

Dataset Documentation for the Ukraine Support Tracker: Definitions, Sources, Methods

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1. Introduction

Russia's attack on Ukraine has caused staggering human suffering and destruction. Since the full-scale invasion started, many Western leaders have pledged to "stand with Ukraine" and announced major military, financial, and humanitarian support. We asked the question: What do the numbers say? How large is support for Ukraine? Who are the most supportive governments? And what type of support do countries offer – military, humanitarian, and/or financial aid? To answer these questions, we created the "Ukraine Support Tracker", which, using public and official documentation, lists and quantifies donor government support to Ukraine.

In this dataset documentation file, we describe the methodological approach behind the data, which tracks donor government support to Ukraine since January 24th, 2022 (the day several NATO countries put their troops on alert). The approach was first formalized in "The Ukraine Support Tracker: Which countries help Ukraine and how?" (Trebesch et al., 2023) to document the first year of Ukraine Support Tracker data collection efforts and results. As donor government support has evolved over the course of the war, from ad-hoc, short-term assistance to institutionalized frameworks, the methodology has adapted accordingly. We outline here a detailed explanation of "version 2" of the data collection underpinning the Ukraine Support Tracker.

In the first iteration of the Ukraine Support Tracker, we focused on providing a comprehensive "consensus" dataset, built on the systematic comparison of official donor information and reliable news media. This filled an important gap in the early stages of the war, as reported information was often contrasting, and a standardized approach for consolidating data on aid to Ukraine was missing. Furthermore, aid to Ukraine in this period was characterized by emergency coordination of pre-existing resources. The methodological challenges were therefore related to the careful selection of reliable sources, based on researcher experience, and the subsequent de-duplication of a large set of information. From 2023, because of increasing donor government transparency and the availability of more detailed sources, these challenges were mitigated. However, international coordination has led to more complex aid projects, which provide financing years into the future and cover multiple strategic areas. These changes motivated the need for an updated methodological approach. In this latest version we provide 4 major innovations: (i) precise definitions on sources and aid flows for coders and users of the data, (ii) an increased use of official sources, (iii) a set of well-defined coding procedures to minimize double-counting, and (iv) significantly improved granularity.

The Ukraine Support Tracker follows in the footsteps of similar work among foreign aid scholars and practitioners, which leverage open-source information to compile project-level aid data. We build primarily on the work of Horn, Reinhart and Trebesch (2020), which traces 200 years of international support via government-to-government loans and grants in major wars, financial crises and natural disasters worldwide. We also adopt many of the principles employed by other aid trackers such as the TUFF methodology (Custer et al. 2023), the UN OCHA Financial Tracking Service, and the International Aid Transparency Initiative. However, our work differs in two significant ways. First, we collect data in real time. This has implications on the type of flows we are capturing and on the associated coding difficulties which arise from this. Second, we cover bilateral, official aid in a broad sense. This includes military aid, which differentiates us from many of the available datasets and from accepted definitions of aid. Notably, this has significant implications on the comparability of our data with counterpart data.¹

¹ For example, the report from the Swiss Department of Foreign Affairs: [Département fédéral des affaires étrangères DFAE \(2023\). Soutien à l'Ukraine : différences entre les dépenses APD et le Kiel Tracker.](#)

This dataset documentation is divided into three main parts. First, it provides a detailed description of the Ukraine Support Tracker dataset elements, from the overarching scope to explanation of specific sources, definitions of aid types and flows, and core measurement practices. Then, it provides an exhaustive explanation of the research methodology, from collection of raw data to data enrichment with additional sources, to the final data cleaning and evaluation. The last section provides practical guidance on using the dataset, including a full codebook with definitions and explanations of the Ukraine Support Tracker dataset variables.

2. Quantifying Support to Ukraine

The Ukraine Support Tracker aims to list and quantify donor government support to Ukraine. The methodology laid out in this document therefore distinguishes the intent, range, measurement approaches, and caveats of data collection. We collect information from 41 bilateral donor countries, including all 27 EU member countries, the (remaining) G7 countries, plus Australia, China, Iceland, India, New Zealand, Norway, South Korea, Switzerland, Taiwan, and Turkey. In addition, we track support from the European Union institutions meaning the European Commission, European Council, and the European Investment Bank (EIB). Our data starts on January 24th, 2022 (the day several NATO countries put their troops on alert), and provides daily tracking of pledged, committed, and implemented aid. This allows us to see both the evolution of political support to Ukraine, as well as the rollout of aid projects over time.

The goal of this dataset is to create a comprehensive, high frequency, and systematic aggregation of (official sector) committed and implemented aid activities in support of Ukraine. By comprehensive, we mean capturing all relevant financial, humanitarian, or military aid activities by donor countries. These activities we monitor correspond to a broader set of aid projects than similar datasets, which typically focus on one of these dimensions. However, this allows us to capture support to Ukraine in the most complete way possible. We also report committed projects and subsequent implementation in real time. This distinguishes us from traditional aid-tracking approaches, which either rely on ex-post information from published documents or on donor self-reporting to centralized datasets.² In order to report this information accurately, we undertake a set of rules for defining and quantifying support, which leads to a systematic aggregation of data over time.

In this section, we explain the core parts of our data collection procedure. The principal challenges include defining the dimensions of support which should be tracked, capturing the full range of support, and accurately classifying support across the different dimensions to make meaningful comparisons. In the first part we define the scope of the dataset, or in other words, the intent which is captured by the various measures of support employed in this dataset. In the second part, we describe the source of aid in our data, including donor countries, aid channels, and other elements of the aid delivery pipeline. Then we define the core types of aid we capture. Finally, the last part classifies the type of aid flows and various measurement and accounting practices.

2.1 Scope of the dataset

The Ukraine Support Tracker provides high frequency data on bilateral, official sector, direct support to Ukraine in the form of financial, humanitarian, or military aid. *Bilateral* is aid that is provided directly

² For example, the OECD reports Official Development Assistance (ODA) flows from [donor reports](#). The UN OCHA Financial Tracking Service (FTS) uses [data self-reported by donors](#).

from one country to another, in this case, from donor countries to Ukraine. This excludes aid or donations to neighboring countries such as Moldova or Poland. We consequently do not include support extended between fellow NATO members.³ *Official* refers to aid that is provided by government entities or public sector institutions, such as national governments, ministries, or public agencies. As such, we do not count donations by private individuals, companies, churches, non-governmental organizations (NGOs), or international organizations such as the United Nations.⁴

Direct support refers to aid activities that provide goods, services, or financial resources to Ukrainian recipients. This encompasses both transfers to Ukraine's official or private sectors as well as funding for procurement activities undertaken by donor countries that result in the delivery of goods or services to Ukraine. For instance, if a donor finances a domestic firm to construct infrastructure in Ukraine, this would be considered direct support. Conversely, measures like export subsidies or investment guarantees for donor firms are excluded. We also exclude refugee costs sustained in donor countries or weapon replacement costs resulting from donations to Ukraine.

Where possible, the dataset provides detailed information on these activities, both planned and carried out. We capture this information in different metrics, namely commitments and allocations. We define *commitments* as declarations of future support by donor governments to Ukraine. The commitments we measure represent the official stance of the donor government. These do not always correspond to commitments understood as a legal obligation between donor and recipient country.⁵ Rather the official nature of these commitments is verified through data sources such as official communiqués or documents traceable to a donor government ministry or agency. This includes examples such as Framework Agreements, Memorandums of Understanding, security agreements, pledges in the context of donor conferences, or other high-level signals of political intent.

When these commitments do materialize into transfers of aid, we code them as allocations. *Allocations* are aid activities which have been then designated for a more specific purpose and have already been delivered or are specified for delivery. Allocations include technical agreements, procurement contracts, project plans, etc. Furthermore, allocations can be a subset of previous commitments. For example, a security agreement can be followed by multiple government actions such as donations from the ministries of foreign affairs and defense that realize that initial declaration of political support.

Figure 1 gives a stylized representation of the different aid activities we track. Commitments are made at the “executive” level, by heads of government or state through international agreements or declarations at donor conferences. This support is captured in pledges and documents such as the security agreements signed by Ukraine, for example those with Norway or Belgium.^{6,7} Allocations are made by ministries, agencies and other government bodies that enact the high-level political commitments. These are government actions that occur further down the aid delivery pipeline.

³ Whenever we are unable to disentangle the aid sent directly to Ukraine's government from aid sent to neighboring countries, we assumed upper bounds and reported the total value of the aid for Ukraine. One example is the US commitment of \$13.37 billion in vital economic and budgetary support for the government of Ukraine. This aid package also includes assistance to other countries impacted by the situation in Ukraine.

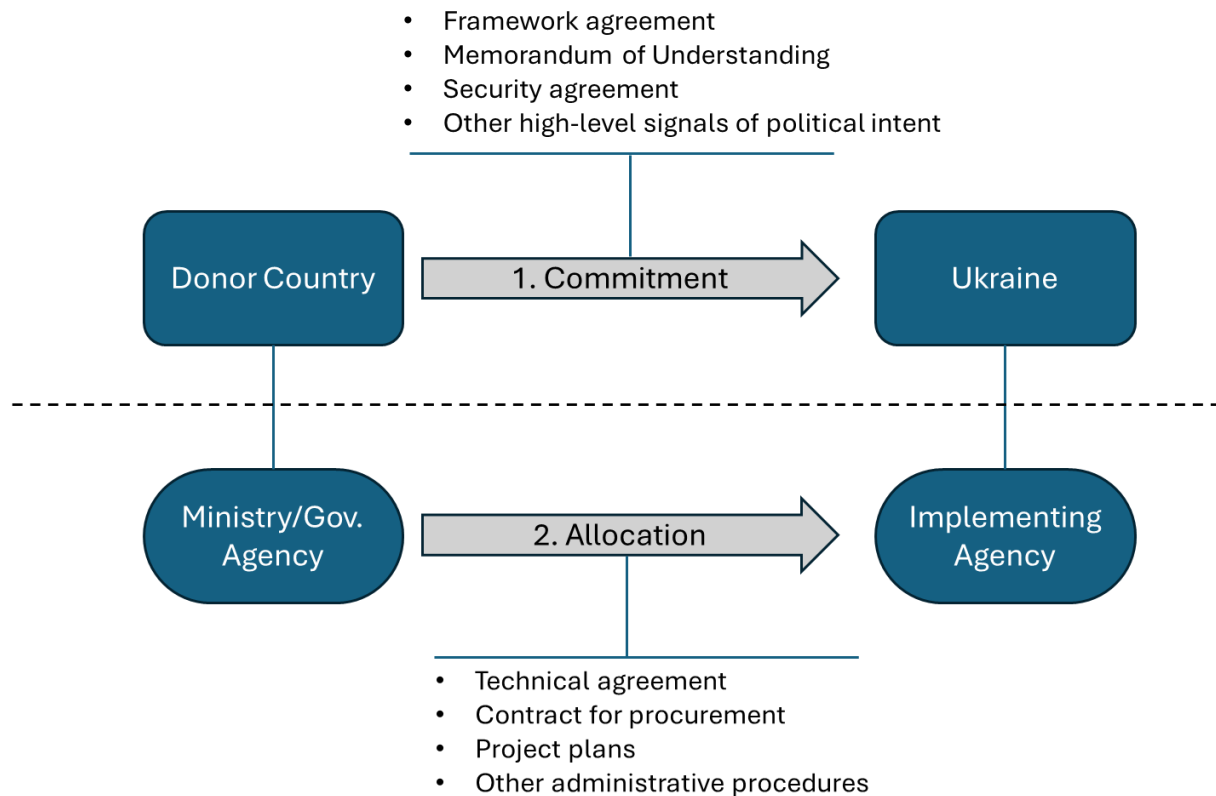
⁴ Some private donations are also channeled through international organizations. For example, UNHCR's Ukraine emergency response received more than \$200 million from companies, foundations, and individuals (UNHCR 2022; reported on March 14).

⁵ The standard definition by the OECD for a commitment is the obligation in writing or backed by funds for an official donor to provide specified assistance to a recipient country or multilateral organization (OECD, 2008).

⁶ [Agreement on Security Cooperation and Long-Term Support between Ukraine and the Kingdom of Norway](#)

⁷ [Agreement on Cooperation and Long-Term Support between Belgium and Ukraine](#)

Figure 1: Representation of Ukraine Support Tracker tracked activities



Our approach distinguishes us from other aid datasets, which typically compile data retrospectively (ex-post) or which focus on specific stages of the aid delivery. The targeted scope of our dataset makes it unsuitable for certain uses. The dataset does not capture the universe of support and should not be compared to other aid datasets. The data should not be interpreted as a measure of the financial burden on donor countries. It does not operate as a project tracker, a project evaluation tool, or as an accountability mechanism for donors. The dataset uses its own methodology, as described in this document, and is best used to make comparisons between and within countries which are part of the Ukraine Support Tracker donor group.

2.2 Source of aid

In this section, we describe the different sources of aid we consider when compiling the data on support to Ukraine. This includes the sample of donor countries as well as the specific institutions, national and international, involved in the aid giving process.

2.2.1 Country sample

We focus on government support from 41 countries, plus the EU institutions. The largest country group are the 27 EU members: Austria, Belgium, Bulgaria, Croatia, Cyprus, Czech Republic, Denmark, Estonia, Finland, France, Germany, Greece, Hungary, Ireland, Italy, Latvia, Lithuania, Luxembourg, Malta, Netherlands, Poland, Portugal, Romania, Slovakia, Slovenia, Spain, and Sweden. In addition, we include member countries of the Group of 7 (G7), meaning that we also code support by Canada, Great Britain, Japan, and the United States. Finally, we include 9 additional countries, namely Norway, Switzerland,

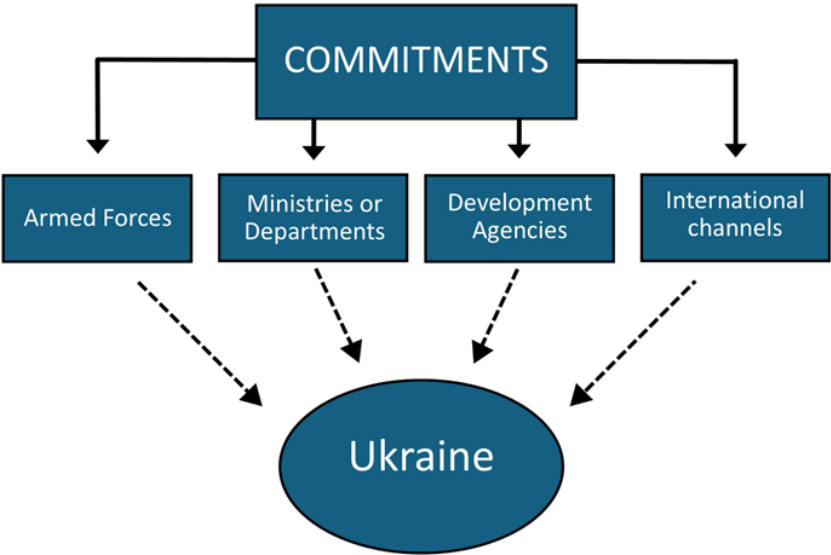
Australia, New Zealand, South Korea, Turkey, Iceland, India, China, and Taiwan. From the EU institutions, we provide data for programs and projects from the European Commission and Council. Within the operations of the European Commission, we also consider the European Investment Bank (EIB), with its mandate as the lending arm of the EU institutions.⁸ These serve as the main coordination mechanisms for EU level aid, mobilizing financing and material assistance from EU funds and member states. Section 2.4.1 explains the computation for EU-aid level statistics.

2.2.2 Aid channels

The official sector aid activities tracked in the data are mobilized through the relevant ministries or national agencies responsible for financial, humanitarian, or military related aid for Ukraine. These entities are responsible for initiating, funding, and managing aid projects directed towards Ukraine. For financial aid, ministries of finance or national treasuries often play a pivotal role, allocating budgetary resources or extending credit guarantees. National development agencies and ministries for foreign affairs are central to the provision of both financial and humanitarian aid, managing grants, loans, and in-kind contributions. These agencies are typically tasked with the implementation of development projects, ranging from infrastructure rebuilding to economic stabilization efforts in Ukraine. Finally, defense ministries, in coordination with international bodies like NATO, are the key actors overseeing military aid packages.⁹

It is through these national agencies and public sector organizations that the donor countries translate commitments into actionable aid, making them the primary channels through which aid flows are directed and recorded in our data. We focus on these to track aid flows to Ukraine. Figure 2 gives a stylized overview of these channels.

Figure 2: Donor country aid channels

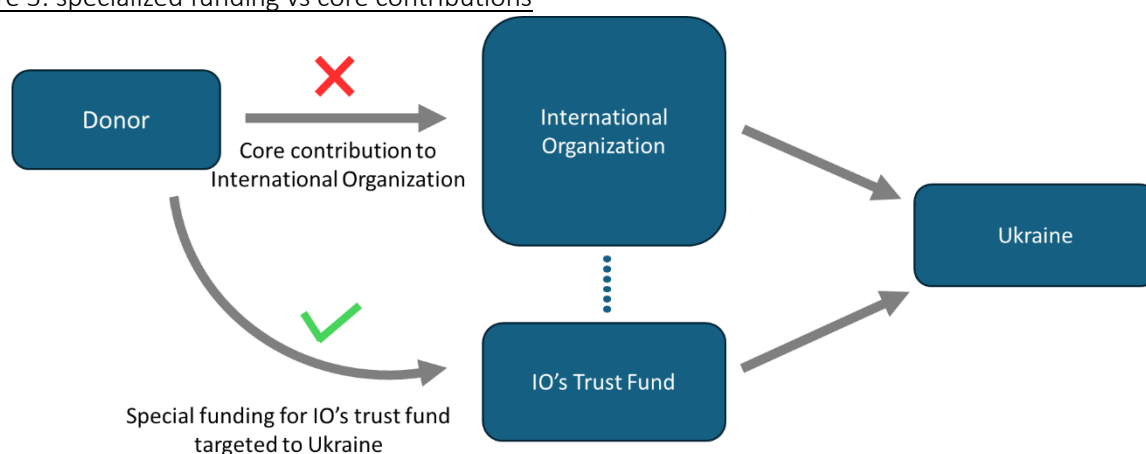


⁸ Information on the [mandate of the European Investment Bank](#).

⁹ Additionally, specialized defense procurement agencies such as the U.S. Defense Security Cooperation Agency facilitate the procurement and delivery of military equipment.

We do not track multilateral support. We instead focus on the mechanisms through which international institutions can serve as conduits for bilateral support. This support that is channeled through multilaterals for a given sectoral, thematic, or individual project, is sometimes classified as “bilateral through multilateral expenditure”, “trust fund contributions”, or “multi-bi aid”. The aid we capture in this context is separate from core funding to multilaterals, as it is both earmarked for specific use (for Ukraine) and financed by voluntary contributions from donors.¹⁰ We track these multilateral channels as they are a pass-through mechanism for donor support to Ukraine, often providing targeted technical support or financial for specific projects. Figure 3 provides a representation of this coding procedure, showing that we only consider flows which are outside the core contributions or funding for a given international organization. Appendix A.1 provides a list of the main multilateral channels used for funneling aid to Ukraine, including the UN, the World Bank, the IMF, and other international funds and initiatives.

Figure 3: specialized funding vs core contributions



2.3 Type of aid

We distinguish between military, humanitarian, and financial aid. Military support includes all types of weapons and military equipment alongside items explicitly donated to the Ukrainian army (such as bottled water, gasoline, or foodstuff), as well as funding for weapon acquisition. Humanitarian aid refers to assistance supporting the civilian population, mainly food, medicines, and other relief items. Financial contributions with a clear humanitarian or military purpose are counted for the respective category and not as financial aid. Financial support includes grants, loans, and loan guarantees made to the government of Ukraine.¹¹

2.3.1 Humanitarian aid

We define as humanitarian any aid activity intended to bring relief or protection to people in Ukraine. These recipients include civilians, internally displaced persons, or in general any non-military component of the population in Ukraine. Our definition of humanitarian aid is broadly consistent with internationally

¹⁰ For a discussion on the proliferation of trust-fund aid see Reinsberg et al. (2015).

¹¹ In certain cases, we also distinguish a fourth “unknown” category which reflects the uncertainty of specific commitments. Given the fluid nature of certain donor financing schemes, some commitments made within the framework of large initiatives or budgetary programming are ambiguous. Thus, when such a commitment is made and we cannot determine a specific type of aid, we assign it to this fourth category until new information comes to light.

recognized standards, and includes the provision of shelter, food, water and sanitation, health services, as well as war-specific priorities like demining and assistance for post-war reconstruction. In turn, this aid falls broadly into two categories; *emergency* and *reconstruction* and can be either in-kind (material and equipment) or financial (grants and loans to finance humanitarian activities). We refer to humanitarian aid also as “civilian”, as it encapsulates not only short-term relief but more general assistance to the population of Ukraine. Table 1 provides an overview of these categories with examples.

Table 1: Classifying humanitarian aid

UST flow Type	Definition	Measurement	Example
Equipment	<ul style="list-style-type: none"> Short-term aid In-kind donations of equipment or relief aid 	<ul style="list-style-type: none"> Value given by the source when available Own estimates of in-kind aid 	<ul style="list-style-type: none"> Medical supplies Food Clothing Demining Sheltering
Contribution	<ul style="list-style-type: none"> Short-term funding for humanitarian programs Funds for humanitarian activities to international organizations, NGOs or directly to the Ukrainian state 	<ul style="list-style-type: none"> Value given by the source when available 	<ul style="list-style-type: none"> Donation to the UNHCR to support internally displaced Ukrainians
Assistance	<ul style="list-style-type: none"> Unspecified funding made available for Ukrainian with a humanitarian purpose 	<ul style="list-style-type: none"> Value given by the source when available 	<ul style="list-style-type: none"> Mobilization of funds to support Ukrainian medical institutions affected by the war
Reconstruction	<ul style="list-style-type: none"> Intended for the reconstruction of immobile, long-term physical infrastructure 	<ul style="list-style-type: none"> Value given by the source when available 	<ul style="list-style-type: none"> Municipal buildings Energy infrastructure Medical facility

Short-term humanitarian aid

Much of the short-term, emergency humanitarian aid, in the form of equipment and funding, was given in the immediate aftermath of Russia's aggression. This typically included equipment such as medical supplies, food items, items of clothing, power generators, temporary bridges and emergency vehicles (such as ambulances and fire engines).¹² These in-kind contributions were given directly to implementing agencies in Ukraine or through donor coordination platforms such as the European Union Civil Protection Mechanism (UCPM). Emergency humanitarian aid was also given in the form of funding for humanitarian activities conducted in Ukraine by national development agencies, international organizations and NGOs. Humanitarian activities include demining efforts, emergency health services, cash assistance programs, improving hygiene and sanitation, sheltering internally displaced people, psychosocial support for civilians and the rehabilitation of former combatants. Countries have supported these multi-dimensional humanitarian activities through funding for projects such as the UNDP 's "Promotion of

¹² As of April 30th, 2024, the most frequent humanitarian items (in unit numbers) included: rations of food (189,536), medicines (15,000 packs), medical supplies and equipment (12,183,024), and an undisclosed number of clothing and personal hygiene items. Other larger items include ambulances (292), fire engines (134), other vehicles (148), and temporary bridges (16 including parts).

human security in Ukraine.”¹³ We also consider donor support for the on-the ground activities of specialized NGOs, such as funding for the demining efforts of the International Committee of the Red Cross (ICRC) in Ukraine.^{14,15} In addition, we capture donor financing of major international initiatives with a specific humanitarian purpose for Ukraine, such as the Ukraine Humanitarian Fund administered by the United Nations Office for the Coordination of Humanitarian Affairs (OCHA). Finally, humanitarian aid that is not attributable to a particular program, fund or agency is labelled as assistance.

Reconstruction aid

In our dataset, we code as reconstruction support intended for the construction of immobile, long-term, physical infrastructure. These typically involve restoring schools and hospitals.¹⁶ Donors have also signed long-term framework agreements allowing Ukrainian ministries and public agencies to attract loans from donor countries for reconstruction projects they will implement.¹⁷ Our data specifically focuses on reconstruction projects because they are closely tied to the context of the Ukraine war, reflecting donor intent and responding to war-induced aid demands from Ukraine. Therefore, despite overlap, these statistics are not representative of donors’ traditional ODA projects.

Finally, this differs from definitions that extend beyond infrastructure and include a broader set of activities. In addition to the reconstruction of buildings, the Rapid Needs Assessments (RNA) from the World Bank includes demining initiatives, psychosocial rehabilitation projects, and public sector modernization as components of Ukraine's reconstruction and recovery needs.¹⁸ Instead, we focus on a narrow set of projects, including the construction of schools, hospitals, centers, building repairs, restoration of the energy grid, and road and railways restoration. Other activities that the RNA includes within reconstruction, such as demining, psychosocial support and temporary bridges, are captured in the UST as emergency relief activities. In the same vein, public sector funding that aims to modernize the Ukrainian state or improve transparency is captured as budget support within the category of financial aid.

Additionally, we record the geographic location of aid for reconstruction projects when it is intended for a particular locality. We capture aid assigned to a particular administrative division (e.g., *hromada*, *raion*, or *oblast*) and for a specific building or facility type (e.g. a school, hospital, gas field or power plant). Section 3.1.3 outlines the geocoding process.

2.3.2 Financial aid

We categorize financial aid as the transfer of resources through loans and grants, or through support like credit guarantees and credit swap lines which enhance financial stability and catalyze external financing. Liquidity measures, like loans and grants, make up most financial aid by volume. Currency swap lines extended to the Ukrainian central bank are counted as they are standing credit lines allowing Ukraine to pay for imports and urgent war necessities in foreign currency. Most of the financial aid we capture in our dataset has as a purpose either general or sector budget support. Furthermore, it is

¹³ [United Nations Development Program \(UNDP\) Promotion of human security in Ukraine through responding to the multidimensional crisis caused by the war.](#)

¹⁴ [The HALO Trust in Ukraine.](#)

¹⁵ [International Committee of the Red Cross \(ICRC\) in Ukraine.](#)

¹⁶ For instance, Belgium has allocated €150 million to its development agency, Enabel, to design and implement reconstruction projects in Ukraine. The EBRD has instead undertaken numerous projects to restore critical energy and transport infrastructure.

¹⁷ For example, South Korea signed a Framework Agreement with Ukraine for government bodies to attract loans from its Economic Development and Cooperation Fund (EDCF).

¹⁸ World Bank (2023). [Ukraine: Macro-Financial Resilience and Economic Recovery.](#)

almost exclusively channeled through the various international financial institutions discussed in Section 3.1.3.

We count loans and grants at their face value, also called the “cash basis” method. This method was the standard for ODA reporting until 2019, where in turn ODA captured most of development finance as reported by major aid donors. Only recently did development statistic standards switch to reporting different financial flows in their grant element.¹⁹ More OECD DAC donors now report both the face value and the grant element of their ODA.²⁰

Our approach ensures simplicity and transparency. Additionally, using face value facilitates high frequency tracking and reporting. For example, the computation of the “grant” element would require details on the loan term that may not be immediately available.²¹ This method provides a more immediate and comprehensive picture of the total financial resources pledged to Ukraine, which is essential for understanding the scale of international support. While this approach differs from ODA practices, it is better suited to the requirements and context of our dataset.

Finally, we only consider guarantees for loans which are meant to catalyze further financial support for Ukraine. The majority of these are guarantees to international financial institutions which are then responsible for extending loans to Ukraine. In the case of the European Union, for which we track loans to Ukraine under the Macro-Financial Assistance programs, we do not consider member states guarantees which back these loans to avoid double counting of the aid activity. Table 2 below shows the different categories of financial aid we capture in our data, and how we aggregate them.

Table 2: Aggregating financial flow types

UST flow type	Definition	Measurement	Example
Grant	<ul style="list-style-type: none"> Financial contribution without repayment expectation 	<ul style="list-style-type: none"> Face value at time of donation 	<ul style="list-style-type: none"> Grant contribution to World Bank trust fund for Ukraine
Guarantee	<ul style="list-style-type: none"> Commitment by a third party to cover risks associated with loan to Ukraine. Provides access to markets on more favorable terms for borrower 	<ul style="list-style-type: none"> Face value of the guaranteed amount 	<ul style="list-style-type: none"> Credit enhancements through ADVANCE Trust Fund
Loan	<ul style="list-style-type: none"> Financial contribution with repayment expectation, made with varying structure 	<ul style="list-style-type: none"> Face value 	<ul style="list-style-type: none"> Bilateral loan from donor to Ukraine

¹⁹ [Development Co-operation Report 2014: Mobilising Resources for Sustainable Development](#). OECD (2014).

²⁰ The OECD DAC guidelines ensure that member countries, including the UK, Germany, and France, report both metrics for standardized international comparison. International financial institutions like the World Bank and the IMF, as well as the European Commission, also provide detailed reports that distinguish between the face value and the grant element of their financial aid. In the case of the United States, USAID typically reports the face value, with detailed reports also considering the grant element for concessional loans.

²¹ The calculation of the grant element in aid statistics was formalized in a [2014 OECD DAC high level](#). The grant element is the “gift portion” of a financial transaction and is computed as the original amount (face value), minus the total discounted repayments, where the discounted repayments are the yearly repayments expected on the transaction, divided by a discount factor. The discount factor is an exogenously determined rate which reflects the borrower specific risk factor. [See the original OECD proposal for more.](#)

	(maturity structure, interest rates, grant period)	<ul style="list-style-type: none"> When possible, include maturity, interest rates, grant period 	<ul style="list-style-type: none"> EU MFA loans
Swap line	<ul style="list-style-type: none"> Bilateral agreement between central banks to exchange currencies 	<ul style="list-style-type: none"> Maximum amount of the credit line available under the swap agreement 	<ul style="list-style-type: none"> Polish \$1 billion swap line to Ukraine

2.3.3 Military aid

We track two broad types of military aid: in-kind (material) assistance and military related financing. In the first category, military aid is provided through the transfer of items. This is limited to the transfer of goods rather than military-related services, such as training initiatives, as they often occur outside of Ukraine.²² Second, we consider all donor funding which has been earmarked for purchase of weapons or items with a military purpose destined for Ukraine. To avoid double counting, we exclude donor financing which has the purpose of replacing previous donations.

Military-related financing, or military-linked financial assistance, refers to funds allocated for activities that provide military goods and services to Ukraine. This includes financing for military procurement, which can take several forms:

1. Direct procurement: Funds are allocated specifically for purchasing military items or services. This procurement may occur within the donor country, such as (Denmark funds procurement of weapons from Danish defense industry for Ukraine), or directly within Ukraine (Canada funds the setup of a sustainable F-16 fighter aircraft capability in Ukraine).²³
2. Partner country procurement: In some instances, procurement is conducted through partner countries or international initiatives. An example of this is the Czech artillery ammunition initiative, International Fund for Ukraine (IFU), NATO CAP, etc.

For direct procurement, our data captures the donor's allocations for specific initiatives. In the case of international initiatives, the funding might be designated for strategic areas such as drones or tanks, or it may be more generic. Furthermore, we only consider the first-stage donations to the funds, not the subsequent aid provided by these funds. In the example of the IFU, we count the donor funding amount but not the value of the weapon outflows.

In-kind military aid varies by type and source. Broadly, we divide military into military equipment (e.g. helmet, body armor, and gas mask) and small-caliber weapons (e.g. rifle, grenade launcher, and machine gun) and heavy weapons (e.g. artillery unit, main battle tank, and air defense system). We follow the classification proposed by the Stockholm International Peace Research Institute (SIPRI) and the UN to distinguish heavy from non-heavy weapons. Section 2.4.2 provides a detailed explanation of measurement practices related to heavy weapons. These items can be sourced from donor national stocks, and in some cases, from private stocks.²⁴

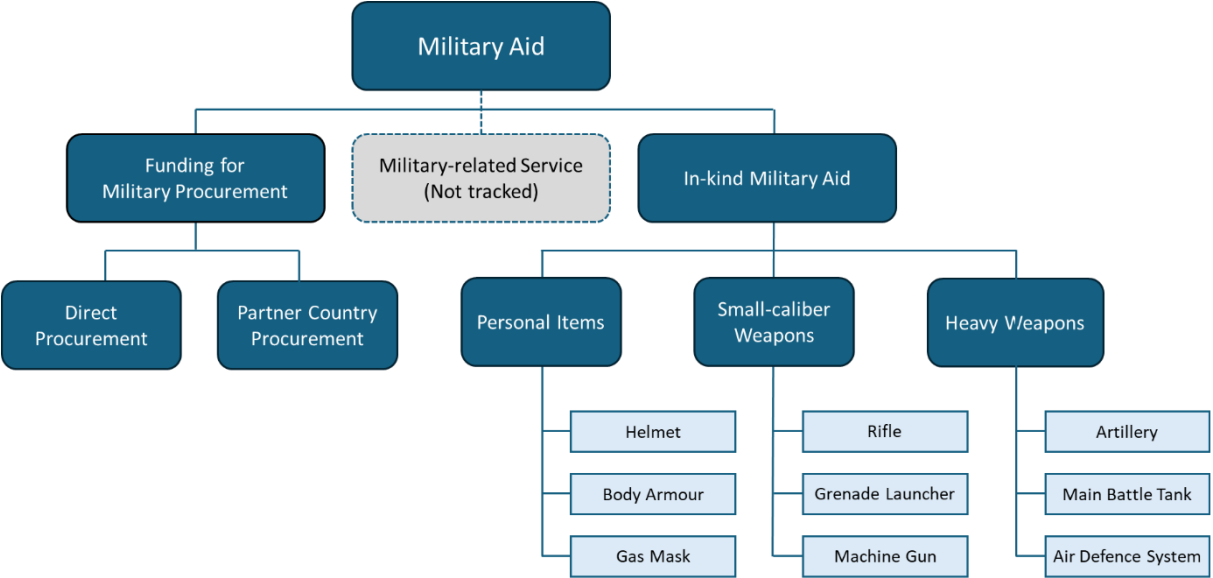
²² Ukraine soldiers trained in Germany: <https://www.bundespraesident.de/SharedDocs/Berichte/EN/Frank-Walter-Steinmeier/2024/240223-Bw-Klietz.html>. The US-led Joint Multinational Training Group-Ukraine is also located in Germany: <https://www.7atc.army.mil/JMTGU/>.

²³ [Canada funds the setup of Air Force Capabilities in Ukraine.](#)

²⁴ Items from private stocks must be purchased or ordered by the governments of the countries in our sample to be accounted in the dataset.

Figure 4 provides a graphical representation of these different military aid categories in our data, as well as the categories which are not in our data.

Figure 4: Classification of military aid



2.4 Measurement

Our data is recorded with the donor-reported, face-value amount of the aid activity. When the aid is a financing scheme or a financial flow, it is often reported in local currency. When it is in-kind, it is often reported with the unit amount, or in some specific cases, alternative measures such as ration or tonnage.²⁵ In this section, we discuss the main measurement challenges and practices adopted in this dataset. This includes conversion practices for harmonization as well as empirical assumptions made for quantifying in-kind aid. As the Ukraine Support Tracker also uses external data for certain statistics, this section also describes these data sources and uses. Finally, it provides further detail on quantifying in-kind military aid.

2.4.1 Accounting practices and economic adjustments

In this subsection, we lay out the main accounting practices used in the dataset. This includes currency and inflation adjustments, the use of additional economic indicators, and other reporting methods used. These practices ensure consistent and meaningful comparisons across different donors and aid types.

2.4.1.1 Constant currency reporting

To provide comparable estimates, our headline figures are converted to constant 2021 Euros, measured in billions. We follow a similar methodology of Custer et al. (2023), which is carried out in two steps. In the first step, we convert the nominal amount of donor reported aid to Euros using the European Central Bank reference spot exchange rate at the time of announcement of the aid activity (ECB, 2024). We use the monthly average of the exchange rate to smooth out excess volatility from exchange rate fluctuations.

²⁵ As an example, France’s third convoy of relief vehicles and supplies delivered to Ukraine in May 2022 contained an undisclosed amount of medical equipment and food rations.

Subsequently, we deflate the amounts to 2021 values. This deflation formula is composed of two parts:

$$\text{Deflator} = (\text{GDP deflator (annual \% change)}) \times \left(\frac{\text{2021 euro exchange rate}}{\text{current year euro exchange rate}} \right)$$

Where we first account for yearly inflation dynamics with the World Bank annual Euro GDP deflator (World Bank, 2024a). The second part is the yearly change in the exchange rate between the original reporting currency of the donation and the Euro, with respect to our baseline year of 2021. This captures changes in the donor's purchasing power relative to exchange rate fluctuations with the euro. The measure is constructed yearly to smooth out excessive fluctuations in the exchange rate and to match frequency of the GDP data.

In the case of military aid, we take an additional step and use a donor country specific GDP deflator. Most military aid consists of the procurement and then delivery of goods whose prices are strongly tied to domestic factors. The most obvious example is that of differences in the characteristic of the defense industry in the donor country, where for example US procurement and construction of weapons will differ significantly from that of a smaller European country with a less developed industry. Accounting for these differences in cost structure is important to correctly value donor military aid.

2.4.1.2 Aid as percent of 2021 GDP

In certain cases, we report aid commitments as a percentage of a country's 2021 GDP, using GDP data from the World Bank (World Bank, 2024b). Reporting aid as a percentage of 2021 (pre-war) GDP provides a standardized measure for cross-country comparisons of commitments. It should be noted that the use of pre-war GDP is also motivated by the need to eliminate general equilibrium effects, where the scaling factor (donor country GDP) could be influenced by macroeconomic shocks from the war. These shocks include fluctuations in commodity prices or significant increases in government procurement in the military sector to address geopolitical risks.

2.4.1.3 Timing of aid

Our data starts on January 24th, 2022 (the day several NATO countries put their troops on alert) and is measured on a daily frequency based on the reporting date of the donor aid announcement. The Ukraine Support Tracker is updated regularly, every 1-2 months, to allow for the data collection process to be carried out in full (see Section 3).

Based on the reported date, the data also distinguishes between short and long-term commitments. Short-term aid is that which is intended for the same fiscal year in which the announcement is made. This aid can encompass both allocations, which is aid under implementation or delivery, as well as short-term commitments. Short-term commitments are commitments which are intended for use within the same fiscal year. Long-term commitments instead encompass promises of aid for any number of fiscal years beyond the one in which the aid announcement was made.

The fiscal year of the donor country thus plays a role in how the temporal dimensions of aid are categorized and reported. For instance, while the fiscal year in the United States runs from October to September, the fiscal year in the United Kingdom runs from April to March. Our methodology accounts for these variations, ensuring that aid is appropriately classified and valued according to the fiscal timing and earmarking practices of each donor.

2.4.1.4 Donor imputed share of EU aid

The relevance of aid coming from the EU institutions is such that focusing on strictly bilateral assistance is limiting. We therefore also provide additional measures which account for this, by reassigning EU-level aid to the individual EU member countries.²⁶ Therefore by “bilateral” we mean government-to-government support, excluding EU-level aid. Whenever we refer to “total” we mean bilateral support plus the share of EU aid attributable back to the donor. This latter type of aid flow is more commonly known as the “donor imputed share of multilateral aid”.

There is no standardized way of calculating this reverse flow.²⁷ We follow the OECD's recommended methodology and focus on computing the (proxied) donor's share of the multilateral's outflows, as this best represents donors' efforts (OECD, 2023b). To do this, we use core contributions of donors to the multilateral organization, in this case the EU institutions. Computations are made in the following manner:

- Aid from the European Commission and Council are assigned based on each member country's relative contribution to the EU budget in 2020 (European Commission, 2021).²⁸
- EIB commitments are assigned using each country's weight in the EIB's capital subscription shares as of 2012 (European Union 2012; Protocol (No. 5), Article 4).

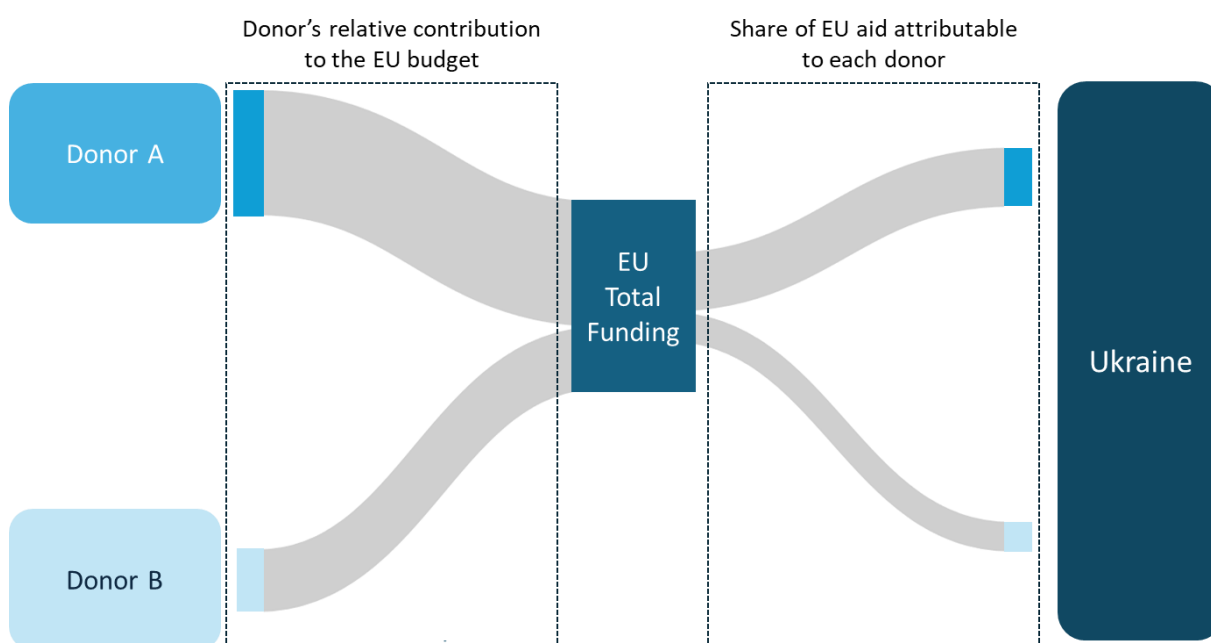
Figure 5 below is a schematic representation of this imputed donor aid share. As the figure shows, the output share of the EU's aid activity to Ukraine is reattributed to the donor proportionally, based on the relative weights explained above. Section 3.1.3 discusses the case of donor contributions through other multilateral funding modalities, such as multi-donor trust funds.

²⁶ In contrast to previous versions of the Ukraine Support Tracker, we no longer consider contributions either from, or to, the European Peace Facility (EPF). The exact workings of this fund remain vague, with the only available information indicating that it serves mostly as a reimbursement mechanism. This reimbursement process remains unclear due to a lack of official information, and we find little evidence of how and when this facility has been used in practice. In particular, the risk of double counting associated with these flows is large. Given that EU countries can reclaim up to the full amount of their contributions to EPF as reimbursement for previously provided military packages, it is highly likely that the value of military support to Ukraine is already captured by these previously committed packages. Until version 15 of the dataset, we counted the financial ceiling of the EPF as a component of EU aid, reassigning the value back to the bilateral level statistics through a calculation like the one explained in this section.

²⁷ As example of country specific idiosyncrasies on this topic, see [methodological discussions in the UK FCDO on imputed multilateral shares](#).

²⁸ Accessed via Internet Archive at [2021 EU spending and revenue](#).

Figure 5: Calculation of donor-imputed share of EU aid



As mentioned before, the donor's share of EU aid captures donor efforts. This approach is not an expenditure-based, "follow the dollar", type of statistic, which is unfeasible for several reasons as outlined in the relevant OECD methodological note (OECD 2023b). First, there are significant delays between the inflow of donor contributions and the disbursement of funds by the EU. Second, while core contributions are theoretically pooled, internal earmarking of funds for specific uses can occur. Finally, the outflows from multilateral organizations each year will significantly exceed any single donor's contribution due to lending reflows, fund transfers, and borrowing on financial markets. Thus, attempting to convert between donor (core) contributions and multilateral outflows would be unrepresentative.

2.4.2 Quantifying in-kind aid

Whenever governments report the total value of a donation activity, we use these numbers as the baseline value. In other words, we take as a first best the total activity value reported by the donor. This generates consistency in our reporting standards across donors. In most cases, the number of specific items is not reported, but only the overall value of the activity. Providing item level estimates, based on prices, would generate distortions in aggregate statistics which are only related to differences in donor reporting standards. These issues are more prevalent with military items. In the following subsection, we discuss the procedures taken when we revert to estimates of in-kind aid.

2.4.2.1 Quantifying heavy weapons: classification, valuation, deliveries and stocks

Donations of major conventional arms or heavy weapons are comparatively important within total aid flows in our data collection, given their frequency and size. However, data quality is typically limited by security concerns surrounding these donations. Furthermore, there exists no standardized methodology for quantifying military transfers or stocks. Reported statistics are typically either based on national accounting standards or on commonly cited databases from which the methodology may vary. This makes quantification of this subset of aid an important empirical question in our data collection. In this

section we lay out the three main components we consider: classification, valuation, deliveries, and stocks.

Classification

We follow the approach set by the UN to define heavy weapons.²⁹ Thus, we consider battle tanks, armored combat vehicles, large-caliber artillery systems (75mm and above), combat aircraft, attack helicopters, warships, and missile launchers (except for MANPADS) as heavy weapons. In addition, we also use the SIPRI Trade Register as a reputable source to compare our classification of certain weapons in the same category. This means that we exclude items such as armored utility trucks, transportation vessels, transport helicopters, etc. from all statistics related to heavy weapons.³⁰

Among heavy weapons, we further distinguish between six major macro-categories: main battle tanks (MBTs), infantry fighting vehicles (IFVs), other armored vehicles (such as armored personnel carriers), howitzers of various calibers, multiple launch rocket systems (MLRS) of various calibers, and anti-aircraft systems (both rocket and gun-based) of various ranges. There are additional macro categories such as mortars and radars, which are typically donated in smaller quantities and therefore do not require additional emphasis.

Within our data, information on these specific weapon designations (i.e., Leopard-2A4) can be either declared by the donor or are derived from complementary sources. There are three specific cases:

1. Specific weapon designation is provided by the donor (Leopard-2A4)

In this first case, there is no ambiguity or need to infer weapon designation. We consider this provided information, thus obtaining the most granular level of weapon designation we can and use this in our main data.

2. Generic weapon designation is provided by the donor (Leopard-2)

In the second case, we turn to several complementary sources such as SIPRI, the United Nations Registry of Conventional Arms (UNROCA), or the International Institute for Strategic Studies (IISS) to try and deduce a more specific designation. As an illustrative example, consider a hypothetical donation by Denmark of an “Leopard-2” tank. Based on stock data of Danish armed forces and previous transfers, we can assign with a high likelihood the weapon designation “Leopard-2A4” to our data entry. If we are not able to do so with sufficient certainty, we assign a generic weapon specification such as “Leopard-2” or “M109 howitzer”.

3. No weapon designation is provided at all (main battle tank)

In this third scenario, we follow a similar approach as described above. Specifically, in these cases we may rely on SIPRI and UNROCA, cross-referencing our tracked donation flows with their information. For example, consider a generic “infantry fighting vehicle” reported as a donation by Germany in 2022. SIPRI or UNROCA record “Marder 1A3” as being transferred from Germany to Ukraine in the same year, and both sources do not report any additional IFV transfers. Therefore, we take the “Marder 1A3” and replace the generic “infantry fighting vehicle”.

However, SIPRI and UNROCA update the data on an annual basis, and UNROCA relies entirely on donor reporting itself, so there are sometimes gaps. We may turn to historical data from the IISS Military

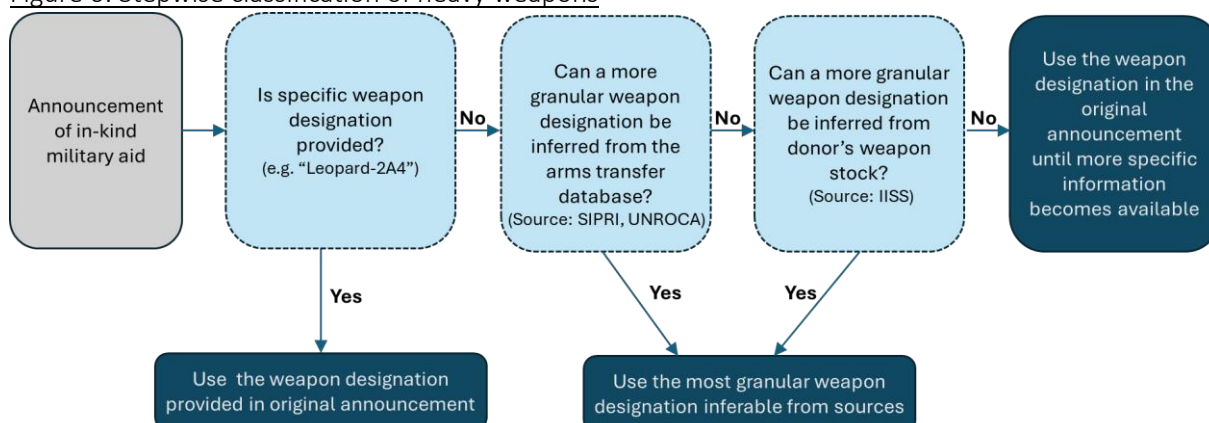
²⁹ [UNROCA heavy weapons categories](#)

³⁰ Note this does not mean we do not count small caliber weapons or other military assistance. See section 2.4.2.2 for the generic framework for quantifying in-kind aid, which includes these smaller military items.

Balance to see donor country stocks of weapons in use within the armed forces, to cross reference with donations which may come from stocks. We also enrich this data with past data on the transfers of the weapon to see if there might be alternative weapons. As an example, consider that Sweden sent unspecified MBTs to Ukraine and declared it was from the stocks. IISS indicates that Sweden has only operated Leopard 2A5s since 2002. Furthermore, SIPRI only records transfers of Leopard-2A5s from Germany in the 1990s when we look for MBTs. Knowing this, we conclude that the only MBT that Sweden can send from its stocks to Ukraine is the Leopard 2A5.

Finally, there are instances when no information is provided at all on the components of military packages. These instances are typically due to national security concerns that are difficult to surmount. In these cases, information will be at times be released publicly with considerable delay, and therefore corrected ex-post in the data. For example, a donor may announce the delivery of an infantry fighting vehicle, and after several months the same donor may confirm the previous delivery of Marders, leading to the update of the previous “generic” classification. In general, there is little evidence that this is a systematic problem. The war is “twitterized”, and information seldom stays hidden for long. Within our data, only Finland maintains a stringent policy of secrecy regarding specific weapon designations in their military aid packages. Figure 6 below summarizes this coding procedure for heavy weapons as outlined in this section.

Figure 6: Stepwise classification of heavy weapons



Valuation

When available, we rely on the information provided by the donor, as described in Section 3.1.4. However, in some cases, donors do not specify the value of the package, but only the exact items provided. In these cases, we approximate the value of the items provided. Our aim is to find reasonable prices for as many items as possible. Throughout, we stick to an “upper bound” rule, to avoid underestimating the true value of support.

Preferably, we use prices from official statements given by the manufacturer, official government procurement reports, or bilateral contracts between governments. If these are unavailable, we rely on current retail prices in the case of military equipment and light armaments. Information regarding military contracts comes from government media sources or the SIPRI Arms Trade database. Retail prices come from online marketplaces and stores.

In case the exact weapon designation or type is known, we search for and use prices for that exact item. When the type of the weapon is not specified, we try to link it to the content of the package. For example, in case the type of ammunition is not specified, we assume that it is linked to the kind of weaponry delivered with the ammunition. When the price of a specific weapon type is not available, we

approximate prices with those of similar weapon systems or models. Similarly, we infer information from the country's military stocks, in case only the weapon category is named, e.g. "anti-armor system" or "anti-armor weapon". Specifically, we assume the donor government to send the kind of item it has in stock or which it regularly uses or purchases. For this purpose, we use information on stocks from the Military Balance Studies (IISS, 2022).

Once the weapon designation or type has been identified and the closest available price has been assigned, we deflate this price to 2021 US dollars using the Bureau of Economic Analysis (BEA)'s Deflator for GDP and National Defense. This allows us to correct for difference in weapon prices over time, particularly for older weapon systems, for which the derived contract prices can go back more than 20 years. The 2021 US dollar value is then converted to Euros and multiplied by the number of items in the package to obtain the package value.

Items with missing prices fall under three main categories. First, no price exists due to a lack of marketability or standardization, such as the cost of refitting or repairing weapons. Second, weapons or other military services that are highly specialized or customized, such as satellite or radar imagery or training. Third, a lack of detail in the sources, e.g. very broad categories such as "tank", "military ammunition", "other military equipment", which cannot be priced convincingly.

Deliveries and stocks

When possible, we provide data on deliveries. Due to the sensitive nature of military logistics, the timing and specifics of these deliveries are often classified. For this reason, the information we can provide on deliveries, based on donor sources, is often delayed with respect to the reporting date. The delivery statistics we therefore provide are time-invariant and are only updated to provide additional information.

We rely on official sources to track deliveries, including official government announcements, press releases from donor and recipient countries, and reputable defense analysis organizations such as SIPRI and IISS. Importantly, we do not utilize open-source methods such as satellite imagery or on-the-ground reports to confirm deliveries. While this type of data collection is important, it is out of the scope of our work, which focuses on official, donor government information.

To scale our aid estimates on heavy weapons with numbers on total donor stocks, we use data from UNROCA. Specifically, these measures are used in figures which compare aid flows of heavy weapons with donor stocks.

2.4.2.2 Non-military in-kind aid

Aside from heavy weapons, there are other instances of in-kind aid supplied. We also estimate the value of these in-kind donations.³¹ We do so by drawing on government sources whenever possible, but also resort to price information available from contracts, online marketplaces and stores when unavoidable.

To estimate the value of everyday items with no fixed prices like "pair of shoes" or "bottled water", we approximate a reasonable value using information from online stores. When possible, we draw on prices and unit costs listed by NGOs. To estimate the value of medical supplies, we use an average of prices listed by NGO sources. For food deliveries, typically measured in tonnage, we follow the literature standard approach of proxying by the value of food wastage, while accounting for luxury and perishable items which would not have been donated (Buzby et al., 2014).

³¹ We continuously improve our estimates and appreciate feedback on individual items to ukrainetracker@ifw-kiel.de.

We typically use the same unit price for identical items across donors. Variation across donors in the unit price of items, such as clothing or medical supplies in humanitarian packages, could reflect country specific characteristics such as the level of industrial capacity or specialization of the donor. Only in the case where the in-kind item is judged to be meaningfully different in scope do we consider the item separately.

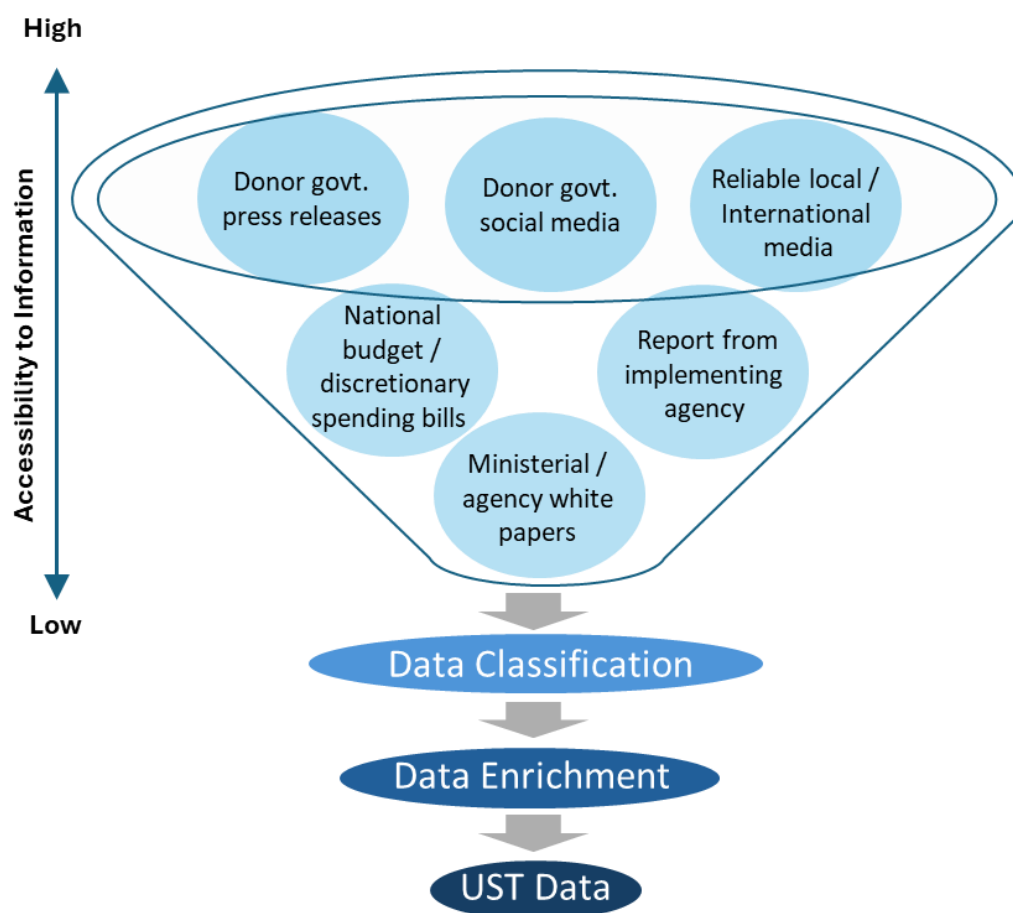
3. Ukraine Support Tracker data collection procedure

We now outline in the data collection procedure. Data collection occurs in three stages. First, the latest available information over the period of interest on support for Ukraine is collected. Then, this information undergoes a set of data enrichment procedures, to provide as much context as possible on the intent, size, and mechanisms for this donor support. Finally, the data is subject to a series of internal and external quality assurance checks. This section will provide detail on each of these steps accordingly.

Figure 7 below first provides a stylized overview of this procedure. Data collection is carried out using several sources, which can be categorized according to their degree of accessibility. Highly accessible sources such as videos of press conferences, donor press releases, social media accounts of ministries or agencies, and reliable international media are typically made public quickly and contain details on the size and main components of the aid activity. On the other hand, specialized reports such as ministerial or agency white papers or financial reports of implementing agencies contain more information on the modalities of specific aid activities but are published infrequently or may remain classified. Therefore, the trade-off for coders is to incorporate the highest degree of detail while meeting the requirements of high-frequency data on support for Ukraine. Section 3.1 discusses the choice of sources for coders in greater detail.

Once all the raw data has been collected, coders will engage in a data-point level quality assurance procedure. This amounts to cross-checking of the new coding with other research staff. Finally, the new data is passed to senior researchers who check for consistency in coding practices and classifications.

Figure 7: Ukraine Support Tracker data pipeline



3.1 Data collection

In this first subsection, we explain how collection of raw data occurs. This “new data identification” is carried out by Ukraine Support Tracker coding staff, which consists of researchers who have been instructed and trained on the methodology.

3.1.1 Raw data collection

Data collection begins with the aggregation of raw data and the identification of potentially new aid activities. To identify a set of new aid activities which could be included in the dataset, coders are instructed to follow three guidelines:

1. Prioritize the donor-side official documentation, communiques, and data repositories which are contained in the relevant country profiles.
2. Use reliable international news media and donor government social media channels to filter relevant information. Whenever possible, trace these secondary sources back to the original donor sources.
3. Consider domain-specific databases (e.g., IMF, WB, ODA databases, IISS Military Balance, OCHA projects), recipient-side data (e.g., Ukrainian government), and partner agency reports as “enrichment” sources. Do not create new entries unless they can be linked back to an official donor statement.

Coders therefore first rely on *country profiles* to start their data collection. Country profiles in the Ukraine Support Tracker are comprehensive catalogs that contain all relevant information needed for collecting

data on aid to Ukraine from specific donor countries. These profiles include sources (such as official donor documentation, communiques, and data repositories), along with detailed explanations of the main implementing agencies and pass-through mechanisms. They also contain country-specific coding practices that the coder must follow. These country profiles are regularly updated by senior research staff and ensure new coders can consistently enter data according to the Ukraine Support Tracker methodology. Figure 8 below gives a stylized example of the kind of information that country profile will contain:

Figure 8: Donor country profiles

<p style="text-align: center;"><u>Donor Country Overview</u></p> <ul style="list-style-type: none"> • Provide a snapshot of donor support to Ukraine, to contextualize specific trends, and provide any donor-specific information. <p style="text-align: center;"><u>Main Donor Data Collection Procedure</u></p> <ul style="list-style-type: none"> • Briefly explain sources and manner of donor support announcement: "The majority of Donor A's military aid is reported by the Ministry of Defense here." • Explain relevant actors (implementing agencies, pass-through mechanisms): "Donor A provides almost all announced financial aid exclusively through WB multi-donor trust funds X, Y, and Z. These can be cross-referenced here and here." • Explain coding practices unique to the donor country: "Donor A has recently introduced multi-year aid programs, which are part of a Ukraine-specific fund rather than the multi-year ODA budget." <p style="text-align: center;"><u>List of Main Sources</u></p> <ul style="list-style-type: none"> • Provide a list of all relevant links which provide primary sources.

Country profiles contain the main sources needed to undertake data collection. Preferred sources include acts of government, such as a decision by ministerial cabinets, an act of parliament, or the signing of an international agreement. Coders also rely on official communications that report an act of government. These include communiques, ministerial press releases and parliamentary inquiries.

For countries where either these sources are not accessible or do not provide relevant information, alternative sources including implementing partner documents, organization reports, official social media channels, or reliable international media are used. Specifically, reliable international news media are defined as those with a large audience (Reuters, Associated Press, etc.), with a smaller audience but specialized focus (online newspapers or journals specializing in defense news), or reports from national news agencies, both in donor countries and in Ukraine.

Coders should prioritize donor government (or equivalent), sources. First, this is relevant for maintaining the original scope of the dataset, which is to capture official donor support for Ukraine. Second, it tackles one of the main methodological challenges, which is the high-risk of double counting due to the "over-reporting" of donor aid activities. The involvement of multiple partners, low transparency, and the rapid emergence of new aid schemes, means that the same aid activity is often reported across various

sources in different forms. Focusing on one source type, with additional sources to integrate and cross-reference, minimizes this risk.

3.1.2 Data classification

Once the relevant sources and candidate entries are identified, coders will classify data according to the main criteria. Specifically, they are instructed to focus on the following dimensions:

1. What is the donor intent: is this bilateral, official sector, support going into Ukraine?
2. What is the flow type: is this a new commitment or standalone project, or is this part of an umbrella project?
3. What is the type of aid: humanitarian, financial, or military?

With point 1, coders are asked to ensure that the newly collected entries fit the scope of the Ukraine Support Tracker dataset. As described in Section 2.2, coders follow the criteria of *bilateral*, *official*, and *direct* support to Ukraine.

Coders first determine if the aid activity is coming from the donor official sector and is bilateral, meaning for Ukraine Support Tracker purposes that it is provided directly by or funded from any donor government public sector entities institutions and it is going inside Ukraine to help people within Ukraine. This commonly excludes things such as training initiatives, typically carried out in donor countries, or refugee assistance for Ukrainians but which is implemented across the border in host countries. Table 3 below contains some generic cases:

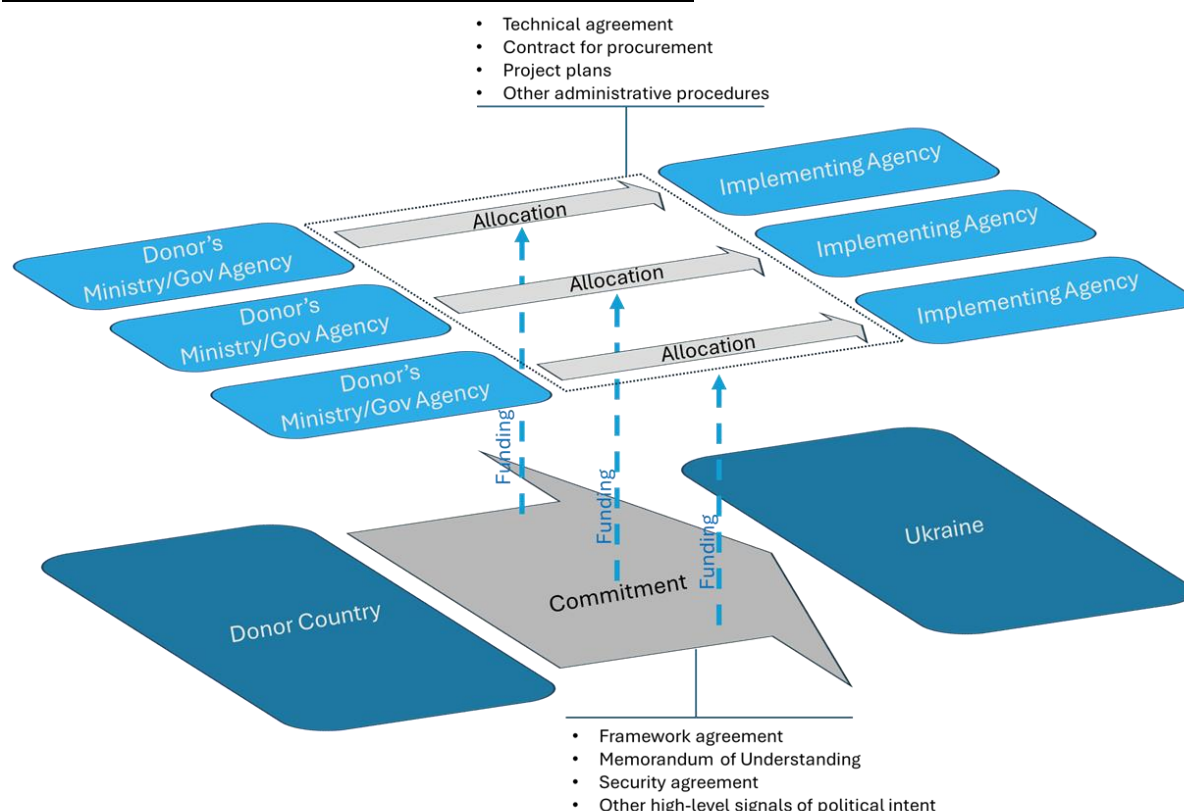
Table 3: Examples of eligible and ineligible aid activities for Ukraine Support Tracker data

	Eligible activity	Ineligible activity
<i>Bilateral</i>	<ul style="list-style-type: none"> Financial aid or budget support In-kind military or humanitarian aid provided directly Funding for Ukraine-specific projects or initiatives which are aimed at delivering a donation to Ukraine 	<ul style="list-style-type: none"> Support to other countries in response to the war Indirect military support or joint training exercises outside Ukraine Multilateral support or core funding to multilaterals
<i>Official</i>	<ul style="list-style-type: none"> Funding from a national government (U.S. Department of Defense) Grants from public agencies (Germany's BMZ-funded projects in Ukraine) Financial aid from a development bank owned by a government (KfW or the European Investment Bank) 	<ul style="list-style-type: none"> Donations from private companies or individuals Charitable contributions from NGOs Crowdfunding efforts or philanthropic efforts
<i>Direct</i>	<ul style="list-style-type: none"> Donor grant to Ukrainian ministry for purchase of good or service Donor country contracting its own firms to build a hospital in Ukraine Earmarked funding for humanitarian aid organizations that directly distribute food and medicine within Ukraine 	<ul style="list-style-type: none"> Donor government export subsidies to its domestic firms Investment guarantee scheme for operating risk of donor country firms Incentives for donor firms in relation to Ukrainian business Refugee support in donor country or partner countries

	<ul style="list-style-type: none"> • Donor-financed military aid, where weapons are procured from domestic firms but sent directly to Ukraine 	
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To answer point 2, coders follow the scheme outlined in Figure 8 below and the definitions provided in Sections 2.1 and 2.2. The figure helps coders sort between different aid categories (commitments and allocations), understand timing (are these allocations part of an umbrella project from previous commitments?), and collect all relevant information on channels or additional granularity.

Figure 8: Structure of Ukraine Support Tracker aid activities



Finally, coders will determine the type of aid from one of the three main categories (financial, military, or humanitarian) as well as the relevant subcategories. Coders should utilize the following additional coding logic when making coding type of aid:

- The type of aid is jointly determined by its purpose and by its source. For example, in-kind military aid is almost exclusively the responsibility of the armed forces or ministries of defense.
- Financing for military related purposes, such as weapon procurement for Ukraine, is coded as such when the funds can be tracked to the eventual delivery of in-kind aid for the Ukrainian Armed Forces. Coders are therefore instructed to exclude funding which is used for reimbursements of previous donations, or which are for partner countries, made in response to the situation in Ukraine.
- Financial aid is intended as budget support or general government external financing. This includes the different instruments outlined in Section 2.3. Different government financing schemes are instead directed for reconstruction or development purposes, which we capture in our broad humanitarian category.

- d. A fourth category is reserved for aid projects where the purpose is not yet clear. These are commitments where the earmarking of funds has not been finalized. Given the rapidly changing nature of aid schemes, these can occur when donor governments set up specialized funds to provide aid for Ukraine down the line. These flows will therefore only enter tables or figures which capture commitments or pledges.

Additionally, coders will insert the *specific type of aid*, or the aid subcategory. Table 4 shows the different categories adopted within each general type of aid classification:

Table 4: Aid categories (type of aid) and subcategories (specific type of aid)

	<i>Type of aid</i>		
	Financial	Humanitarian	Military
<i>Specific type of aid</i>	<ul style="list-style-type: none"> • Grant • Loan • Guarantee • Swap line 	<ul style="list-style-type: none"> • Contribution • Equipment • Reconstruction 	<ul style="list-style-type: none"> • Weapons • Equipment • Funding for Weapon Acquisition Program • Training

For financial aid, these subcategories correspond to the measurement practices outlined in Section 2.3. For humanitarian aid, we distinguish between *contributions*, which is funding to any organization or initiative, national or international, which is operating a humanitarian aimed project for Ukraine. *Equipment* corresponds to all in-kind humanitarian aid, as well as emergency funding for humanitarian items.³² We define *reconstruction* as entries which are specifically tied to an aid activity that can be geocoded. Broad financing for reconstruction, without a specific project, is coded as *assistance* until new information comes to light.

Finally, for military aid, the main subcategories are *weapons*, *equipment*, and *funding for weapon acquisition programs*. The difference between *weapons* and *equipment* is linked to the non-lethality of the latter; we therefore consider all support material or otherwise military-linked in-kind aid which is non-lethal as *equipment*. *Funding for weapon acquisition program* are monetary contributions for things such as joint procurement, or funding for industry contracts. Additionally, there are some minor cases of *training* initiatives.

Across all three main aid types, there are also additional, generalized, categories which are used to identify aid activities. *Assistance* refers to any aid activity for which one of the above subcategories cannot be assigned. *Consolidation* entries are corrections which are inserted into the data but cannot be assigned to a previous aid activity. A common example of this is the ex-post correction of a declared commitment, which cannot be convincingly assigned to a previous entry. These type of *consolidation* entries are more common for countries with low transparency. Finally, *budgetary appropriations* are typically commitment entries, where a pledge has been made but the usage is not yet specific enough.

3.1.3 Data enrichment

In this second step, coders will enrich the data with more detailed, but typically less accessible, documents. Specifically, coders may retroactively update information on previous data entries as new sources of information become available. These include contracts, agency/NGO end-of-year reports, government white papers, agreements between donors and implementing agency, reports and

³² The most common example is the allocation of funds for purchasing generators or winterization aid for Ukraine.

documents from international institutions like IMF/WB. For most cases, the information originally collected from high frequency but less detailed sources (e.g., press releases) correlates strongly with the more detailed information coming after.³³

The goal of this information is twofold. On the one hand, it acts as a cross-checking mechanism for comparing more detailed information with the more easily accessible information such as press releases. For example, the presence of implementing agencies can verify the nature of reported flows and provide further information on financing details or implementation mechanisms and timelines.³⁴ Furthermore, it can provide additional information on previous aid activities.

Coders carry out this data enrichment and verification in three steps:

1. Coders are instructed to incorporate information on implementing partners or international organizations involved.
2. Coders seek to supplement the original data entry with as much detail on the aid activity as possible, such as loan conditions, item quantities and prices, and geospatial information.
3. If at any point these complementary sources indicate the presence of mistakes in previous entries or duplicated data, coders will bring it up with senior researchers who will review it.

Channels and implementing partners

The first step in data enrichment is to search for the channel through which the aid activity is carried out, meaning that partner organizations involved in the implementation should be accounted. Here, coders rely on the country profiles described in Section 3.1.1. To identify partner organizations, coders adopt the following search logic:

1. Establish potential partner organizations based on area of activity
 - a. Military aid will typically be channeled through international coordination mechanisms such as the Ukraine Defense Contact Group (UDCG) or may be involved in swaps between donor countries.^{35,36}
 - b. Financial aid is typically channeled through international financial institutions such as the World Bank or through specific financing mechanisms.
 - c. Humanitarian and development assistance is coordinated both through donor country agencies, national and international civil society groups, and international organizations such as the UN.
2. Coders should conduct a targeted search on the reporting of activities from these partners and implementing organizations.
 - a. Search criteria for specific loan agreements will include keywords such as “*administration agreement Japan world bank multi donor*”. This sample query would return the “Administration Arrangement between the Ministry of Finance of Japan, and the International Bank for Reconstruction and Development and the International Development Association concerning the Multi-Donor Trust Fund for Co-financing of

³³ For example, in September 2022, the Belgian government announced the provision of a military aid package worth 12 €million, which was recorded according to the instructions described above. Later, in January 2023, the Belgian Ministry of Defense published a detailed document disclosing the content of the package and the fact that it had been increased to 25 €million. Based on this information, the entry for September 2022 was updated.

³⁴ Examples include the presence of multilateral trust funds, international organizations, and defense coordination initiatives or weapon swaps. In other cases, international cooperation can be less institutionalized. Particularly at the beginning of the war, much of the support to Ukraine was coordinated and pledged in the context of donor conferences.

³⁵ [More on the Ukraine Defence Contact Group.](#)

³⁶ The German “[ring swaps](#)” were a common mechanism early in the war for providing military aid.

the Public Expenditures for Administrative Capacity Endurance in Ukraine Project (TF073829)".

- b. Coders utilize donor-language search queries to search for relevant documents. For example, *"acord romania ucraina site:.ro filetype:pdf"* provides Romanian-level documents on bilateral security agreements with Ukraine, which stipulate the role of Romania in providing PATRIOT systems.
3. Coders should consult documents which inform on international mechanisms
 - a. The primary mechanisms of interest are outlined in the relevant country profiles and include things such as participation of the donor country in aid coordination mechanisms such as UDCG, the Multi-agency Donor Coordination Platform for Ukraine, or weapon-swap schemes.
 - b. Should the aid activity the coders are reviewing involve some new international partnership or mechanism, they consult with senior Ukraine Support Tracker staff
 - c. Specific documents include, for example, Letters of Offer and Acceptance to Congress or U.S Defense Security Cooperation Agency information on weapon purchases from the U.S through Foreign Military Sales to other donor countries. These are used to cross-check the donor country's weapon transfer network.
 - d. Figure 9 provides an example of potential double counting coders look out for. The transfer of a PATRIOT system from Romania is financed by the U.S Foreign Military Financing program, for which funds were appropriated in the context of the Ukraine aid bills and therefore already accounted for in the data.³⁷
 - e. Coders and senior research staff will then discuss the best way to represent these interconnected aid flows.

Figure 9: U.S FMF as example of donor countries weapon transfer network

16 FUNDS APPROPRIATED TO THE PRESIDENT	
17 FOREIGN MILITARY FINANCING PROGRAM	
18 For an additional amount for "Foreign Military Fi-	
19 nancing Program", \$1,600,000,000, to remain available	
20 until September 30, 2025, for assistance for Ukraine and	
21 countries impacted by the situation in Ukraine and for	
22 related expenses: <i>Provided</i> , That amounts made available	
23 under this heading in this Act and unobligated balances	
24 of amounts made available under this heading in Acts	
25 making appropriations for the Department of State, for-	
<p>at, în <i>Acordul privind cooperarea în domeniul securității între România și Ucraina</i>, printre altele:</p> <p>România va dona Ucrainei un sistem PATRIOT, în conformitate cu decizia Consiliului Suprem de Apărare a Țării din 20 iunie 2024 (para 6 lit. A pct 2);</p> <p>România va facilita tranzitul tuturor echipamentelor necesare pe teritoriul său către Ucraina, cât de rapid posibil (para 6 lit A, pct 3);</p> <p>România se obligă să acorde asistență cuprinzătoare pentru construirea și întreținerea forțelor armate ale Ucrainei care necesită suficiente <u>stocuri (resurse) militare pentru respingerea agresiunilor viitoare și să caute modalități de cooperare și colaborare și să exploreze opțiuni pentru a ajuta Ucraina să acumuleze resurse strategice</u> (para 6 lit b, pct 2);</p> <p>România va furniza în mod activ capacitățile centrului de instruire F-16 (Forțele Armate Române pentru instruirea piloților ucraineni) (para 6 lit C,</p>	
	<p>The Parliament of Romania adopts this law.</p> <p>SOLE ARTICLE</p> <p>Article 1 of Law no. 222/2017 for the achievement of the "Ground-based air defense capability", related to the essential endowment program "High-range surface-to-air missile system (HSAM)", published in the Official Gazette of Romania, Part I, no. 935 of 27 November 2017, as subsequently amended, <i>after paragraph (3)</i> three new paragraphs are inserted, para. (3¹)-(3³), with the following content:</p> <p>(3¹) A PATRIOT surface-to-air missile system, in the configuration presented in the annex*) which is an integral part of this law, is subject to deeds of donation to third parties, under the conditions of the law, by Government decision.</p> <p>*) The annex is not published, being classified, according to the law.</p> <p>(3²) The Government of Romania is empowered to take the necessary steps to reconstitute the ground-based air defense capability, related to the essential endowment program "High Range Surface-to-Air Missile System (HSAM)", by awarding to the Government of the United States of America the Letter of Offer and Acceptance - LOA contracts specific to the Foreign Military Sales Program - FMS for the acquisition of 1 (one) PATRIOT surface-to-air missile system configuration 3+, respectively major equipment, means of transport, materials, parts, maintenance equipment, initial logistic support package and training service, cryptographic equipment and special regime equipment, within the value provided for in para. (2) and from non-reimbursable external funds.</p> <p>(3³) The amounts necessary for the payment of fees and commissions related to the reconstitution of the ground-based air defense capability will be provided from the budget of the Ministry of National</p>

4. Coders should use information on implementing partners to derive a timeline of aid schemes

³⁷ The Romanian parliament passed a law enabling the donation of a Patriot system to Ukraine. The decision was made on the condition that the donation is made "on the condition that our country's negotiations with the Allies, especially with the American strategic partner, will be continued in order to obtain a similar system or equivalent". The replacement will be paid for by other NATO allies, such as Norway, and it is expected that FMF funds will be made available by the United States government to finance the sale. We therefore consider this patriot as a Romanian entry as our methodology seeks to track the direct transfers between the donor government and Ukraine in real time.

- a. First, they should check that the registered activity announcement date is consistent
- b. In the case that there are discrepancies, the coder should prefer the donor country announcement date.
- c. If the implementing partners and schemes which involve the donor imply the delivery of in-kind aid, the coder should check retroactively whether material has been delivered for previous, related, entries.

To reconstruct the timeline of aid, coders may use also historical vintages of the official webpages or knowledge repositories of implementing partners to verify changes in flows that donor countries have allocated through these partners. Figure 10 provides an example, where South Korea's \$10 million contribution to the World Bank's URTF was first announced in July 2023 and can be cross-referenced by comparing changes in the World Bank's overview page archived on different dates.³⁸

Figure 10: Use of historical vintages for cross-referencing data

WB's overview page (Archived in October 2023)		WB's overview page (Archived in December 2023)	
Japan	\$471 million	Norway	\$290 million
Norway	\$290 million	Netherlands	\$160 million
Netherlands	\$160 million	Canada	\$86 million
Canada	\$86 million	Switzerland	\$58 million
Switzerland	\$58 million	Austria	\$21 million
Austria	\$21 million	Sweden	\$14 million
Sweden	\$14 million	Republic of Korea	\$10 million
Iceland	\$6 million	Iceland	\$6 million

Heavy weapons

A central part of the Ukraine Support Tracker is the quantification of in-kind military aid, as introduced in Section 2.4. Ukraine Support Tracker staff maintains a dictionary of well-established heavy weapon designations and associated prices, to be used when the evaluation of this in-kind aid needs to occur.

In cases where new items are donated as part of an aid activity or this dictionary needs to be updated, coders are instructed to integrate information on weapon designations, number, and prices. To do this, they rely on the sources and country profiles described in Section 3.1.1. Senior researchers are heavily involved when this occurs, as estimates of total aid may be sensitive to variations in prices or weapon designations. Below we delineate the broad set of instructions coders follow when inserting new heavy weapons.

1. Coders need to determine which *weapon designation* is provided
 - a. First, the original source should be consulted to determine the exact name of the heavy weapon provided (e.g., "Leopard-2A5").
 - b. If the original source does not provide a specific designation, but instead provides either a generic designation ('Leopard-2') or only a weapon type (main battle tank), coders should use additional sources such as UNROCA, SIPRI, or IISS to cross-reference the

³⁸ See the press release issued by the Korean Ministry of Economy and Finance on July 18, 2023.

- specific weapon designation. In this scenario, coders should consult with senior researchers and be prepared to explain their logic.
- c. If no designation can be assigned, coders use a generic category (“main battle tank”)
 2. Coders should determine the *price of the weapon* provided
 - a. As a first best, if the source provides the price of the items separately for each designation, coders will use this reported price.
 - b. If the price is not provided by the donor, coders are to use additional sources to determine the price.
 - c. First, check government websites where the latest procurements are reported. For example, the procurement contract for a Zusana-2 by the Slovak government in 2018 is a good source for the price of the Zusana-2 howitzer donated to Ukraine.³⁹
 - d. Alternatively, use secondary sources such as the SIPRI Trade Register, which contains information on interstate arms transfers and sometimes includes the price of the contract for each specific weapon. Because SIPRI lists transfers from different time periods and different scenarios, coders should use the average price for the same weapon designation across different transfers. Coders should pay attention to obvious outliers, excluding them if necessary, and to the condition of the transferred weapon (used or not).
 - e. Coders may also search for prices of designations which are reasonable alternatives.
 - f. Coders together with senior researchers should determine which price reflects the weapon donated best. For example, if a used Leopard 2A4 is donated to Ukraine, the price of the used Leopard 2A4 from SIPRI reflects it better than any other source. At this stage, it is especially important to gather additional sources to cross-check if the used price from the intrastate transfer is justified. For example, if the price of used Leopard-2A4 for a particular contract in SIPRI is similar to the price of a new tank from the national procurement document, this case should not be used or should be excluded from the average price as an outlier.
 - g. Finally, coders are to deflate the price using the National Defense Deflator from BEA and record the item price in 2021 US dollars before converting to Euros.
 3. With the given price and the number of items in an entry, coders will compute the estimated package value based on our prices and number of items by multiplying the two. This estimate is recorded whenever information on weapon designation and prices allows it. However, the final recorded value for the entry will be the donor reported value, unless this is not provided. Section 3.1.4 explains in detail.
 4. In the final stage, coders add the price of the weapon to the specific price list of the dataset, with all the details of why the item was valued in a specific manner, as well as providing the source, thus updating the weapon dictionary.

Financial transfers and conditions

Where possible, coders also integrate data entries that regard financial assistance, both for financial aid such as budget support but also lending for other purposes such as humanitarian or military. The aim is to provide as much information on the borrowing conditions for these transactions, such as interest rates, maturity structure, grant periods, and composition. Original documents containing the legal text and conditions for financial transaction are often difficult to obtain in real time. This is especially true for directly bilateral flows (donor government direct financial assistance to Ukraine). Coders derive this information from primarily three sources:

³⁹ Examples include procurement by [Slovakia](#) or [Germany](#).

1. Original loan documents or contracts
 - a. Coders should first look for donor government press releases from relevant ministries or agencies, which often contain the needed information.⁴⁰
 - b. In the case of loans or financial arrangements extended through international organizations, transparency and reporting requirements typically result in the publishing of loan agreements. Coders are instructed to utilize a query such as *“ukraine mfa loan agreement filetype:pdf”* to search for loan agreements, memorandums of understanding, or similar documents.⁴¹
 - c. Coders should consult data from the ministries of finance or the relevant donor agencies, which may contain loan documents or overviews of lending.⁴²
2. Multilateral institutions and partner organizations
 - a. In the case of the European Commission, the legal text of the regulations guiding the financial transactions contains information such as the disbursement schedule, average maturity, and grant periods. An example is the regulation 2024/729 for establishing the Ukraine Facility and the annex to the Council implementing decision for the Ukraine Plan, which is linked to the facility.⁴³
 - b. We do not report the conditions on World Bank (IBRD and IDA) loans to Ukraine, even though they are catalyzed by donor guarantees or contributions. Coders will list in one of the entry source columns the lending arrangements which contain this information, when it is related to donor support.⁴⁴
3. Expert information (legal counsel, specialized media)
 - a. Details on conditions for the financial transactions can also be found from industry sources, such as advisory services on the loans or other financial partners.⁴⁵

Loan conditions typically vary between fixed-rate agreements, where the interest rate remains constant, and variable-rate structures, where the rate is linked to a benchmark like EURIBOR, with an additional spread applied. In the case of fixed-rate agreements, we consider given rate. In the case of variable-rate agreements, coders will record the spread as the interest rate and indicate in the explanation columns the benchmark rate which varies over time (EURIBOR, SOFR, SONIA, or TONA for example).^{46,47}

When figures or calculations need to be made that present borrowing costs for Ukraine at a specific point in time and are determined by variable rates, we utilize aggregates of the variable rates mentioned above to compute our statistics.

Geospatial data

For civilian aid, and in particular reconstruction initiatives, we also provide information on the spatial dimension of projects. Coders are instructed to compile geospatial information on projects in the following manner:

⁴⁰ For example, the [Japanese bilateral loans to Ukraine in 2022](#).

⁴¹ The Ukrainian Ministry of Finance typically hosts these documents. For example, the [2022 exceptional MFA](#).

⁴² For example, most western donors maintain a repository of concessional lending made ([see Italy as example](#)).

⁴³ The regulation can be found [here](#) with information on Ukraine Plan loans and the disbursement schedule in the implementing decision [here](#).

⁴⁴ For example, the [loan agreement under the sixth additional financing for PEACE](#) backed by donor guarantees.

⁴⁵ See as example the [CAD 2.4 billion loan to Ukraine](#).

⁴⁶ We adopt the notion of spreads as defined by the World Bank [here](#).

⁴⁷ Our sources for [EURIBOR](#), [SOFR](#), [SONIA](#), and [TONA](#) benchmarks.

1. Determine the set of geocodable activities, which must be with a reconstruction purpose and a clear geographical scope intended by the donor country. This ensures the existence of earmarked funding for the project and a program for implementation. Finance for umbrella projects to international organizations which pool funding or implement reconstruction projects are not geocoded, as the implementing organization will be responsible for providing this information.
2. Record the coordinates of a point that best approximates the location of a declared project, using points over vectors and polygons, as reconstruction projects are mostly intended for buildings, facilities, or a particular administrative division of Ukraine which are best represented as a point on a plane. For example, construction of a hospital in Lviv, instead of a road connecting two points.
3. Represent the accuracy of this location on a scale of 1 to 3, from the least to most accurate (1: *Oblast*, 2: *Raion*, 3: *Hromada*). To prevent disclosing possibly sensitive information on ongoing reconstruction projects, coordinates for buildings or facilities are assigned to their nearest city or town or to a centroid coordinate of the project, without providing coordinate level data of the building or facility.
4. When possible, we also record the type of *Building or Facility* that each allocation of reconstruction aid intends to support (e.g. *a hospital, school, gas field, or power plant*).
5. Whenever there are multiple project locations, and the value cannot be redistributed between them, it is split evenly between the intended locations. Locations with the same coordinates are distributed on a circular area centered on their shared coordinates.

We do not monitor the implementation of reconstruction projects in Ukraine. The Territories and Infrastructure Development of Ukraine does so in the Digital Restoration Ecosystem for Accountable Management (DREAM) platform.⁴⁸ This initiative gives frequent updates on the stages of ongoing reconstruction projects to monitor the efficiency and effectiveness of project delivery. Instead, we record aid committed and allocated for reconstruction projects on specific locations from the donor side, and not the subsequent implementation stages.

3.1.4 Data aggregation

Once data collection and integration are completed, coders fill out the various indicator variables which are used to sum entry-level data to donor and year aggregates. The first step is to assign a monetary value to the individual entry. To assign this monetary value, coders and senior researchers use the following criteria:

1. If the total value of the entire activity is provided by the donor, this value is used in its original reporting currency.
2. If no total value is provided, but type and number of items are at least partially available, the procedure described both in Sections 2.4.2 and then 3.1.3 is undertaken to estimate a value.
3. If no package value or item types or numbers are provided, the entry is anyways recorded for future integration when data becomes available but will substantially be a “dead” entry and will not impact aggregated statistics.

Once the entry level computations have been made, aggregated estimates are compiled by summing up across categories (by donor, aid type, month, etc.). The crucial point in this aggregation is for coders to

⁴⁸ The Ministry for Communities, Territories and Infrastructure Development of Ukraine does so in the [Digital Restoration Ecosystem for Accountable Management \(DREAM\)](#) platform.

distinguish between independent and nested entries in the dataset, such as allocations which are part of a large commitment scheme. Section 4.1 below illustrates the dataset structure in more detail and explains when coders should consider allocations as part of a broader “umbrella” project, and when they should be recorded as independent activities.

Remaining adjustments to data are carried out automatically through a series of formulas in the main dataset, which for example generate constant currency values of the recorded aid entries by the coder.

3.2 Data quality

The final step in our dataset preparation regards quality checks, both at the entry level and at the dataset level. The former is carried out during data collection, in the final preparation for publication. The latter consists of a series of periodically carried out “benchmarking”. This is done whenever substantial new information on previous donor activities is revealed. The most common example includes de-classified information by donors, or when previous aid activities are systematically centralized by the reporting party. The following subsections detail all issues related to data corrections and quality checks.

3.2.1 Entry-level data quality

Following raw data collection and data integration, coders are instructed to double-check each other’s entries. Each country assigned to a coder is also assigned to at least one other coder, who will carry out a quality control of both the information collected and how it has been inserted in the dataset. This ensures that all new entries are reviewed by at least two coders. Double checking is carried out in the following manner:

1. Consult the country profile of the donor country.
2. Check that the most relevant dimensions of the donor have been taken into consideration by the original coder, such as presence of multi-year programs or specific international channels
3. Perform a naïve data search to check for missed information.
4. Check that all entries by the original coder have been correctly inserted, including reported value, number of units, currency of reporting, and dates associated to each activity.

At any point during the double-checking phase, questions or feedback on the entry will be directed to the original coder. In the case that a discrepancy persists, or if something is flagged as particularly sensitive, a senior researcher will intervene.

Throughout this process of data assurance, senior researchers engage in periodic reviews of coding practices. The role of the senior research staff in this quality check is to impose consistency in data entries over time, given that junior coders in charge of countries change. To do this, the senior researchers specifically request feedback from the coders on the following elements:

- That the quality of sources reflects the best available information.
- That the entry coding reflects the appropriate intent of the donor.
- That core quantitative characteristics (size, number of items, etc.) are consistent.
- That all relevant partner countries or institutions are correctly identified and accounted for.
- That coding is consistent with domain-specific knowledge of the senior research staff.

Additionally, senior staff carry out independent evaluations of major new entries. These aid flows which are either larger than normal for a donor country, or which are part of new donation schemes. This

ensures that new patterns are quickly homogenized with Ukraine Support Tracker data collection practices.

Finally, each data point is classified according to a “quality of entry” scale. This is a numerical value which ranges between 1 and 5 and indicates how complete the entry is. The index is built on five different components measured on a binary scale (1 indicating “Yes”, 0 indicating “No”) which measure if; a) the foundational information on the measured activity comes from official donor government documents, b) the entry contains quantitative information on the aid activity, such as number of items or loan conditions, c) there is a clear implementation or delivery timeline, d) the aid activity can be cross-referenced with official documentation from intermediary or partner/implementing organizations, and e) the funding source or mechanism from the donor side is clear. The coding instructions for the index are laid out in Table 5:

Table 5: Quality of entry index

Component of index	Value
a) Foundational project information is based on official donor government docs.	Yes (1), No (0)
b) Contains quantitative information (number of items, loan conditions, location).	Yes (1), No (0)
c) Is supported by implementing/intermediary/partner organization docs.	Yes (1), No (0)
d) There is a clear implementation/delivery timeline.	Yes (1), No (0)
e) The funding mechanism is clear.	Yes (1), No (0)
Total	

The total score indicates an overall level of satisfaction with the entry. The index should not be taken as an instrument to define a threshold above which the data is suitable for analysis. All data points inserted into the Ukraine Support Tracker have already been deemed fit for publication according to our practices and standards. Rather, the purpose of the quality of entry index is to direct coders to data points which require future enrichment, as data availability improves with time.

3.2.2 Dataset benchmarking

The need to confirm the quality of the data is justified by this significant heterogeneity in the underlying quality of donor source data. To check the quality and reliability of our data collection, we regularly conduct a series of benchmarking exercises, where we compare our own estimates against newly released information of large countries or country groups. Figure 11 shows an example of these benchmarking exercises. The full set of these can be found in the published working paper or research briefs.

Figure 11: Example of dataset benchmarking

<p><u><i>July 2023 – UK Secretary of State for Defence provides updates on military support for Ukraine</i></u></p> <p>On July 20th, 2023, the Secretary of State for Defence of the UK provided the House of commons with an update on the military support for Ukraine. The report contains both estimates of the total value of military support as well as a detailed list of in-kind military assistance. Compared with our tracked amounts, we find that the amounts for the fiscal year 2022/2023 match, with the report estimating a total of £2.3 billion (€2.6 billion) while we track a total of €2.8 billion. Net exchange rate fluctuations</p>

and minor discrepancies, the amounts are very close. Importantly, of the heavy weapons declared in the report, we miss none. We track all 100 anti-air and 100 anti-tank items committed as of July 2023, as well as all 120 artillery pieces and 14 main battle tanks.

3.2.3 Donor transparency

A main challenge in our data collection efforts is donor transparency. We do our best to list and quantify all publicly declared support, but not all support becomes public. Oftentimes, an activity is only reported with significant lag with respect to its actual implementation date.

Through our entry-level quality checks and dataset benchmarking procedures, we are able to quantify these informational gaps through two transparency indices. These indices (one for overall information quality, and one specific to heavy weapons deliveries) are constructed as follows:

Data transparency index: based on five subindices, the first two being discrete (0-1) and the remaining three being continuous (share of items with detailed information):

1. Designated website (yes=1/no=0): is there an official website on government aid to Ukraine?
2. Total value of commitments given (yes=1/no=0): is the total sum of Ukraine support provided by the government?
3. Government information on individual items (share): share of committed individual items in our database for which we have an official source from the donor (shares from 0 to 1 computed for each country).
4. Monetary value of individual items given (share): share of committed individual items in our database for which we have a monetary value (shares from 0 to 1 computed for each country).
5. Exact number of weapons/military items disclosed (share): share of weapons and other in-kind military items committed for which we have the exact number of items (shares from 0 to 1 computed for each country).

Delivery transparency index: based on three subindices, the first being discrete (0-1) and the remaining two being continuous (share of items with detailed information):

1. Centralized website (1=yes, 0=no): is there an official website where heavy weapon deliveries are available?
2. Official delivery sources (share): share of heavy weapon delivery sources in our database for which we have an official delivery source (shares computed for each country).
3. Delivery sources (share): share of heavy weapon entries in our database for which we have any kind of delivery source (shares computed for each country).

The final score is computed as the sum of the sub-indices. We regularly update and report this information in our dataset.

4. Using the dataset

This final section provides a walkthrough on best practices when using the Ukraine Support Tracker dataset. It relates to the dataset structure and variable naming. All Ukraine Support Tracker primary data, generated based on the process described in Section 3, is maintained in a central data table. From this,

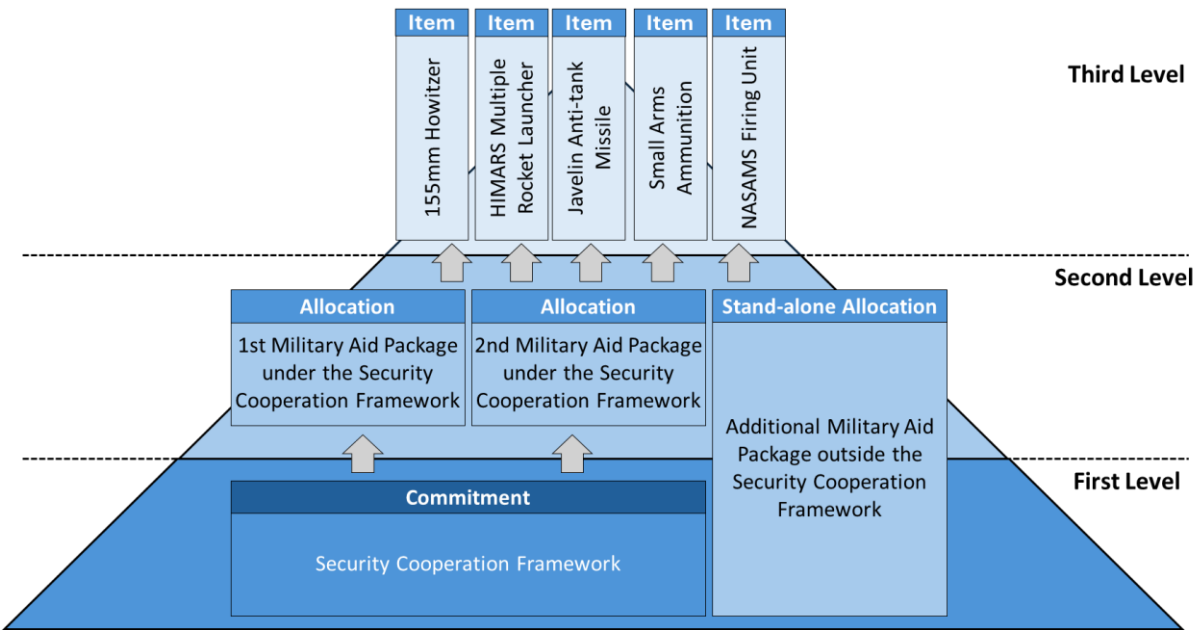
all related Ukraine Support Tracker statistics are generated. The explanations in this section relate to this core Ukraine Support Tracker data table.

4.1 Dataset structure

The Ukraine Support Tracker data is a nested dataset. The dataset is organized into three levels: commitments (and stand-alone allocations), allocations which are sub-activities, and items. The level of reporting provides a hierarchical representation of aid activities, where some aid can be treated as individual events and others are nested into a parent-child structure. Specifically, each level contains the following information:

- 1. First level. Includes both commitments and stand-alone allocations.
 - a. Includes commitments which are parent to a series of allocations which draw from the funding or framework of the commitment. These entries only have an 'Activity ID' ('DEM1').
 - b. Also includes stand-alone allocations. These are aid activities reported by donors which already has a specific purpose and are to be implemented in the foreseeable future. Such entries will therefore have both an 'Activity ID' and a 'Sub-Activity ID' aid of the form 'DEM1' and 'DEM1_1', respectively.
- 2. Second level. Over time, as new information becomes available, commitment entries will be linked to sub-activities that represent the allocation of the committed funds and have a unique 'Sub-Activity ID' ('DEM1_1', 'DEM1_2', etc.). For example, when United States sends military packages using appropriated funds (commitment), each package will be a separate allocation.
- 3. Third level. Within a single aid activity or sub-activity, there may be additional items. This is often the case with military aid. Thus, all items reported in a military aid entry or package will have the same 'Sub-Activity ID'. For example, if the United States sends another military aid package, all items included in the package will be reported "under" that package ID.

Figure 12: Dataset structure



The structure of the dataset has implications for the way that aggregate statistics should be compiled from the entry-level data points. A simple summing up of all values will result in double counting, since

the parent entry of several sub-activities which may exist below it already includes the full committed value. As the variable codebook illustrates, the total values for activities and sub-activities are reported separately, and the aggregation of activity-level data should be done in combination with the *total_value_dummy* dataset variable to avoid double counting. We therefore strongly recommend that users of the dataset rely on the pre-compiled aggregates which are made available.

4.2 Updates and corrections

The Ukraine Support Tracker is a “live” dataset. Donor reporting practices and quality of information generally improve over time, and new schemes for funding and delivering aid to Ukraine replace older ones. When new information is revealed regarding previous aid activity, it can be integrated into the latest release of the data. Typically, this involves adding information on previously undisclosed quantities, amounts, type, or channels of aid. It can, however, also involve correcting wrongly coded previous entries. All significant updates and corrections are recorded in the “Updates and Corrections” sheet of the main data file.

For these reasons, one should not compare versions of the dataset over time. Each new data release is self-contained and replaces previous versions. Methodological changes which affect the reporting of data are outlined in the dataset documentation files.

4.3 Variable codebook

The following Table XYZ describes the variables included in the main data table. All Ukraine Support Tracker figures and tables are compiled from this data table.⁴⁹

Table 6: Ukraine Support Tracker variable description

Variable	Description
activity_id	Unique identifier for each aid package.
sub_activity_id	Unique identifier for each allocation entry within the broader aid package.
donor	Name of the donor country providing the aid.
announcement_date	Date when the aid was officially announced.
aid_type_general	Broad category of aid provided.
aid_type_specific	Specific type of aid within the general category.
explanation	Detailed description of the aid, including timing, purpose and allocation details.
reporting_currency	Original reporting currency.

⁴⁹ The main dataset additionally contains a series of internal variables (separated from the main variables by a *Working/Debug* identifier) which serve the purpose of maintaining dataset integrity through automatic cross checking and are intended for internal use.

measure	Type of aid measurement (commitment, allocation).
source_reported_value	Monetary value of the aid as reported by the original source, in the original currency.
tot_activity_value	Total nominal value, in original reported currency, of the entire aid package ID.
tot_activity_value_EUR	Total nominal value of the aid converted to Euros of the entire aid package ID.
tot_activity_value_constant_currency	Total value of the aid in constant 2021 Euros of the entire aid package ID.
tot_sub_activity_value	Total nominal value of the aid allocated for specific purposes or projects.
tot_sub_activity_value_EUR	Total value of the aid allocated for specific purposes or projects converted to Euros.
tot_activity_value_constant_currency	Total value of the aid allocated for specific purposes or projects in constant 2021 Euros.
tot_sub_activity_value_constant_currency_redistr	Allocated value in constant 2021 Euros after redistribution or adjustments for missing values.
tot_value_deliv_EUR	Total monetary value of the delivered aid in Euros.
item	Type of items provided if the aid is in-kind (e.g., ton of coal).
item_type	Category of the item provided (e.g., Humanitarian, Military).
item_sub_type	Sub-category or specific type of item provided within the broader category.
item_soviet_origin	Indicates if the item of military aid is of Soviet origin (1 = Yes, 0 = No).
item_numb	Number of units in donation for in-kind aid.
item_numb_deliv	Number of units delivered for in-kind military aid (if applicable).
item_price_USD	Price per unit in US dollars for in-kind aid (if applicable).
item_value_estimate_USD	Estimated value of the in-kind aid in US dollars, based on own calculations.
item_value_estimate_deliv_USD	Estimated value of the delivered in-kind aid in US dollars, based on own calculations.
official_source_dummy	Dummy if at least one of the source links is from an official source of the donor government.
source_of_aid_{ }	Source of aid { } with link to original sources. { } = 1,2,3,4
deliv_official_source_dummy	Dummy if the source links for deliveries is from an official source.
deliv_source	Source of aid for deliveries.

channel	Aid channel for implementation or partners involved.
location	Geographic location associated with the aid.
coords	Geographic coordinates associated with the aid.
geo_sources	Additional sources of geographic information related to the aid.
geo_accuracy	Value from 1 to 3, with 1 least accurate (Oblast) and 3 most accurate (town or city).
building_or_facility	Type of building or facilities involved in reconstruction activity.
reconstruction_sector	Sector of reconstruction initiative (energy, infrastructure, etc.)
loan_mat	Reported maturity of loan.
loan_int	Reported fixed component or spread component of loan. Explanation column will indicate the variable benchmark rate to which the spread is pegged, if it is a variable rate loan.
loan_gra	Reported grace period of loan.
updated_dummy	Dummy if entry is newly added or updated.
total_value_dummy	Dummy if the entry corresponds to the first level. Aggregations of the data (i.e., total allocations, total commitments, or aggregations by groups) should only consider those rows which are marked by total_value_dummy==1 to avoid double counting.
month	Month of package since start of war (January 2022=1)
short_term	Dummy if aid is short-term (earmarked for same fiscal year).
earmarked_year	Year for which the aid is earmarked or allocated.
activity_match_deliv	Dummy if deliveries match reported allocation or commitment values.
value_source_activity_type	Value of activity is derived from donor sources or estimated.
value_source_deliv_type	Value of deliveries is derived from donor sources or estimated.
alloc_no_date	Dummy if the allocation entry contains no date.
reallocation_sub_activity_id	ID of sub-activity used to account for missing values.

Appendix

A.1 International channels

In this appendix, we provide a full list of the main multi-bi/delegated cooperation aid flows we track in the context of support for Ukraine. We include a brief explanation of the operations of each, and the main projects financed by donors through these mechanisms.

World Bank

World Bank assistance to Ukraine operates under the Multi-Donor Resources for Institutions and Infrastructure (MRII) for Ukraine Facility. We track loans, grants, or guarantees channeled through one of the MDTFs or initiatives under this umbrella. The largest of these is the Public Expenditures for Administrative Capacity Endurance (PEACE) project provides support for public sector expenditures, including pensions, financial support for internally displaced persons, wages for the education sector, and emergency services.⁵⁰ PEACE has mobilized mostly bilateral grant financing for targeted budget support in the areas mentioned, as well as bilateral guarantees for Investment Project Financing (IPF).

Financing of Recovery from Economic Emergency (FREE) was an instrument for providing co-financing for the Ukraine Second Economic Recovery Development Policy Program. The program was active before January 24th, 2022, and provided financing for Ukraine against the backdrop of the Covid-19 pandemic. The aims of the program are to foster de-monopolization, anticorruption, strengthen land and credit markets, & bolster the social safety net. As a financing mechanism for Ukraine, it is composed of a multi-donor trust fund for channeling donor contributions as well as supporting loan guarantees made through the IBRD.

The most recent initiative is the World Bank Ukraine Relief, Recovery, Reconstruction and Reform Trust Fund (URTF), set up in 2022 with an initial contribution from Switzerland worth approximately €55 million. URTF handles under its framework projects that deal with Ukrainian needs in the fields of transport networks, energy services, health, agriculture, and housing.⁵¹

The Advancing Needed Credit Enhancement for Ukraine Trust Fund (ADVANCE) is a guarantee-scheme backed by promissory notes, mostly from Japan, which works to catalyze a number of specific World Bank projects and loans, including projects falling under the framework of the above-mentioned trust funds.

Several smaller initiatives coordinated by the World Bank were also set up to channel donor contributions towards specific areas. The World Bank Multilateral Investment Guarantee Agency Support for Ukraine's Reconstruction and Economy (MIGA SURE) trust fund provides operating insurance and risk mitigation for business in Ukraine, during and after the war. These include trade finance guarantees for Ukraine to import vital goods and equipment for infrastructure repairs, agricultural production, health service delivery, and preparation for winter as well as political risk insurance for international banks to facilitate access to finance, and liquidity support to Ukrainian businesses. The International Finance Corporation (IFC) of the World Bank also launched a \$2 billion project for financing to the Ukrainian private sector, of which \$1 billion should be sourced from bilateral contributions, but traceability is low, both from the institutions side as well as from the donor side.

International Monetary Fund

⁵⁰ WB [PEACE overview page](#).

⁵¹ See the WB [URTF overview page](#) for details on each project.

The International Monetary Fund (IMF) has provided assistance and coordination in a similar way to the World Bank. On March 9, 2022, the IMF announced an emergency assistance loan of \$1.4 billion to Ukraine under its Rapid Financing Instrument. The purpose is “to help meet urgent financing needs including to mitigate the economic impact of the war”.⁵² An additional \$1.3 billion was approved on October 7, 2022.⁵³ On March 31, 2023, a 48-month Extended Fund Facility (EFF) arrangement worth \$15.6 billion was approved.⁵⁴ These arrangements are part of the institutional support from the IMF and are not included as part of the bilateral assistance we track as part of our data. However, the IMF established the multi-donor Administered Account for Ukraine on April 8, 2022, to facilitate bilateral financial aid. The account serves as “a secure vehicle to direct financial assistance to Ukraine”, and “the account is available for use by any other members as well as intergovernmental agencies and organizations who wish to use it as a vehicle to provide financial assistance to Ukraine”.⁵⁵ Notable users include Canada, which has directed about C\$4.35 billion in loans through the Administered Account, as well as smaller loans from the Netherlands for €200 million, and a €1 billion grant from Germany. There is little public information on the functioning or status of this Administered Account; IMF financial reports indicate that it operates on a pass-through basis, with funds provided in donor currencies used to acquire Special Drawing Rights (SDRs) then transferred to Ukraine’s SDR holding account.

United Nations

United Nations (UN) programs tend to be one of the primary channels for the financing of humanitarian aid projects both for multiple donor countries and multinational institutions, thus making a distinction on direct aid to Ukraine difficult. The first stage of UN coordinated assistance was on February 24, 2022, when the Central Emergency Response Fund (CERF) was announced. CERF is a humanitarian fund established by the United Nations General Assembly but funded through voluntary contributions by individual nations and institutions.⁵⁶ Through the CERF, \$60.5 million in rapid-response humanitarian assistance for Ukraine and neighboring countries has been allocated.⁵⁷ A further \$30 million was pledged for the Ukraine Humanitarian Fund.⁵⁸ Because donations to CERF are made at the organization level and not for specific project allocations, we do not consider contributions by donors as bilateral assistance to Ukraine in our data. In a similar manner, the Ukraine Humanitarian Fund (UHF) is a “country-based pooled fund” which receives unearmarked funds for allocations in support of humanitarian needs such as those outlined in the Ukraine Humanitarian Response Plan. In 2023, \$181 million in contributions were made to UHF by global donors (including private). Given the broad use of these funds, including for cross-border humanitarian needs, we do not track these unearmarked contributions.

In 2022 and 2023, United Nations Office for the Coordination of Humanitarian Affairs (UN OCHA) set up allocation mechanisms, known as coordinated plans. Coordinated plans are a part of UN humanitarian program cycles for a given country, and earmark donations both from the above-mentioned funds as well as from individual donors for specific projects. For Ukraine, these were the Ukraine Flash Appeal 2022 and the Ukraine Humanitarian Response Plan 2023. The Flash Appeal and the Humanitarian Response Plan report individual flow level donations for projects, which allows to identify total bilateral contributions for projects earmarked for Ukraine. The Flash Appeal in 2022 raised \$3.74 billion from all

⁵² [IMF Press Release, March 2022](#)

⁵³ [IMF Press release, October 2022](#)

⁵⁴ As of December 31st, 2023, disbursements under IMF arrangements had been made for a total of 3.34 billion SDRs in 2023 and 2.01 billion SDRs in 2022, according to IMF data on Ukrainian transactions with the IMF.

⁵⁵ [IMF Press release, April 2022](#)

⁵⁶ [United Nations Central Emergency Fund](#)

⁵⁷ [United Nations Central Emergency Fund](#)

⁵⁸ [United Nations Office for the Coordination of Humanitarian Affairs](#)

donors (including private donors and those not tracked in our data), and the Humanitarian Response Plan in 2023 raised \$2.69 billion.

These programs are implemented both through international partners (World Food Program, the United Nations Development Program, the UN Food and Agriculture Organization), as well as international and local NGOs.⁵⁹ However, commitments from our tracked donors in this context will typically derive from previously allocated parts of the humanitarian or development cooperation funding. Furthermore, reported commitments by donor governments on humanitarian items are relatively less detailed.

European Bank for Reconstruction and Development (EBRD)

On March 9, 2022, the European Bank for Reconstruction and Development (EBRD), an international organization owned by European and non-European shareholder countries, announced an original support package for Ukraine and neighboring countries totaling \$2 billion. The package includes deferred loans, liquidity support, and trade finance, but there were few further details available at the time.⁶⁰ Additional planned support was announced during the G7 meeting in Petersburg on May 20, increasing the initial commitment by up to €1 billion (G7 Germany, 2022). On October 23rd, 2024, the EBRD confirmed that it had met its financing target for Ukraine for 2022-23 of \$3 billion.⁶¹ The primary mechanisms for channeling support are the Ukraine Crisis Response Fund (CRSF) and the Ukraine Stabilisation and Sustainable Growth Multi-Donor Account (Ukraine MDA). The CRSF, established in July 2022, has thus far mobilized about €1 billion from 11 donors including France, Canada, Italy, Japan, Norway, Switzerland, the United Kingdom, Germany, Netherlands, Denmark, and the US, with the US providing a core contribution of \$500 million. The Ukraine MDA was established in 2014 and has only been partly used since 2022 to provide bilateral support to Ukraine. In our data, examples of tracked support include a €10 million contribution in grants from Austria, €10 million from the US, €2.5 million from the Netherlands and CHF3 million from Switzerland in 2022, as well as a €2 million from Latvia in 2023.

International energy initiatives

Aside from the above-mentioned international organizations, we track bilateral donations to several other smaller international funds and initiatives. The International Atomic Energy Agency (IAEA) ensures safe and secure operation of Ukraine's nuclear power plants under the threat of military conflict. As of January 15th, 2024, we have tracked over €14 million in contributions by donors, including a €3.5 million donation by Germany and a €2 million donation by Belgium. The Ukraine Energy Support Fund (UESF) is a fund managed by the Energy Community Secretariat, the independent executive institution of the Energy Community, an international organization to which Ukraine and the European Union are members. The Secretariat acts as the fiduciary of the Fund as well as an intermediary between the donors and the Ukrainian authorities.⁶² The fund is set up to match demand for financing procurement of necessary equipment, fuels and services for Ukrainian energy companies. As of January 15th, 2024, we have tracked €353 million in bilateral donations to finance these objectives.

⁵⁹ [United Nations source](#)

⁶⁰ [EBRD source](#)

⁶¹ [Press release](#) on the funding objective.

⁶² Information on the governance of the Fund [here](#).

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