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In its continuing efforts to improve transparency around U.S. arms sales abroad, the Security Assistance Monitor (SAM), a project of the Center for International Policy (CIP), is announcing the use of a new data source in order to better monitor arms deliveries. This new data source, drawn from the Census Bureau's Automated Export System (AES) database, will give journalists, policymakers, and civil society a significantly more granular look into what arms are actively leaving the U.S. and being shipped abroad, and when.

THE PROBLEM

In previous years, the U.S. government reported reasonably detailed delivery data for Foreign Military Sales (FMS). The Defense Security Cooperation Agency (DSCA) Historical Sales book used to provide granular deliveries data that made clear at what stage in the process sales were being reported, but since 2018 only includes country totals without additional context. For direct commercial sales (DCS), the annual 655 report includes some so-called "shipped value," but it is very low relative to total authorizations and likely relies on voluntary reporting. It is also not broken out by arms category in any way. The end result of this decreasing transparency is that since 2018, the arms deliveries numbers in the SAM database were implausibly low and lacked detail.[1] The graph below shows this drop-off in visibility quantitatively.

Arms Deliveries, old SAM data sources
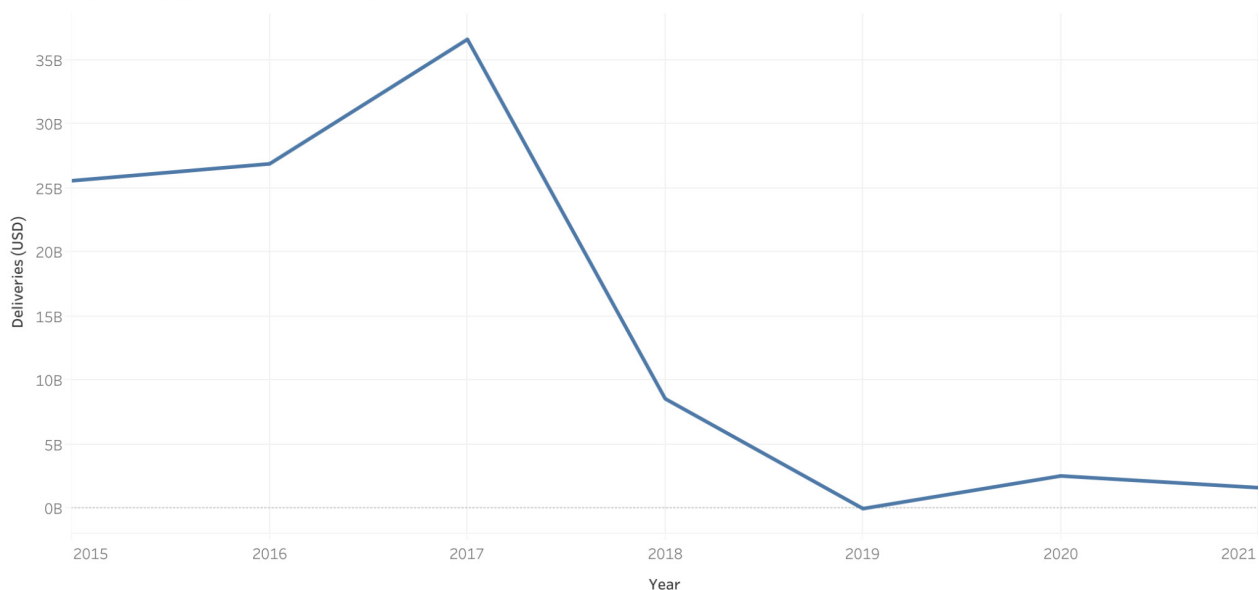
1. The numbers were implausibly low relative to total authorizations: it is unlikely that nearly every arms exporter would go through the work of being authorized to export a certain amount of items and then consistently only export ~10-20% of the authorized value.

THE SOLUTION

In order to get as close as possible to the pre-2018 level of transparency on arms deliveries, we turned to a new data source, the Census Bureau's Automated Export System (AES) database.

Where does the new data come from?

Generally, exporters are required to file an AES report with Customs and Border Protection (CBP) when their items are actually leaving the country, and these reports are aggregated by commodity and available in an easily-accessible, machine readable format on usatrade. census.gov.

How complete is this new data source?

Though statutorily required to include both FMS and DCS, a 2010 Government Accountability Office (GAO) report found that FMS data in the AES database was incomplete. Hopefully some progress has been made on this issue since the publication of the GAO report, and even if FMS data remains incomplete, the database provides far more information than any other plausible publicly-available substitute. Exporters of United States Munitions List (USML)-controlled items are required to report the USML category on their AES forms (called a DDTC USML code by CBP) but this data is not publicly available. Instead, we mapped USML categories to the Harmonized System (HS) commodity code publicly reported by Census in the database. These mappings are imperfect, but for many items, especially some of the most high-value ones, like aircraft parts, they map neatly to the USML.

Does this data source have other advantages?

This dataset also has the advantage of being relatively unaffected by the recent move of certain semi-automatic weapons from the USML to the CCL. Both USML and CCL controlled items are listed in the AES database, allowing SAM to provide transparency on so-called "Commerce Arms Sales" deliveries as well.

As the figure below shows, using this new data source gives us increased information on tens of billions of dollars' worth of arms sales. This is an important step for transparency, since many deals take so long to conclude: this shows when weapons are actually leaving the United States en route to foreign countries.

Arms Deliveries, current SAM data from AES database
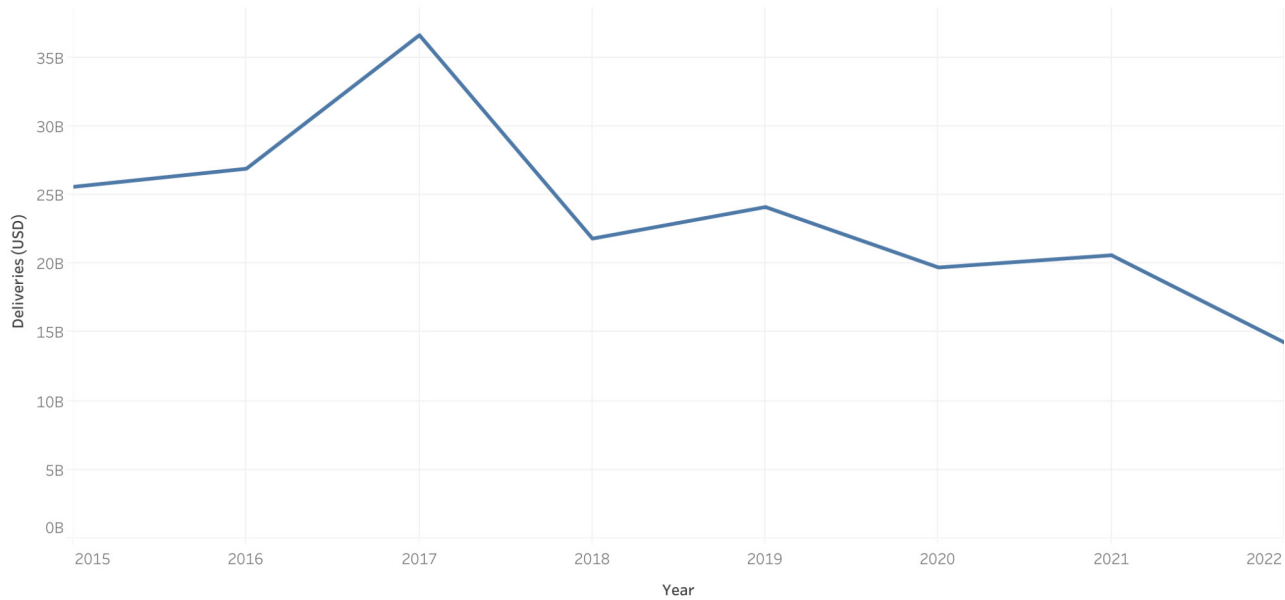
METHODOLOGY

The main effort in incorporating this data source was mapping USML categories to HS codes. These are two different classification systems with two different goals, and thus any mapping between them will inevitably be imperfect. For some items, like arms and ammunition, the HS codes are quite detailed and we have high confidence about the mappings. For others, especially electronics, the HS categories are not divided in a way that makes mapping possible. In general, we tried not to consistently err in one direction or another, but to pick mappings that would mostly closely approximate the true value. Comparing our mapped data from the AES database to older deliveries data from other sources gives similar numbers, which suggests that the mappings are at least coarsely correct. We used the 10-digit HS codes for all items to avoid double-counting. Note that NESOI is short for "Not Elsewhere Specified or Indicated."

The quantity field for this data is not always individual items and will be specified in the item name.. For example, if an entry says "Military Rifles (no)," then quantity refers to the number of rifles. Some items are measured by weight instead of count, which will also be specified. Also note that "amount" (value in US dollars) is not adjusted for inflation.

The following table makes explicit our mapping decisions:

USML Category	HS Code(s)
Category I: Firearms, Close Assault Weapons and Combat Shotgun	Fully encompassed by 93: Arms and Ammunition. We included all subcategories of 93 with the exception of muzzleloaders and cartridges for riveting. We include rimfire rifles and spring pistols since they do have some obscure military uses such as for training or special operations. Note that this category also includes items that were recently moved from the USML to the CCL and other "sporting" firearms. It may be a slight overcount overall.
Category II: Guns and Armament	Same as above.
Category III: Ammunition/Ordnance	Same as above.
Category IV: Launch Vehicles, Guided Missiles, Ballistic Missiles, Rockets, Torpedoes, Bombs, and Mines	Mostly encompassed by 93: Arms and Ammunition, but also we include 8802509020/8802609020, military spacecraft & suborbital and space launch vehicles (excluding communication satellites), and 8412100010, missile & rocket reaction engines, as well as 8412100090, reaction engines except missile and rocket engines. This will be a mild overcount since there are some civilian applications for these technologies.
Category V: Explosives and Energetic Materials, Propellants, Incendiary Agents, and Their Constituents	Should be encompassed by 36: Explosives, Pyrotechnics, Matches, Pyro Alloys, etc., excluding categories 3605 and 3606. This will likely be an overcount even excluding those categories since there are civilian applications of some explosives. There are many other things that could hypothetically fall through the cracks towards undercounting, however, including certain types of fuel categorized on the USML that aren't separable on AES (no additives like Boron are included in the AES fuel list).
Category VI: Surface Vessels of War and Special Naval Equipment	890610 Warships and 890600 Vessels NESOI Including Warships. Note that this also includes submarines, which are a separate USML category. This is likely a mild overcount since Vessels NESOI includes some non-warships as well (though the other categories of non-warship are fairly detailed, so likely not many civilian vessels are NESOI).

Category VII: Ground Vehicles	Covered by category 8710. Vehicle armor not attached to vehicles might be counted under "parts" for this category but it's unclear. Likely a mild undercount.
Category VIII: Aircraft and Related Articles	We included all explicitly military subcategories under HS 88. This is the highest confidence category as military and civilian equipment is separated in each individual subcategory. Also includes items like deck-arrest gear for carrier-borne aircraft and 880521, air combat simulators.
Category IX: Military Training Equipment and Training	Other than 880521, air combat simulators, other training equipment is not broken out by HS code. This is a serious undercount.
Category X: Personal Protective Equipment	Though there is public information about how to classify body armor by HS code, it is impossible to distinguish it from other clothes and/or other metal/ceramic plates, which have too many uses to include here. Similarly, in the HS system items like bulletproof helmets are impossible to distinguish from items like hard hats. This category is completely excluded, leading to a major undercount.
Category XI: Military Electronics	8526100070, Radar apparatus NESOI is the only HS code we've included under this category since ship/boat radars & civil aircraft radars are separate categories. We decided not to include ship/boat radars which means we're likely undercounting military ship radars, but since civilian ships vastly outnumber military ships this should minimize total error. A number of other extremely specific electronic devices exist in this category with no HS code. This will be a significant, maybe quite large, undercount.
Category XII: Fire Control, Range Finder, Optical and Guidance and Control Equipment, Night vision goggles	We've included 852583, night vision, 900510020, binoculars with IR, 9005804020, IR telescope, and 901510, rangefinders. All of these items have civilian uses so this category is overcounted.
Category XIII: Materials and Miscellaneous Articles	None of these specific items have matching HS codes, so this category is completely undercounted.

Category XIV: Toxicological Agents, Including Chemical Agents, Biological Agents, and Associated Equipment	Though there are HS codes for numerous biological and chemical items, none is specific enough to identify toxicological vs other agents. We have left this category out completely, which is an undercount, but likely an extremely small one since not very much of this material is exchanged.
Category XV: Spacecraft and Related Articles	Should be fully captured by 8802509020/8802609020, military spacecraft & suborbital & Space launch vehicles, mentioned above.
Category XVI: Nuclear Weapons Related Articles	Counting 284420 Enriched Uranium, 284430 depleted uranium, 284450 spent fuel rods, and the entirety of 8401 Nuclear reactors, including 840120 isotopic separation machinery. This is potentially a significant overcount, as many of these materials have civilian uses, but due to their importance we have erred on the side of overreporting. Note that depleted uranium has a number of conventional military uses and is included for that reason.
Categories XVII: Classified Articles, Technical Data, and Defense Services Not Otherwise Enumerated and XVIII: Directed Energy Weapons	No equivalent HS codes, completely undercounted but likely small dollar value.
Category XIX: Gas Turbine Engines and Associated Equipment	The USML and HS engine thrust thresholds for items are different, but this category is separated into military and civilian so should be very close to an accurate count. 8411124050 Turbojet /c turbines ex civil, thrust over 25 Kn, 8411224050 turboprop ex civil also, 841182 gas turbine, ex civil subcategory. Similarly with props.
Category XX: Submersible Vessels and Related Articles	Should be mostly captured by warships above, might be a slight undercount.
Category XXI: Articles, Technical Data, and Defense Services Not Otherwise Enumerated	No corresponding HS code, not included. Should not be significant.