

Data appendix to *Chicago Fed Letter* No. 493 and No. 494

Privately placed debt on life insurers' balance sheets

Anne Fournier, research assistant, Ralf Meisenzahl, senior economist and economic advisor, and Andy Polacek, senior business economist

As part of our two-part series of *Chicago Fed Letter* articles, we created a novel data set using a string-matching algorithm to map life-insurer-held private placement securities to the private companies that issued them. This process gives us unique insight into the changing composition of life insurers' private placement investments, including the types of companies and industries they invest in. We detail this data sources and methods used to create this novel data set below.

Data sources

Detailed data on insurers' CUSIP (Committee on Uniform Security Identification Procedures)-level bond holdings and other insurer balance sheet information comes from the National Association of Insurance Commissioners (NAIC) statutory filings provided by S&P Market Intelligence. Data on public issuer bond characteristics comes from Mergent Fixed Income Securities Database (FISD) provided by Wharton Research Data Services (WRDS). Data on private issuer companies comes from the S&P Capital IQ Pro Company database.

Identifying private placements

Insurance companies report individual security level holdings in their annual statutory filings. Detailed information on bonds and securitizations are reported on Schedule D of these NAIC statutory filings. In the Schedule D filings, securities are identified by a nine-digit CUSIP; the CUSIP is a unique security identifier where the first six digits identify the issuer of the security, digits 7 and 8 identify the individual security issuance, and digit 9 is a check-digit, which confirms the CUSIP is real. We identify private placement securities by the presence of a "special character" ("*", "@," or "#") in the sixth, seventh, or eighth position of the security's CUSIP. We also use this information to separate private placements in our issuer subsets: public issuer, private issuer, and foreign issuer.

A1. Identifying private placements and issuer types from CUSIP digits

Issuer type	CUSIP characteristics
Public	Special character in issue CUSIP, 7th or 8th digit
Private	Special character in issuer CUSIP, 6th digit
Foreign	1st CUSIP digit is a letter (A–Z), special character in 6th, 7th, or 8th digit

Note: The (A–Z) letter in the 1st digit of foreign issuer private placement also identifies the country of issuance.

Source: [CUSIP Access](#).

Bonds and securitization information

We identify private placement bonds and private placement asset-backed securities (ABS) using issuer and issue information reported in the Schedule D filings. We identify corporate issuance using the issuer

type variable, which allows insurers to identify whether an issuer is a corporate, municipal, the U.S. government, or a foreign government issuer. This information is not always reported consistently across insurers, so we use the most frequently reported issuer type for each nine-digit CUSIP.

We identify corporate bonds and private ABS using the annual asset type variable. Here corporate bonds are identified where the asset type listed is a “long-term bond” or a related entry, while private ABS are identified where the asset type listed is an “asset-backed security” or a related entry. For consistency, we once again use the most frequently reported asset type for each nine-digit CUSIP.

To identify the credit ratings of each individual CUSIP, we rely on the NAIC designation variable reported in the Schedule D filings. Beginning in the 2020 year-end filings, insurers were required to report the notch-level (A+, A, A–, etc.) equivalent rating for each CUSIP. Prior to 2020, ratings reported in the *NAIC designation* field were less granular with only six NAIC rating buckets. For example, the NAIC 1 bucket included all AAA–, AA–, and A-rated issues and NAIC 2 included all BBB ratings. For publicly traded bonds, the reported *NAIC designation* is based on the bond rating from credit-rating firms such as S&P, Moody’s, and Fitch. Private placement issuance is [rated](#) by the NAIC’s Security Rating Office (SRO) and given an NAIC designation.

Floating rate issuance is identified by the “interest rate type” field reported in Schedule D.

Industry information

Public issuer

For publicly traded corporate bonds and public issuer private placements, we match securities at the issuer CUSIP level to the Mergent FISD and obtain North American Industry Classifications (NAICS) codes.¹ We then identify issuer industries using the two-digit NAICS code. At the two-digit NAICS code level, we separate out utilities and infrastructure (22), finance and insurance (52), and real estate (53), and label the remainder as general nonfinancial.

Private issuer

To identify the industries of private issuer private placements, we perform a novel string-matching exercise using a version of the fedmatch algorithm.² In this exercise, we match issuer names reported in the Schedule D filings with private company names and their industries from the S&P Capital IQ Pro database using the fuzzy match version of the fedmatch algorithm. We chose the fuzzy match version because it produces a higher match rate than exact match versions and errors are likely to be within-industry.

String cleaning

To begin the exercise, we clean the issuer names provided in the Schedule D filings in the following steps:

1. Standardize shortened names, such as “airls” into “airlines,” “amz” into “Amazon,” or “fds” into “funds.” This is a complement to the standardization performed in fedmatch.

¹ Detailed information on NAICS codes is [available online](#).

² Information on the approach we used for the string-matching algorithm is [available online](#).

2. Remove noninformational characters and words (i.e., “and,” “&,” “–,” “the,” “secured,” “issuer,” etc.). This is in addition to the removals performed in fedmatch.
3. Manually correct and standardize the names of some large issuers, which match-listed company names in the S&P Capital IQ Pro database. For example, “A & E” into “A and E Television Network” and “Clarion Lion” into “Clarion Lion Properties Fund.”

We then repeat steps 1 and 2 for the S&P Capital IQ Pro database.

String matching

Next, we match the cleaned issuer names from the Schedule D filings to the cleaned private company names from the S&P Capital IQ Pro database. We perform the match using the fuzzy match version of fedmatch and use Weighted Jaccard Similarity as our measure of distance.³

The fuzzy matching algorithm allows us to match the two “closest” set of strings in each data set by creating a numerical measure of similarity between each set of strings in the two data sets. The match is then defined as two sets of strings with the least distance between one another. The distance will range from 0, exact match, to 1, no similarity, where minimum distance required for a match to occur can be defined to fit the quality needs of the matching exercise.

For our measure of distance, we chose the Weighted Jaccard Similarity measure with the default minimum required distance of 0.05. This measure is an extension of the Jaccard Similarity measure, which compares the set of letters in two strings and computes the distance between the two strings. If the strings share all the same letters, then the distance is 0, and if they share no letters the distance is 1. In contrast, the Weighted Jaccard Similarity compares the words in each string and weights the matched words between each string by the frequency that those words appear in the provided data sets. Thus, a match on a common word such as “LLC” or “Company” will be less important than a more unique word such as “Amazon” or “Hardwood.”

Industry comparison

Finally, to compare industry composition between public and private issuer private placements, we create a crosswalk between two-digit NAICS codes for utility and infrastructure, finance, and real estate and the S&P industry classifications.

³ Details of the fuzzy matching version of fedmatch are [available online](#).