Link)

[26] The primary NACE code is defined as the activity born by the firm that generates more than 50% of its value added. However, all NACE code are relevant to fully describe the activity of a firm. One implicit assumption of this paper is that firms do not change their activity across time. I assume they operate in the NACE codes obtained in ORBIS in 2025 since 2002.

Figure 17 presents in more details the type of activities for firms in different programs. Across programs, the activities mostly targeted are related to technology. The activity mostly targeted is wholesale and retail trade, repair of motor vehicles and motorcycles, and the activities in manufacture mostly targeted are producing basic metals and fabricated metal products or computer, electronic and optical products. More specifically, it is well known that the scope of sanctions against Russia is unprecedented, however the sanctions were, contrary to other programs, not focused on precise activities. Sanctions hit uniformly all sectors of activity. Also, sanctions against Iran mainly impacted firms producing services, especially on transportation and storage.

Description of $\mathcal{K}$. To convert the NACE code into precise goods produced, I use the conversion table provided by the United Nations. The conversion looses an additional 121 firms, which yields 201 firms having information about the goods they produce. In total 1845 different HS6 codes are impacted by the sanctions. This increase follows from the $1 : n$ match between NACE codes and HS codes in the 2002 revision. I present below some statistics describing which type of sectors are targeted by European firm-level sanctions.

Fact 4: Sanctions against agricultural and technological products are more intense. Figure 18 represents the number of firms producing the goods on x-axis, inside of each sanction program. It appears that the huge number of firms sanctioned in retail is translated to two spikes in the number of firms producing agricultural goods. Also, I find that electronical goods are an important target for sanctions. This result is in line with Egorov et al. (2025) who study export sanctions towards Russia. This is no surprise given that firm-level sanctions politically aim more and more at stopping war: they thus target technologies used on the battlefield.

To get a sense of the number of trade flows impacted by sanctions I represent the number of different HS6 codes impacted by sanction according to the program of sanction under study in Figure 19. First, given the increase in the number of entities sanctioned across time, it is no surprise to see that the number of HS6 codes impacted is also increasing. Second, even though Russian sanctions are an important part of identification, some other programs are still at play today and need to be accounted for in a quantification exercise with the gravity equation.

Fact 5: Russian sanctions have started targeting several firms producing the same type of goods at the same time. To further study how the EU imposes sanction, I represent the number of different firms producing the same HS6 goods actively sanctioned at the same time. The quantiles of that distribution, represented in Figure 20 show that, regardless of the measure of the start date of sanction, the restrictive measures have recently started hitting up to 4 firms producing the same HS6 good. This increase is mainly due to the Russian sanctions. It may come from two sources, the over-representation of the Russian firms in the sample due to the missing information in ORBIS, or from a real shift in the way sanctions are imposed. Effectively, Egorov et al. (2025) argue that Russian sanctions are unprecedented in their scopes. It may then

be that this translates in my findings.

Mismeasurement 5 - single case studies. Looking at the resulting dataset, it appears that it is indeed beneficial to study programs altogether. To test whether it is valid to study one program at a time, like what is mostly done in the literature, I investigate whether programs hit different sectors. I analyze for every HS6 codes imported by the EU how much different programs have at least one firm operating in it. Table 4 presents the results. This overlapping of sectors impacts a total of 411 HS6 codes, which is a fourth of the sanctioned sectors, and thus quantitatively relevant. Additionally, this overlaps is particularly due to firms located in Russia. However the most recent literature using firm-level data has mostly focused on the Russian program. There is thus a tradeoff between the precision of the sanctions one studies, and the quality of the data describing the economic outcomes considered.

Eventually, when assessing the number of sectors impacted by location and anticipation mismeasurement, it appears that out of 1845 sectors impacted by sanctions, 600 are impacted by either of the location misclassifications and 1150 have at least one firm anticipating its sanction.

Data on trade flows. I obtain trade flows at the HS6 codes from BACI by CEPII (see Gaulier and Zignago, 2010). This dataset exploits the double reporting of a single trade flow done by the importer and exporter to harmonize the flows reported in COMTRADE. Their harmonization procedure corrects for misreporting, difference between Cost Insurance and Freight (CIF) prices given at the export and Free on Board (FOB) prices given at the import, but also trustworthiness of the given figure. This procedure is especially relevant in the context of sanctions where one sanctioned country could report false figures to create decreasing trends. I thus obtain yearly trade flows at the HS6 level from 2002 to 2023. I select countries included in the EU and countries for all countries that have target in at least one sector. My control group is thus composed of both not-yet treated (sectors that will be sanctioned later on in other programs) and never treated (corresponding to sectors of countries that are just collateral).

When matching the FSDB with sectors to BACI, 198 sectors are lost in the match because they do not appear in BACI. The final sectors on which estimations will be done are 1648.

Fact 5: Firml-level sanctions potentially impacted up to XX.

To get an idea of the magnitude of trade flows impacted I further represent

Since the sanctions in FSDB only target specific firms, I cannot ensure whether the full trade flow will be impacted. The following econometric exercise will focus on disentangling the schemes of other firms in the sector substituting for the target. Also, note that the econometric estimate will only study one aspect of the sanction: the prohibition to import from the target. However, the sanctions in FSDB also imply a prohibition to supply the target. The flow from the EU to the target should then also be impacted.

Compare the volume of trade. Compare which sectors affected, like

DESCRIBE WHICH TYPE OF SECTORS

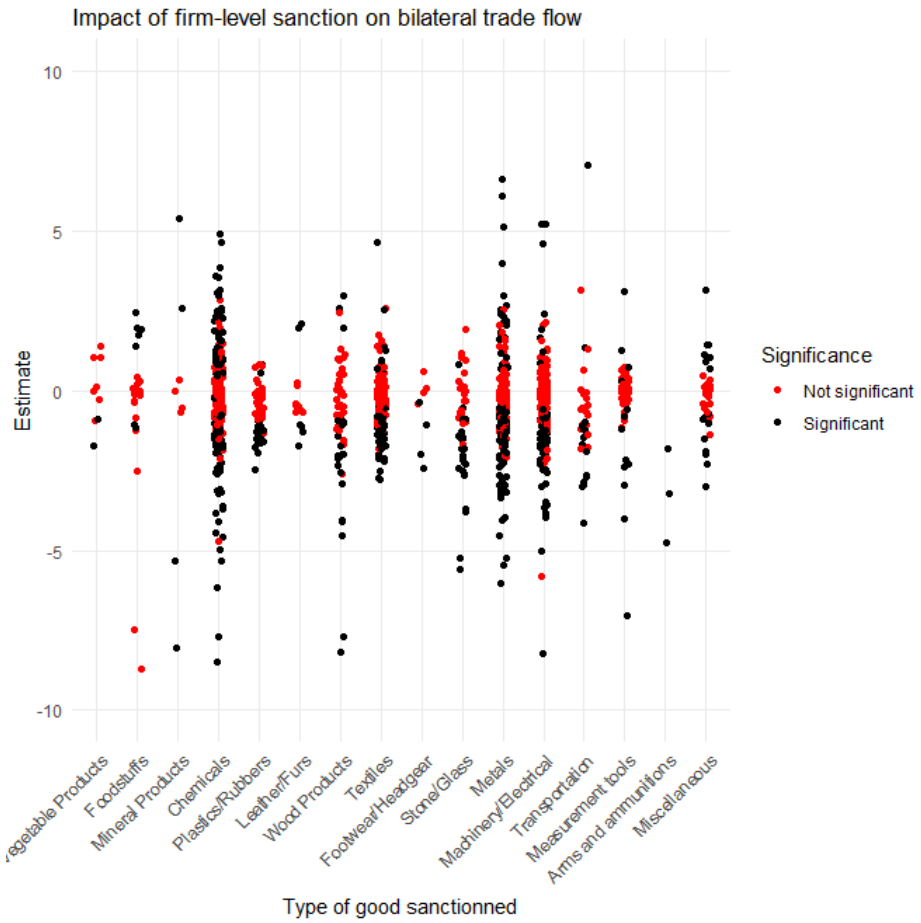
Note that given older programs do not have any justifying texts, the estimation will be on 1043 sectors for the analysis on secondary sanction. The difference between the two is mainly composed of XX sector.

5.2 Estimation strategy

I estimate a gravity equation at the sector level and gather all β_k:

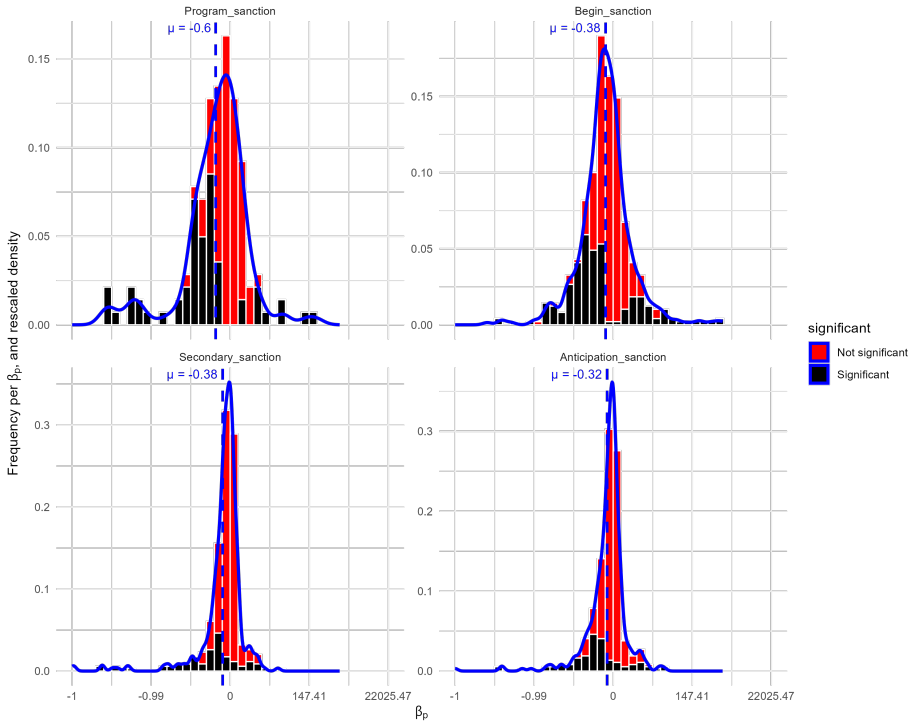
$$X_{i,j,k,t} = \exp(\delta_{i,k,t} + \gamma_{j,k,t} + \mu_{i,j,k} + \beta_k SANCT_{i,j,k,t}) \times \varepsilon_{i,j,k,t} \tag{1}$$

where $X_{i,j,k,t}$ is the export of country i to sector k in country j, at date t. $\delta_{i,k,t}$, $\gamma_{j,k,t}$ respectively control for outward and inward multilateral resistances, $\mu_{i,j,k}$ captures trade patterns that may be consistent in the bilateral relationship of countries and $SANCT_{i,j,k,t}$ measures whether there is at least one entity sanctioned by i in sector k of country j at date t. The treatment is defined as having at least one firm sanctioned in the sector k of country j at date t. In the following graph, every dot corresponds to one β_k. I gather estimates according to the HS2 category they belong to for the sake of readbility.



It appears that firm-level sanctions have very heterogenous impacts on trade flows. Reassuringly, sanctions seem to consistently and significantly decrease trade in arms and ammunitions. Estimate range from -5 (which implies a complete shut down of trade), to 5 (which implies an explosion of trade flows). Preliminary exploration in Appendix indicates that dual goods may be at the source of some positive estimates.

Now turning to the importance of anticipations, I estimate the same graph 4 different times: when the beginning of the sanction is assumed to be the very first sanction in the program (e.g. 2022 for the Russian case): this yields the top-left figure below. When one starts accounting for the stagger enforcement of sanctions, the distribution of estimates becomes the top-right one. If one restrain to the sectors where firms could anticipate sanctions along the supply chain, the estimates become the one of the second line. If the anticipation is allowed only to the closest neighbour in the graph, this corresponds to the bottom left part. If one authorizes for anticipation across the whole supply chain, the estimates are presented on the bottom right.



Note: The estimation on the first line are done on 1640 HS6 codes impacted by sanctions, meanwhile the second line is estimated on 1040 HS6 codes. Since not all firms have texts or are mentioned in one: it is then normal to loose some observations.

This graph illustrates the need for a precise accounting of the design of enforcement of sanctions. When one allows for the staggered enforcement, the estimation of impact on trade flows (exponentiated in that graph) get rid of outliers that falsely showed a complete shut down of trade. The mean estimate of the distribution becomes smaller, inducing a reduction of trade flows by 38% rather than 60% when the treatment was assumed common to all firms. Turning to anticipation, if one restricts estimate on anticipations to the closest neighbour, the estimate

are much more precise, still reflecting a decrease of trade by 38% in average, but with way less variance. Eventually, allowing anticipation across the whole supply chain, firm-level sanctions seem to decrease trade by 32%

5.3 The aggregate impact of biases

Pooled gravity equation - in the process

6 Conclusion

TBC

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ONLINE APPENDIX

NOT FOR PUBLICATION

A Details of the construction of the FSDB

A.1 Variables in the FSDB

Table 1: Description of the variables in the FSDB

Variable name	Description
AllNames	Names of entity in all langues, from its alphabet, but also English, and its acronyms
FrozenAssets	Equals to 1 if assets of entity are frozen during the sanction, 0 otherwise
Status	"ACTIVE" if whole sanction is active, 0 otherwise.
Program	Program under which the entity is listed (e.g. CHEM for chemicals, TAQA for terrorist attack)
Reason	Sentence describing the necessity of the program
Threat UN*	Date of the sanction of the entity by the UN
End UN*	Date of the end of the sanction of the entity by the UN
Threat EU	Date of the threat of the entity by the EU
Begin*	Date of the enforcement of the sanciton by the EU. It is a full date.
End*	Date of the lift of the sanciton by the EU. It is a full date, or a "." if the sanction is still active
End: reason	Sentence introducing the end of the sanction of the entity
DateRegistration	Dates of registration and/or consolidation. It may be a year, a month and year or full date, separated by a ";"
NameEnglish	English name used in most recent justifying texts
Acronym	Acronym used in most recent justifying texts
AllNames	All names and acronyms of the entity, in all languages encountered, separated by a ";"
Address	All sanctioned addresses of the entity, separated by a ";"
City	All sanctioned cities of the entity, separated by a ";". The city of the first address is in first, and so on
Country	All sanctioned countries of the entity, separated by a ";". The country of the first address is in first, and so on
JustifyingText	Text(s) stating why the entity is sanctioned, separated by a ";".
TaxpayerID	The tax numbers for every country available.
RegistrationNumber	Number on registers, and IMO of vessels if applicable
Contested*	Dates at which the entity contacted the General Court to lift its sanction
TrialVictory	Dummy being 1 if the contestation resulted in a succesfull trial, and 0 if the entity lost.
BreakBegin*	Date of the temporary lift of the sanction imposed by the General Court. If the sanction just stops, the date is in the variable End.
BreakEnd*	Date of the temporary lift of the sanction imposed by the General Court
JCPOA	Dummy if the sanction of the entity was replaced by authorized trade conditional on permits in October, 18th 2015.

Note: All variables with * also have a variable with the same name and a suffix ": text", sourcing where I got this information

A.2 Assumption done across programs

Date of threat. In the archive, it is possible that the threat date may occur after the enforcement date. This can happen when entities move from one sub-program to another. In such cases, the sanction itself does not change, but the reason for which the entity is listed is modified. In this situation, I retain the original enforcement date and simply update the sub-program to reflect the latest one.

Text justifying the listing of the entitity. In the case of an update of the texts, I concatenate the texts. If the updated text is very close to the previous version of the text, I then just merge the two. They are then indistinguishable. However, if the changes in the text are substantial, I concatenate the two texts, and split them by a semi-column. However, it may be that texts used semi-columns as punctuation, splitting the texts may thus be cumbersum.

Address. If the address is incomplete or misspelled the name of the city, or the country of one entity, I often let it as it is in the archive in the column *Address*, but change them accordingly in the columns *City* and *Country*.

B Comparaison FSDB and GSDB

Table 2: Comparaison between my dataset and GSDB.

Characteristic	FSDB	GSDB
Type of sanction	Financial sanction	All types
Consequence	asset freeze, prohibition to sell and buy in the EU	import/export or not trade related[27]
Sender	EU	EU, UN, countries
Target	entities (firm, ministry,..)	EU, countries
# of cases	3270 (24 at country level)	1102
Variables	begin (+text), end (+text) justif. text, names_firm HS, date_threat (UN + EU), address, Nb. amendment website, breaks (begin + end) JCPOA	begin, end, imp/exp, reason (arm, trade,..), objective, success
Source	Archives of EU Off. Journal	Gov. statements international press

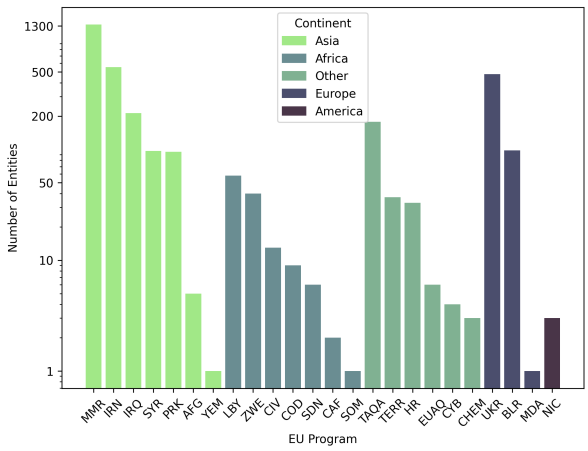
B.1 Description by the GSDB of the programs in the FSDB

Table 3: Comparaison of data for FSDB programs with their corresponding information in the GSDB.

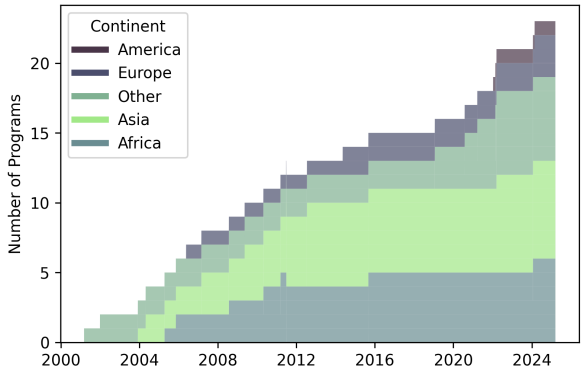
Program	FSDB	GSDB
Iran	Begin, End, Type, Political objective, success	All types
Consequence	asset freeze, prohibition to sell and buy in the EU	import/export or not trade related[28]
Sender	EU	EU, UN, countries
Target	entities (firm, ministry,..)	EU, countries
# of cases	3270 (24 at country level)	1102
Variables	begin (+text), end (+text) justif. text, names_firm HS, date_threat (UN + EU), address, Nb. amendment website, breaks (begin + end) JCPOA	begin, end, imp/exp, reason (arm, trade,..), objective, success
Source	Archives of EU Off. Journal	Gov. statements international press

B.2 External validity: stylized facts from the GSDB still hold

Figure 3: Location and Temporal Evolution of Program-level Sanction Cases Enforced by the EU



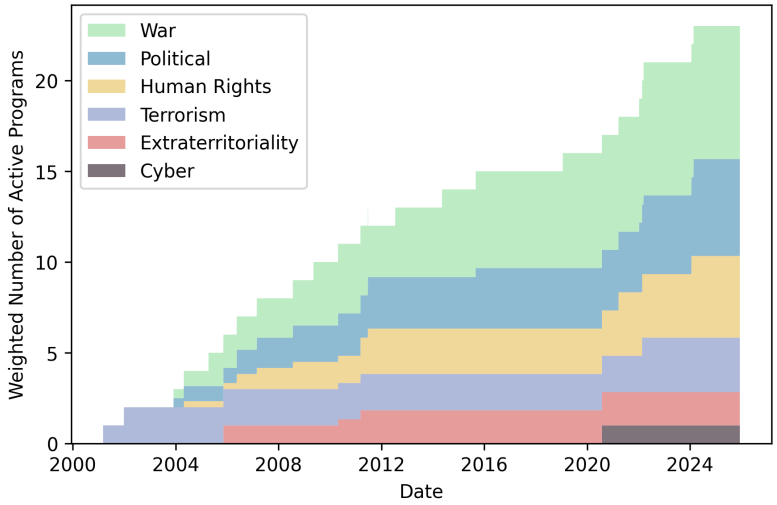
(a) Number of Entities per Program



(b) Number of Programs Sanctioned by the EU per Year

Notes: "Other" continent corresponds to sanction programs which name are not geographical: cyber-attack, terrorism, etc. One unit in the two graphs corresponds to one entry in the GSDB. *Left hand-side*: figure 3a presents a static and intertemporal repartition of the sanctions programs in the FSDB. *Left hand-side*: figure 3b shows the dynamic of their enforcement. The creation of sanction programs does not seem to have shifted throughout the history of the EEA.

Figure 4: Political Objective of Program-level Sanction Cases Enforced by the EU



Note: War is characterized by ("military", "weapon", "peace", "nuclear", "violent action"). Extraterritoriality by ("Delivery", "violating the provisions", "embargo"). Political by ("regime", "government", "President", "repression"). Terrorism by ("ISIL", "terrorism"). One unit in the graph corresponds to one entry in the GSDB.

C Stylized facts on the intensive margin of sanctions

C.1 New stylized facts

Figure 5: Number of Entities Actively Sanctioned by the EU Across Time

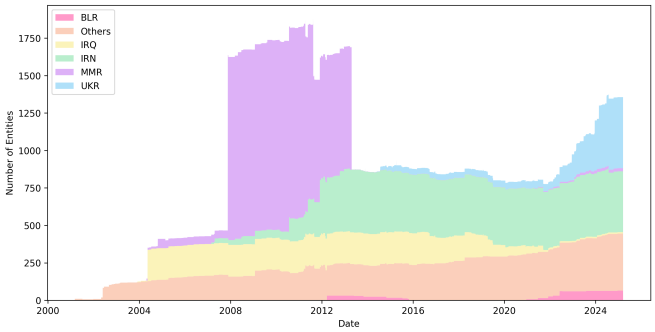
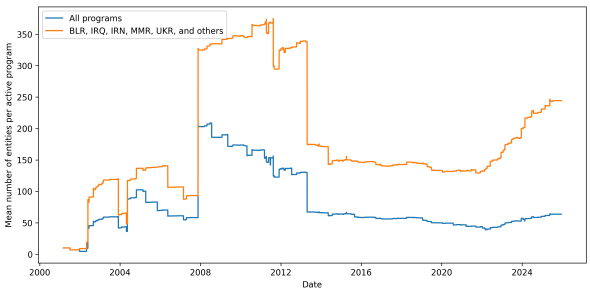
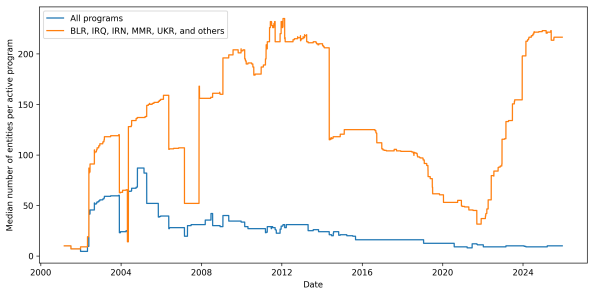


Figure 6: Metrics measuring intensity of sanctions programs on the all FSDB and on highly-discussed programs



(a) Average across programs



(b) Median across programs

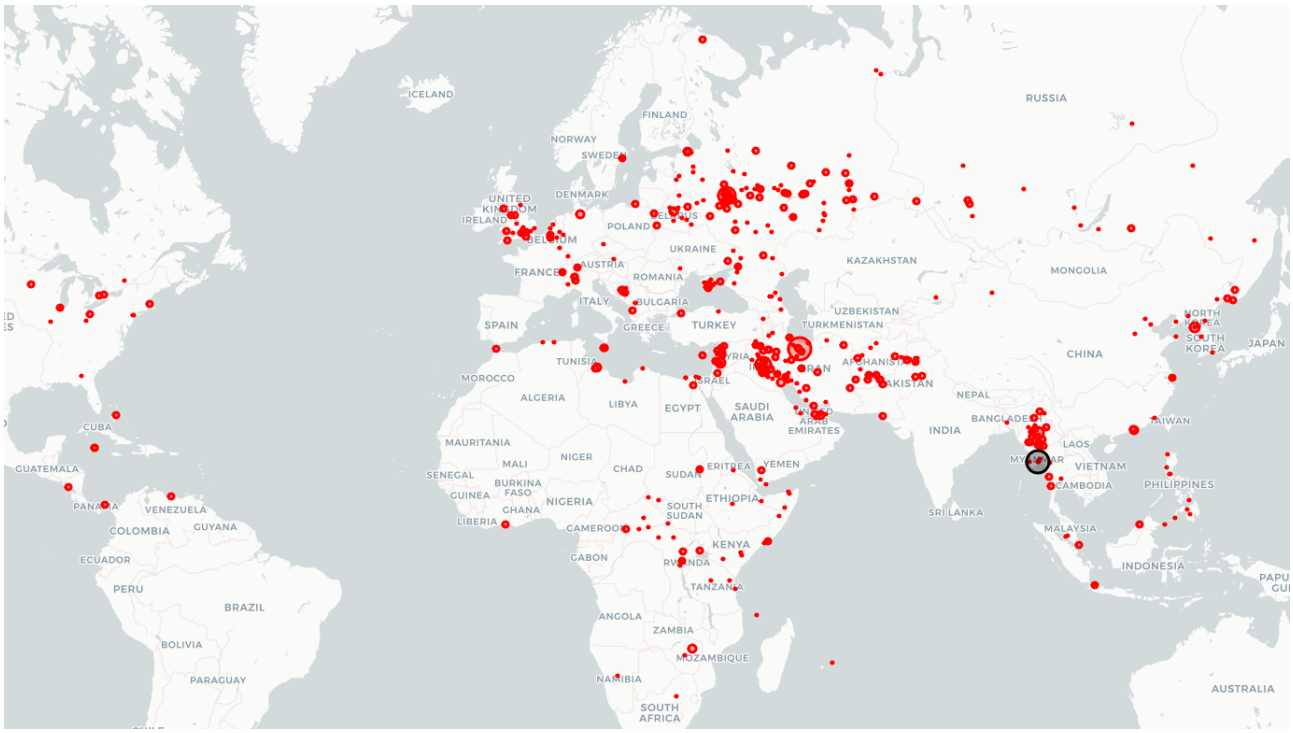
Notes: The graphs presents two metrics of the number of entities sanctionned across programs. Both figures represents a blue curve computed on the overall sample, and an orange line representing the same metric on a subsample of the programs mainly discussed in the literature.

Table 4: Number of HS6 Codes Impacted by More Than One Program From the FSDB

Program 1	Program 2	Program 3	Sectors impacted jointly
Russia	Chemical weapons	–	314
	Syria	Belarus	25
	Belarus	–	25
	Syria	–	2
Belarus	Syria	–	25

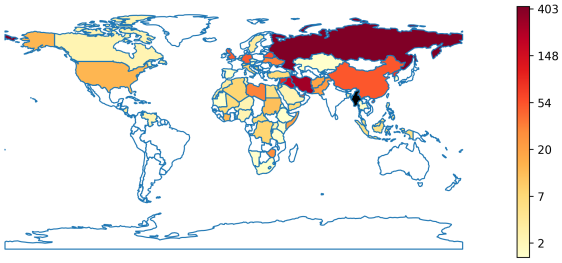
Notes: This table presents the number of sectors where a EU sanction has impacted the HS6 code. A same HS6 code can be impacted by sanctions from at most 3 different programs. The first three columns present the programs involved, and the last column quantifies the number of HS6 codes impacted. In total 386 sectors sanctioned in Russia, also have entities sanctioned in other programs. In total there is 411 sectors where there are overlaps of the programs. If one focuses on firms in one country without accounting for other programs, the control group may be polluted accordingly.

Figure 7: Map of the Location in Cities of Entities Sanctioned by the EU

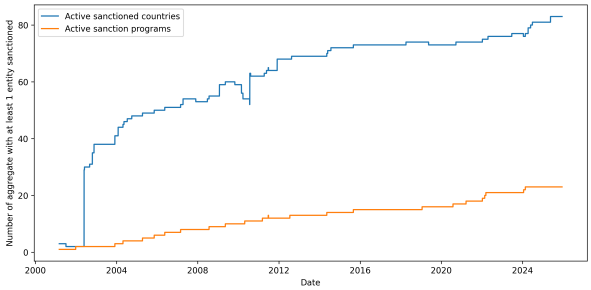


Notes: The circles are proportional to the number of entities sanctioned in every city. For the sake of readablity, the circle on the city of Yangon is maintained at the size of others, but colored in black to indicate that it is an outlier: around 1200 entities are located in it.

Figure 8: Geography of Entity-level and Program-level Sanction Cases Enforced by the EU



(a) Location of Entities Across All Programs

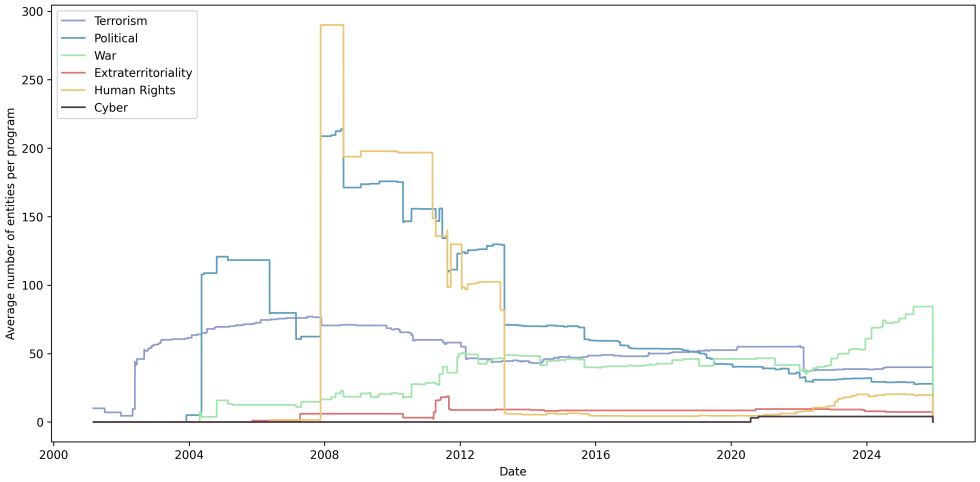


(b) Number of countries impacted and programs enforced

Notes: *Left hand-side*. Count of the number of entities in each country across time. Myanmar is colored in black to keeps the scale readable. It has had 1307 entities sanctioned. One unit in the right graph 8a corresponds to one entity in the FSDB. *Right hand-side*. The blue curve represents the number of unique countries where the entities in the FSDB locate. If two entities are in the same country but in different program, the country is counted once for a most conservative trend. The orange curve represents the number of programs active at the time for comparaison.

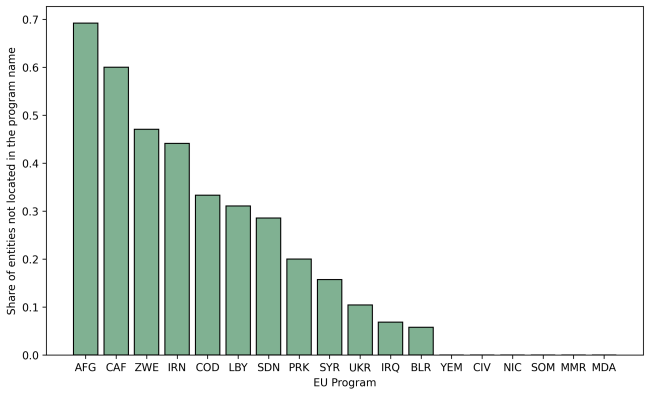
C.2 New measurement errors

Figure 9: Average Number of Entities Sanctioned Across Program Per Political Objective

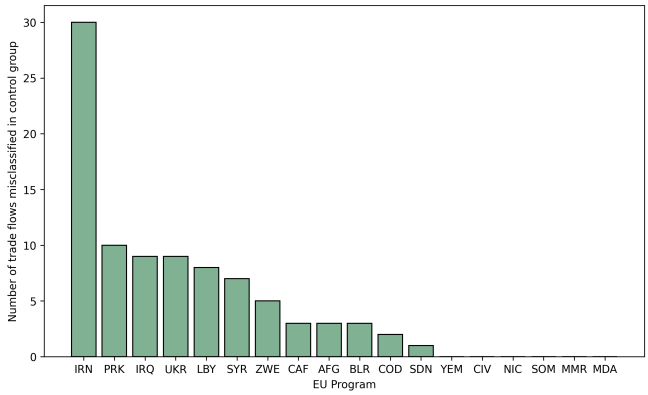


Note: For every entity of the FSDB, there are up to 3 political objective classified thanks to the text specifying their sanction. The count of entities is weighted by the number of political objective per entity. I then reweight the whole count by the total number of programs to make sure the increase is not mechanically driven by geopolitics. This graph is thus proxying the

Figure 10: False Positive Misclassification in the FSDB per Program



(a) Share of False Positives Among all Entities in a Program



(b) Number of Countries Implied Outside Program's Name

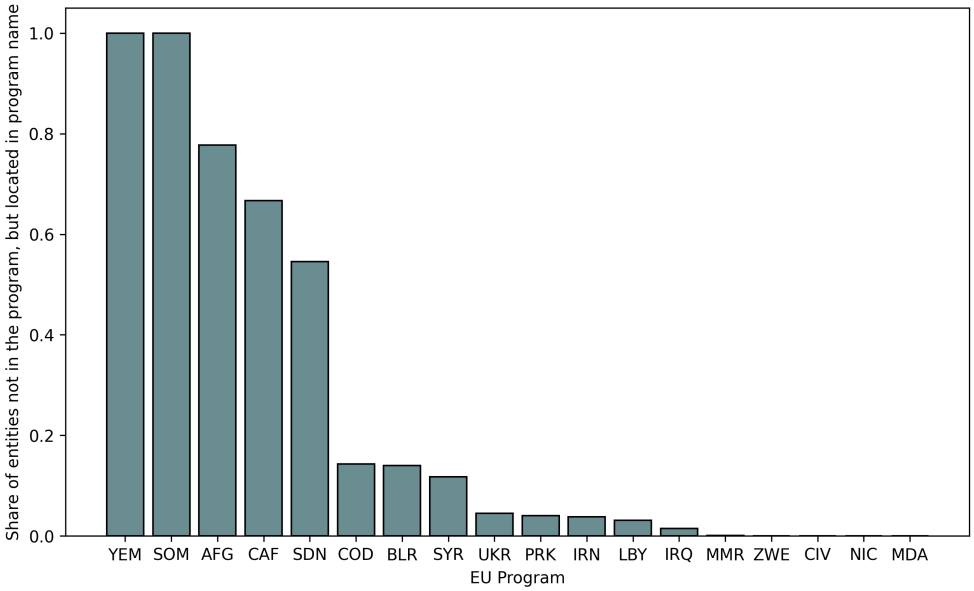
Notes: *Left hand-side.* This bar chart represents the share of entities inside of the program that are actually located in a country different from the program's name. I do not represent programs with names not associated to a country (Human Rights, Cyber,...). They are not relevant for this type of misclassification *Right hand-side.* This bar chart illustrates the number of mis estimated multilateral resistances in a gravity equation, where the only assumed sanction is the bilateral trade flow between the EU and the target country. Note: I do not represent programs which names are not a country (e.g. HR, CYB)

D Contribution to the literature

Table 6: Location and timing biases in the literature.

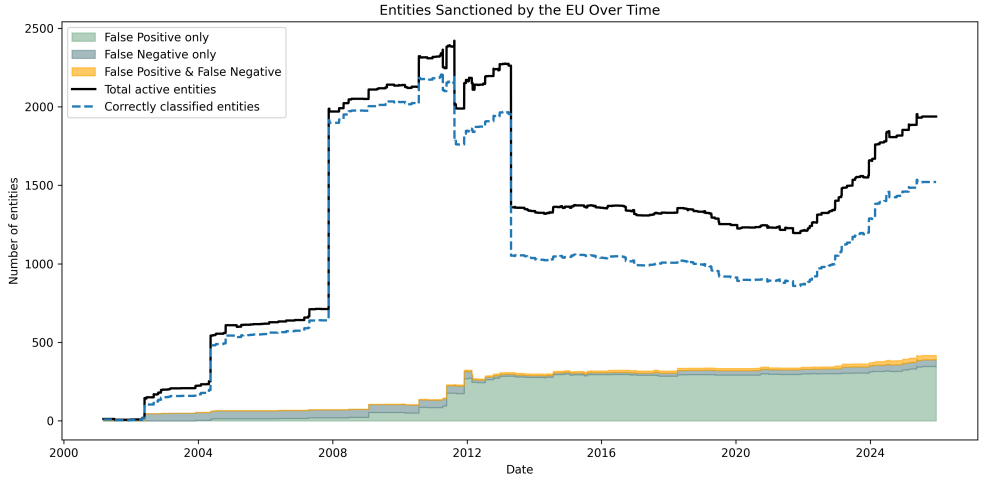
Paper	Type of sanction	Beginning of sanction	Location of targets
Ludema and Ahn (2024)	Financial sanction	Month of conflict	Program's name

Figure 11: Share of false negatives among all firms that are actually targeted in a country



Note: I do not represent general programs (e.g. Human Rights, Cyber,..), but they are at the root of this mismeasurement. The rates of false negatives close to 1 come from programs which entities inside the program c have no address indicated by the EU, but other firms located in country c are in other programs c'.

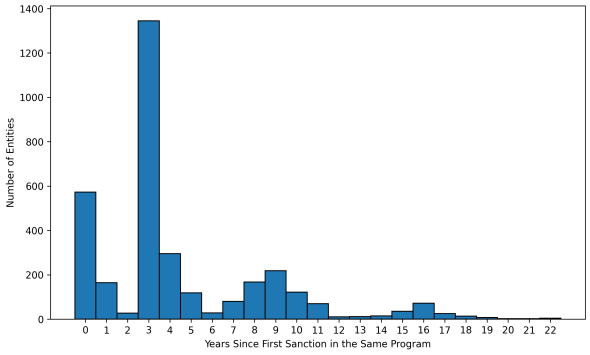
Figure 12: Number of Entities Classified with Location Misclassified



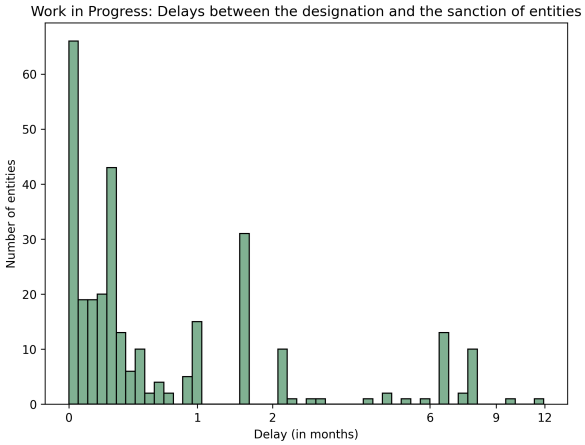
Note: This graph represent entities that would have been considered in the program's name but are actually outside of it (in green), entities that were not considered because are in a program that is not indicating correctly their location (non geographical one, or in Iranian program but located in Russia for exemple) (in bleu), both at the same time (in orange). Those 3 cases represent around 1/4 of entities in the FSDB.

D.1 Description of the sample

Figure 13: Count of the Delay of Anticipation of Sanctions by the Entities

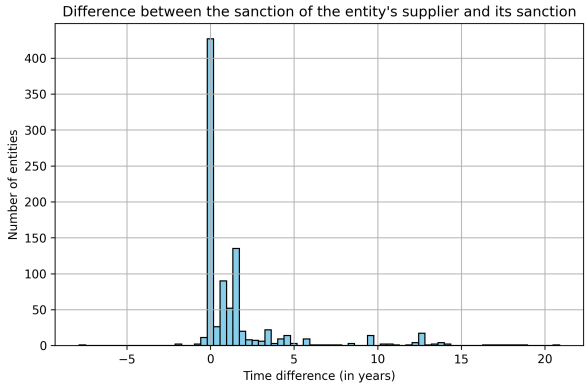


(a) Difference Between First Sanction of the Program and the Enforcement by Entity

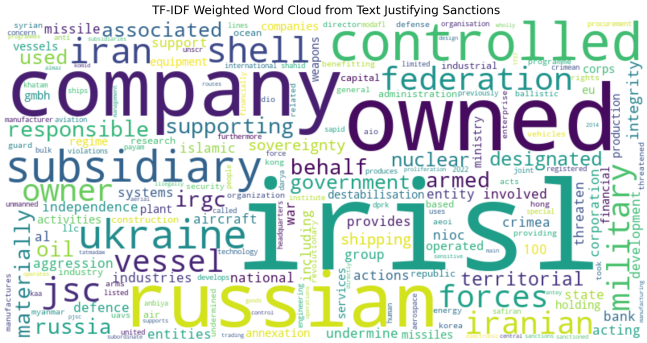


(b) Difference Between Threat and Imposition

Figure 14: Extraterritorial Sanctions in the FSDB



(a) Delay Between Secondary Sanction and Enforcement of Sanction



(b) Interpretation as Business Relationship

E Iran program

JCPOA to financial sanctions 18.10.2015 - (CFSP) 2015/1863

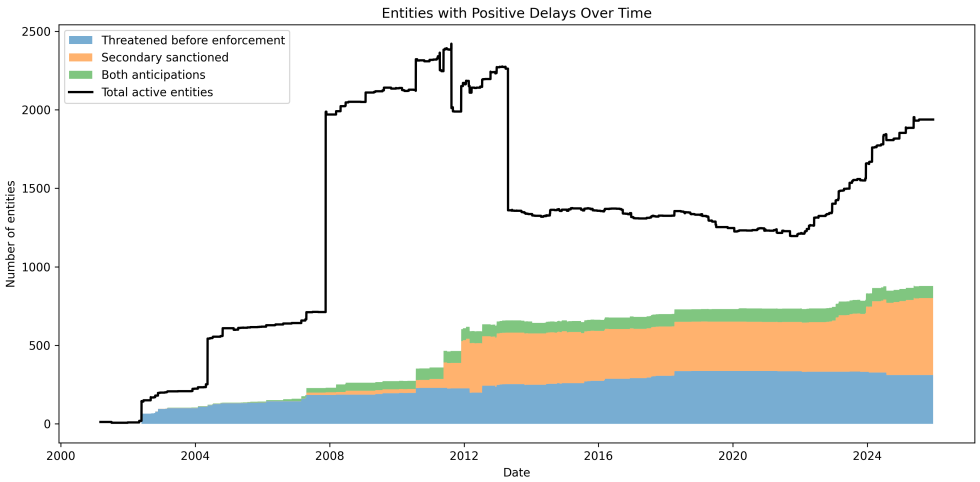
F North Korea program

G Myanmar program

H Ukraine program

Iran and EU, US,... JCPOA discussed in 24 November 2013. Agreed on 2 April 2015, in force the 14 July 2015. Then the UN has relaxed some sanctions on 20 July 2015. Eventually, EU relaxed

Figure 15: Number of Entities Anticipating their Sanction



Note: This graph represents entities that could have anticipated their sanction. The blue area coincide with entities that were threatened in advance either by the UN or the EU, of the incoming sanction. They had months to adjust. The orange area corresponds to entity which saw one their business partner being sanctioned and thus could have anticipated their sanction years in advance. The green area corresponds to entities experiencing both. They correspond to a large share of the sanctioned entity: around 1/2 of today's sanctioned entities.

Table 5: Pairwise Correlations Between Sources of Mismeasurement

	False Positive	False Negative	Threat	Secondary Sanction	Staggered
False Positive	1				
False Negative	0.24	1			
Threat	0.09	0.15	1		
Secondary Sanction	-0.06	0.06	-0.02	1	
Staggered	-0.01	0.03	0.01	0.44	1

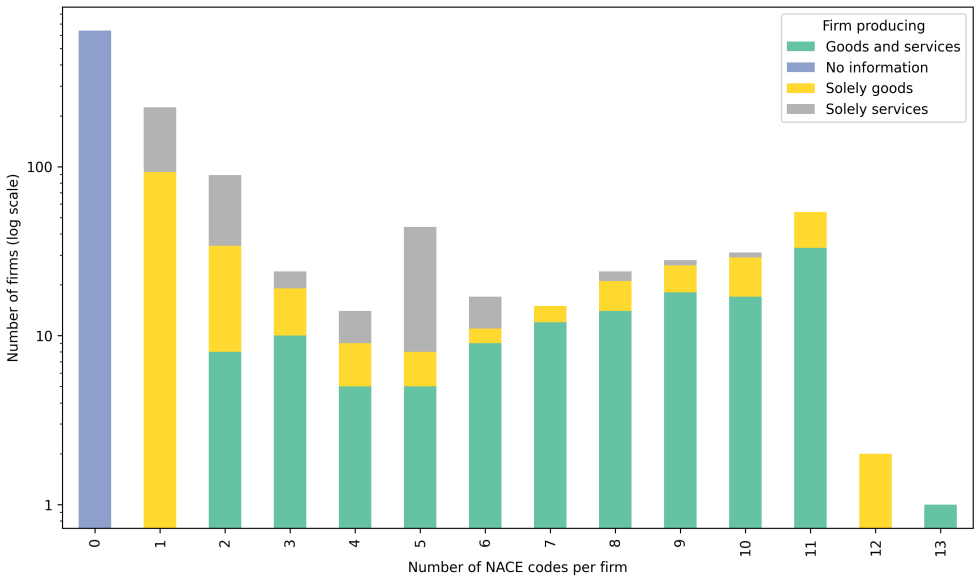
some sanctions (to fully prohibitve to necessiting a permit) on 18 October 2015 More details: https://eur-lex.europa.eu/legal-content/EN/TXT/?uri=celex

I put a JCPOA dummy: if you have JCPOA =1, you are listed in Annex V or VI and then you are not sanctioned anymore, however firms needs an agreement from the official state to trade with you, so there is still an administrative cost. To see the effect on annex IV and VI, one should retrieve Article 26(4) and 26(5) in the consolidated 2010/413/CFSP

"The JCPOA, as endorsed by UNSCR 2231 (2015), provides in particular that the Union is to remove the restrictive measures in place against certain persons and entities on 'Transition Day' (18 October 2023), which is the date 8 years after 'Adoption Day' (18 October 2015), or at an earlier moment on the basis of a report from the Director-General of the International Atomic Energy Agency (IAEA) to the IAEA Board of Governors and in parallel to the UN Security Council stating that the IAEA has concluded that all nuclear material in Iran remains in peaceful activities ('Broader Conclusion')." ((CFSP) 2016/609)

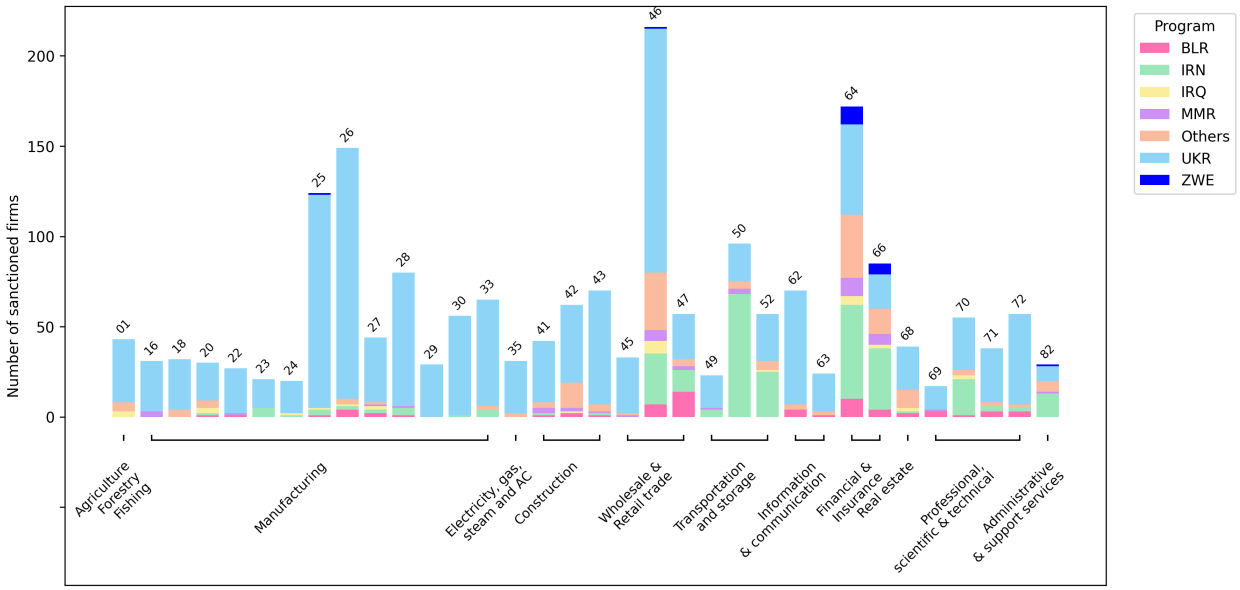
BEforehand on the 25.11.2014 "As part of this first step, Iran would undertake a number of voluntary measures as specified in the Joint Plan of Action. In return, a number of voluntary

Figure 16: Distribution of NACE codes per firm by category



Note: This graph represents the number of entities having more of less NACE code. The type of firms is represented by the color. In average firms have 2 NACEs coded filled in ORBIS.

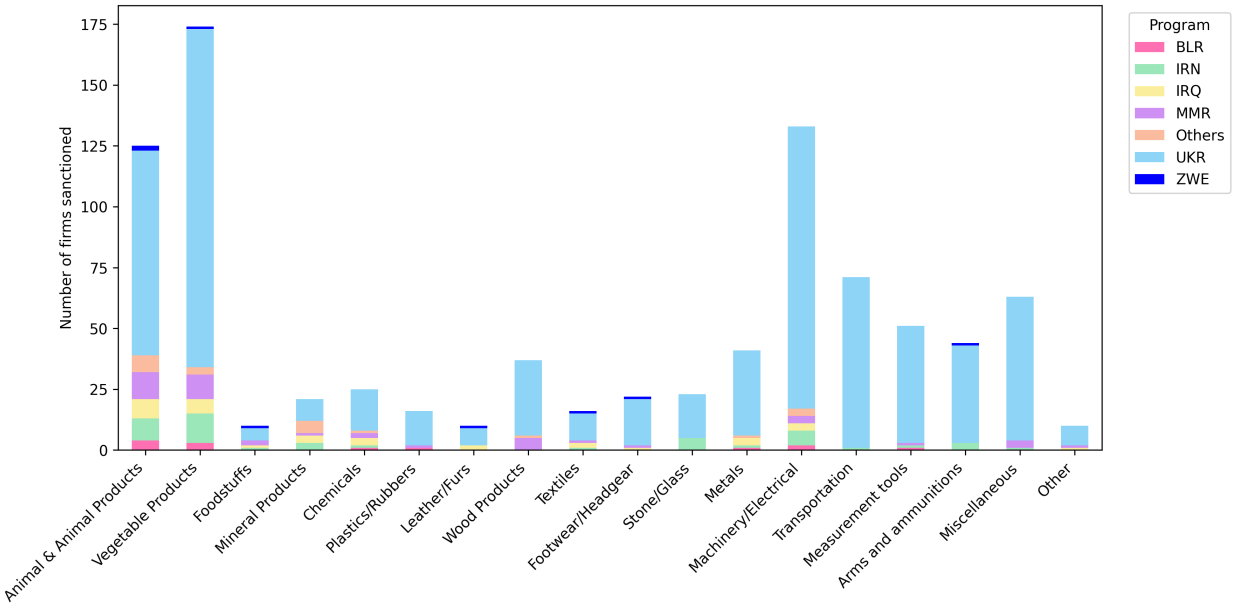
Figure 17: Number of Firms By NACE Rev 2 Header



Note: This graph represents the number of firms being at least in one sector of the NACE header represented. The figure with 2 digits on top of the bar corresponds to the precise header represented. A firm can be counted in two different bars, but is only counted once inside of each bar. The colours inside the bars represent the program of sanction in which the firm counted is listed.

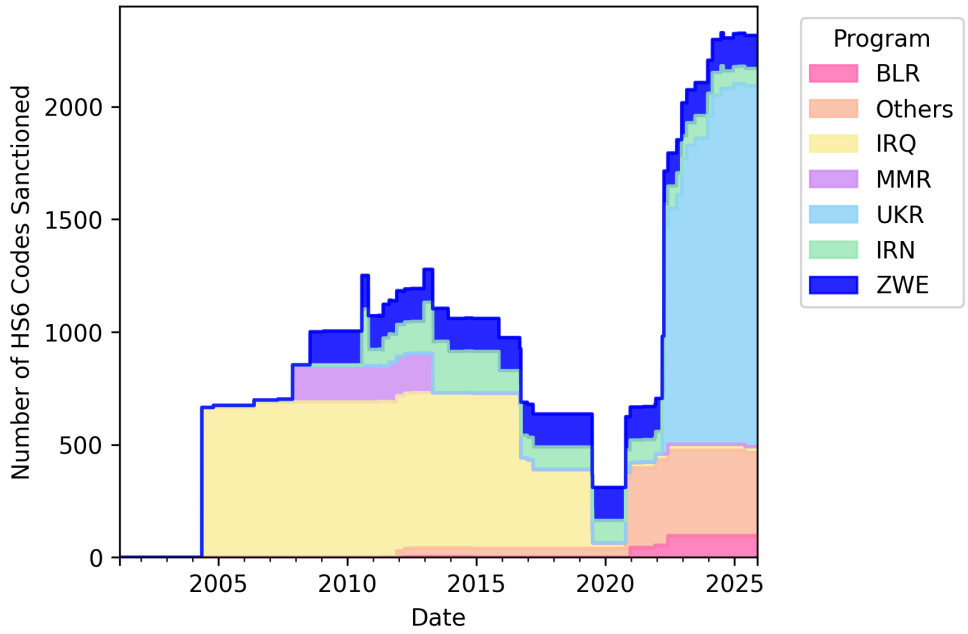
measures would be undertaken which would include, for the Union, the suspension of restrictive measures concerning the prohibition on the provision of insurance and reinsurance and transport for Iranian crude oil, the prohibition on the import, purchase or transport of Iranian petrochemical products and on the provision of related services, and the prohibition on trade in gold and precious metals with the Government of Iran, its public bodies and the Central Bank of Iran, or persons

Figure 18: Number of Firms Driving Estimations By HS2 Code



Note: This graph represents the number of firms producing at least one HS6 good inside of the HS2 code represented. A firm can be counted in two different bars, but is only counted once inside of each bar. The colours insie the bars represent the program of sanction in which the firm counted is listed.

Figure 19: Dynamic Evolution of the Number of Unique HS6 Codes Inside Every Program

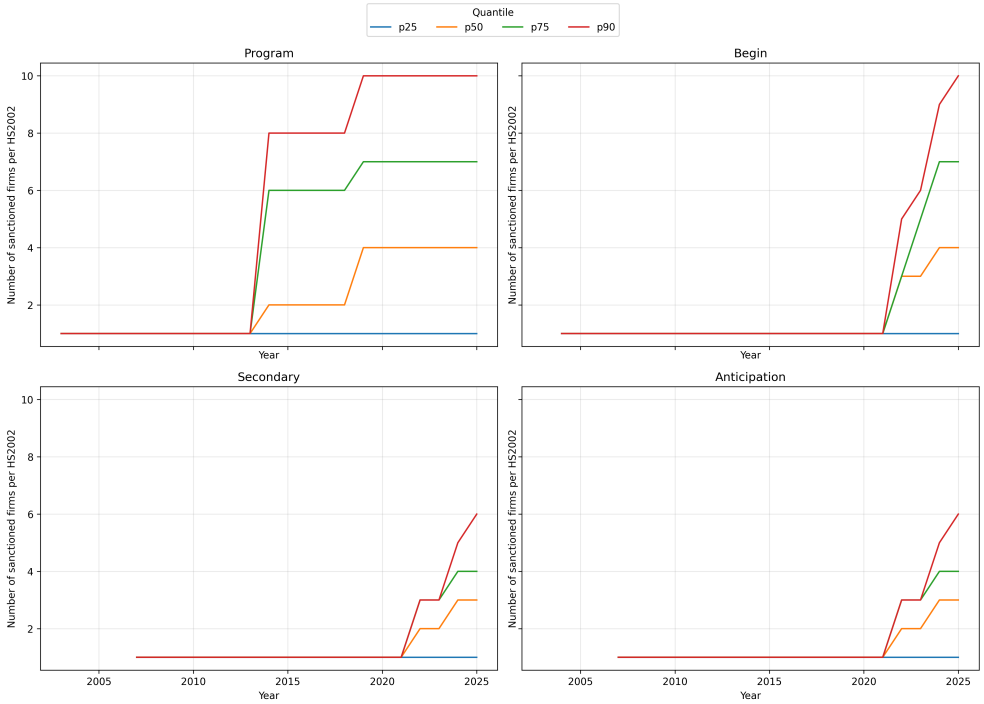


Note: This graph represents the number of HS6 codes (Revision 2002) targeted inside of each program. A same HS6 code is only counted one time inside a program, but can appear 2 times if it is targeted in two different programs. It explains the numbers on the y-axis that can be higher than 1845. The difference of scales between Figure 18 comes from the fact that a firm can operate in several HS6 codes inside a HS2 header. It would thus be counted only once in Figure 18, but several times in this graph.

and entities acting on their behalf. The suspension of those restrictive measures would last for a duration of six months during which the relevant contracts would have to be executed"

JCPOA: makes the sanction go from fully prohibitve to partial (in the sense that it adds an

Figure 20: Dynamic Distribution of the Number of Different Firms Targeted and Operating in the Same HS6 Codes



Note: This graph represents the quantiles of the distribution of the number of different firms targeted altogether by a country i in a same HS6 codes (Revision 2002) in a country j. This plot only considers active sanction, which explains why the minimum of the distribution is always at one: there is always at least a firm sanctioned in the HS6 code. The four graphs redo the saùe exercise but with different start date of the sanction. Those 4 variables will be included in the regression, it is thus convenient to understand where does the variation comes from for each. It appears that nowadays several firms operating in the same sector can be sanctionned at the same time.

administrative cost)

North Korea:

When date of threat is posterior to the start of the sanction, this corresponds to entities that were sanctioned in a different appendix (6.2.a or 6.2.b) and were moved later on to appendix IV. However both of those appendices deal with freeze of fund and prohibition to make economic ressources available. I thus only keep the earliest date of listing. Two entities are still sanctioned but are flagged as authorized for humanitarian reasons. I flag the date where the lift of sanction (in trade term) happens as the end date of the sanction.

Myanmar: I add 1206 firms that are listed precisely inside sectors sanctioned in 2007. I notice some of them have exactly the same name and work in the same industry. I assume they are the same firm with different locations to be conservative on the number of firms sanctioned. Yet if the sanction is lifted for some addresses and not some others, I resplit the firms into several entities. However it is to note that some firms in the legal text 2007/750/CFSP have several addresses listed. So, if we strictly follow the legal text, it may be that there exists several firms inside a sector in Myanmar with the exact same name. I can provide a dataset distringuishing between those firms for the one interested.

The text precises:

"The sale, supply, transfer or export of relevant equipment and technology destined for enterprises in Burma/Myanmar that are engaged in the following industries, by nationals of Member States, or from the territories of Member States, or using vessels or aircraft under the jurisdiction of Member States shall be prohibited whether or not originating in their territories: (a) logging and timber processing; (b) mining of gold, tin, iron, copper, tungsten, silver, coal, lead, manganese, nickel and zinc; (c) mining and processing of precious and semi-precious stones, including diamonds, rubies, sapphires, jade and emeralds."

The 1206 firms added are precise examples working in timber, gold, silver, jades, diamonds.

However, the text also adds this article: "The purchase, import or transport from Burma/Myanmar into the Community, of the following products shall be prohibited: (a) round logs, timber and timber products; (b) gold, tin, iron, copper, tungsten, silver, coal, lead, manganese, nickel and zinc; (c) precious and semi-precious stones, including diamonds, rubies, sapphires, jade and emeralds."

It thus seems that there is an overlapse between firm-level and sectoral sanctions in that case.

BE CAUTIOUS with those firms. It happens that some firms with exact same name and address are in two different categories (expl. gold and silver). It may just reflects that they are multi-product firms. However there are some release of sanctions for those firms for one product but not the other. I keep them separated in the dataset even though I suspect they may be the same firm. When counting the number of firms sanctioned, I need for those firms to reaggregate the firms with the same name and addresses and take the oldest lift of sanction possible (I consider only full ban). However there are of importance because they are an example of a partial import ban (from the point of view of Domestic) against a firm. The firm is sanctioned in some sectors of its activity but can still trade with the EU some goods.

All firms from Zinc and Zinc work, and SILVERSMITHS AND SILVERWARE released at the same date on 16.8.2011

First program is a success because in 2013:

"In view of the developments in Myanmar/Burma and as a means of encouraging positive changes to continue, all restrictive measures should be lifted with the exception of the arms embargo and the embargo on equipment which might be used for internal repression"

Ukraine : In tax number I put either taxpayer number, KPP or INN which seem identical in some cases. For registration number, I either take the registration number and/or the OGRN. When both are available, they coincide perfectly.

Afghanistan: When only the province is given in the address, I infer the city as being the capital of the province.

I Exploring heterogeneity of estimates