

Codebook for the Database on Ideology, Money in Politics, and Elections (DIME) (Version 3.1)

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Description:

The Database on Ideology, Money in Politics, and Elections (DIME) provides a general resource for the study of campaign finance and ideology in American politics. The database was developed as part an on-going effort to construct a comprehensive ideological mapping of political elites, interest groups, and donors. Constructing the database required a large-scale effort to compile, clean, and process data on contribution records, candidate characteristics, and election outcomes from various sources. The current database contains over 500 million itemized political contributions made by individuals and organizations to local, state, and federal elections covering from 1979 to 2022. A corresponding database of candidates and committees provides additional information on state and federal elections.

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For CFscore measures, please cite:

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For DW-DIME measures, please cite:

Bonica, Adam. 2018. “[Inferring Roll-Call Scores from Campaign Contributions Using Supervised Machine Learning](#)” *American Journal of Political Science*, 62, (4): 830-848.

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1 Introduction

A core objective in constructing the database was to make data on campaign finance and elections (1) more centralized and accessible, (2) easier to work with, and (3) more versatile in terms of the types of research questions that can be addressed. To these ends, I have put a great deal of effort into compiling, processing, and augmenting the database. In making the database public, I hope to provide a valuable resource to fellow researchers. A list of the main value-added features of the database is below:

Data processing: Names, addresses, and occupational and employer titles have been cleaned and standardized.

Unique identifiers: Entity resolution techniques were used to assign unique identifiers for all individual and institutional donors included in the database. The contributor IDs make it possible to track giving by individuals across election cycles and levels of government. Additionally, unique identifiers are assigned to candidates, PACs, and others individuals/groups receiving donations.

Geocoding: Each record has been geocoded and overlaid onto congressional districts. The geocoding scheme relies on the contributor IDs to assign a complete set of consistent geocoordinates to donors that report their full address in some records but not in others. This is accomplished by combining information on self-reported address across records. The geocoding scheme further takes into account donors with multiple addresses.

Ideological measures: The common-space DIME scores (CFscores) allow for direct distance comparisons of the ideal points of a wide range of political actors from state and federal politics spanning over 40 years. In total, the database includes ideal point estimates for 156,514 candidates and 37,083 political committees as recipients and 36.2 million individuals and 2.9 million organizations as donors. These measures of ideology have been extensively validated across several studies spanning a variety of institutional settings and types of actors. A compendium of these validation results can be accessed [here](#).

Corresponding data on candidates, committees, and elections: The recipient database includes information on fundraising statistics, election outcomes, gender, and other candidate characteristics. All candidates are assigned unique identifiers that track candidates when they run for different offices/districts. The recipient IDs can also be used to match against the database of contribution records. The database also includes entries for PACs, super PACs, party committees, leadership PACs, 527s, state ballot campaigns, and other committees that engage in fundraising activities.

2 Release Notes

- Updated FEC data for federal elections through 2022.
- Updated state records through 2022 using NIMSP/CRP data.
- Various improvements made to identity resolution algorithms to enhance accuracy.
- DW-NOMINATE scores updated through 118th Congress.
- DW-DIME scores updated through 2022.
- Added vote shares from the FEC for congressional primary and general elections through 2020.
- Added SQLite version of the database.

- Updated ideal point estimation algorithm for CFscores scores to adjust for over time changes across election cycles. (See section on Adjusted CFscores scores).
- Updated state-to-federal bridging algorithm that uses a supervised machine learning approach as an initial stage.

3 List of Data Files

Candidate/Recipient Files: The main recipient file includes cycle-specific entries for all candidates and committees included in the scaling. The raw candidate/recipient file additionally includes cycle-specific entries for candidates and committees that did not meet the requirements for inclusion in the scaling—including labor, corporate, and trade PACs that were excluded from the estimation stage and candidates that did not raise funds from the required number of contributors to be included in the scaling.

- `dime_recipients_1979_2022.csv` - Candidate/Recipient DIME scores (included in scaling) - State, Federal, 1979-2022 data file
- `dime_recipients_all_1979_2022.csv` - Candidate/Recipient DIME scores (all candidates) - State, Federal, 1979-2022 data file

Contributor Files: Includes entries for each individual and organization that has made political contributions

- `dime_contributors_1979_2022.csv` - State, Federal, 1979-2022

Contribution Records: Contains the itemized contribution records grouped by election cycle. An additional set of files contains records organized by seat type. These files contain all contribution records associated with (1) gubernatorial, (2) judicial, or (3) presidential candidates.

Itemized contribution records grouped by cycle:

- `ContribDB_1980.csv` (Row count: 458,213)
- `ContribDB_1982.csv` (Row count: 315,358)
- `ContribDB_1984.csv` (Row count: 435,333)
- `ContribDB_1986.csv` (Row count: 476,241)
- `ContribDB_1988.csv` (Row count: 654,958)
- `ContribDB_1990.csv` (Row count: 1,032,788)
- `ContribDB_1992.csv` (Row count: 1,510,171)
- `ContribDB_1994.csv` (Row count: 1,791,484)
- `ContribDB_1996.csv` (Row count: 3,172,310)
- `ContribDB_1998.csv` (Row count: 5,871,178)
- `ContribDB_2000.csv` (Row count: 7,502,023)
- `ContribDB_2002.csv` (Row count: 12,041,029)

- `ContribDB_2004.csv` (Row count: 17,422,202)
- `ContribDB_2006.csv` (Row count: 21,967,438)
- `ContribDB_2008.csv` (Row count: 25,564,194)
- `ContribDB_2010.csv` (Row count: 25,416,826)
- `ContribDB_2012.csv` (Row count: 38,408,216)
- `ContribDB_2014.csv` (Row count: 35,577,612)
- `ContribDB_2016.csv` (Row count: 54,311,783)
- `ContribDB_2018.csv` (Row count: 50,399,582)
- `ContribDB_2020.csv` (Row count: 228,473,349)
- `ContribDB_2022.csv` (Row count: 156,804,394)

Itemized contribution records grouped by seat type:

- `contribDB_governor.csv` (Row count: 19,291,245)
- `contribDB_judicial.csv` (Row count: 2,301,648)
- `contribDB_president.csv` (Row count: 86,635,592)

Contingency Matrix of Contribution Amounts: Includes an R list object organizes the contribution data into an n by m contingency matrix of contribution amounts.

- `mimp.rdata` - Sparse matrix of contribution amounts

DIME SQLite Database: A single SQLite file that combines the above files in a single SQL database. This is the best format for working with the database on memory restricted machines. The file will reside on disk rather than memory and can be accessed using the SQLite interface functionality of R or Python. The SQLite database includes pre-built indexes for key variables.

For a primer on how to interface with the SQLite database in R, see the following example code: [dime_sqlite_v3_example.R](#)

Extensions: The DIME+ data repository on congressional activity extends DIME to cover detailed data on legislative voting, lawmaking, and political rhetoric. (See <http://data.stanford.edu/dime-plus> for details.)

Identifying sets of important political actors: Contribution records have been matched onto other publicly available databases of important political actors. Examples include:

- Fortune 500 directors and CEOs ([Data](#)) ([Paper](#))
- State supreme court justices ([Data](#)) ([Paper](#))
- Federal court judges ([Data](#)) ([Paper](#))
- Executives appointees to federal agencies ([Data](#)) ([Paper](#)).
- Medical professionals ([Data](#)) ([Paper](#))

Each of the above are available for download. (Note that some of these curated datasets have been compiled using previous versions of DIME.)

4 Data Sources

Federal Elections: Contribution records, candidate and committee filings, and election outcomes for federal elections are from the Federal Election Commission (FEC).

State Elections: Contribution records, candidate and committee filings, and election outcomes for state elections are provided by the Center for Responsive Politics (CRP) and the National Institute for Money in State Politics (NIMSP). This data is licensed under the Creative Commons Attribution-Non-commercial-Share Alike 3.0 United States License. When using data on state elections, please attribute credit accordingly. State-level data for some states between 2014-2018 includes records from web scrapers and bulk data pulls from state campaign finance reporting agencies in addition to records from the NIMSP.

527s: Donation records to 527s are from the Center for Responsive Politics (2002-2010) and the IRS (2011-2020). The Center for Responsive Politics licenses its data under the Creative Commons Attribution-Non-commercial-Share Alike 3.0 United States License. Please attribute credit accordingly.

Other Data:

DW-NOMINATE scores are provided by Keith Poole and Howard Rosenthal and are available for download at <http://www.voteview.com>.

Cite: Poole, Keith T., and Howard Rosenthal. 2007. *Ideology & Congress*. 2nd rev. ed. New Brunswick: Transaction Publishers.

Data on historical boundaries for congressional districts are from:

Jeffrey B. Lewis, Brandon DeVine, Lincoln Pitcher, and Kenneth C. Martis. (2013) Digital Boundary Definitions of United States Congressional Districts, 1789-2012. Version 1.2 (March 20, 2015). Retrieved from <http://cdmaps.polisci.ucla.edu>.

Shape files for census tracts are from Census.gov: (<http://www.census.gov/rdo/data/>).

5 Variable Codings

5.1 Candidate/Recipient Database

The candidate/recipient database includes information on voting records, fundraising statistics, election outcomes, and other candidate characteristics. All candidates are assigned a unique identifiers that track them as they move across offices. The recipient IDs can also be used to match against the database of contribution records. The database also includes entries for PACs, super PACs, leadership PACs, 527s, state ballot campaign committees, and other recipient committees that engage in fundraising activities. Entries for candidates with two or more active fundraising committees during a given election cycle have been de-duped. The methodology used to estimate common-space DIME scores (or CFscores) for contributors is described in “Mapping the Ideological Marketplace” (Bonica 2014). The methodology used to estimate the DW-DIME scores is described in “Inferring Roll-Call Scores from Campaign Contributions Using Supervised Machine Learning” (Bonica 2018).

Variable Descriptions:

- 1) **election**: Election cycle preceded by two-letter state code. Federal candidates have 'fd' as the state code.
- 2) **cycle**: Four digit number that indicates the two-year election cycle during which the contribution was recorded.
- 3) **fecyear**: Year listed by the FEC indicating the year of campaign's the target election. The 'election' variable indicates the election cycle during which the contribution was received. But the election can occur in a future cycle—as is the case for senators that fundraise during their first four years in office.
- 4) **bonica.rid**: Unique ID assigned to candidates/recipients. Each candidate/recipient receives a unique ID that is constant across election cycles, levels of government, and offices sought. With the exception of party-switchers the bonica.rid values have a one-to-one correspondence with the ICPSR2 scores. (Use this variable to merge with the database of contribution records).
- 5) **bonica.cid**: The unique contributor ID for the candidate. This variable can be used to match candidates with their personal contributions records. (Note: The construction of this variable is not yet complete. It includes a partial set candidates that could be easily linked with their contribution records using an automated matching scheme. Missing values do not necessarily mean that a candidate has not made contributions).
- 6) **name**: Name of the candidate/recipient.
- 7) **lname**: Last name of the candidate/recipient.
- 8) **ffname**: Concatenates first name, middle name, suffix, and title.
- 9) **fname**: First name of the candidate/recipient.
- 10) **mname**: First name of the candidate/recipient.
- 11) **title**: Title of the candidate/recipient. (e.g. Mr., Mrs., Dr., Esq).
- 12) **suffix**: Suffix of the candidate/recipient.
- 13) **party**: Party of candidate/recipient (100 = Dem, 200 = Rep, 328 = Ind).
- 14) **state**: Two-letter state abbreviations.
- 15) **seat**: Office sought. Committees are listed as federal:committee. See section on seat codes below.
- 16) **district**: District code: two-letter state code followed by congressional district number. District numbers for senate candidates take on the value of 'S' followed by the year of the seat will be up for election.
- 17) **ico.status**: Incumbency status. ('I' = Incumbent, 'C' = Challenger, 'O' = Open Seat Candidate, '-' - not up for election).
- 18) **cand.gender**: Candidate gender codings. (With the exceptions of candidates that have served in Congress, all gender codes are based on an automated coding scheme that incorporates information gender ratios of first names as reported by the U.S. Census and gender-specific titles (e.g. Mrs., Mr., Jr., Sr.) reported in the contribution records.
- 19) **recipient.cfscore**: Estimated ideology of candidate/recipient based on donations received.

- 20) `recipient.cfcores.dyn`: Period-specific estimates of ideology. (Candidate/recipient scores are re-estimated in each election cycle while holding contributor scores constant.)
- 21) `contributor.cfscore`: Estimated ideology of candidate/recipient based on their personal donations given to other candidates/recipients.
- 22) `dwdime`: DW-DIME scores for recipients. These scores are described in detail in “Inferring Roll-Call Scores from Campaign Contributions Using Supervised Machine Learning” Bonica (2018).
- 23) `dwnom1`: (voteview.com) First dimension common-space DW-NOMINATE score. (Based on joint scaling of the 1st to the 117th Congresses.)
- 24) `dwnom2`: (voteview.com) Second dimension common-space DW-NOMINATE score.
- 25) `ps.dwnom1`: (voteview.com) First dimension Nokken-Poole period-specific DW-NOMINATE score. (Scores for the House and Senate are scaled separately and thus should not be directly compared.)
- 26) `ps.dwnom2`: (voteview.com) Second dimension Nokken-Poole period-specific DW-NOMINATE score.
- 27) `irt.cfcores`: Estimates of ideology for recipients/candidates from IRT count-model applied to PAC data. (See “Ideology and Interests in the Political Marketplace” Bonica (2013) for details.)
- 28) `num.givers`: Number of distinct donors that gave to the candidate during a specific election cycle.
- 29) `num.givers.total`: Number of distinct donors that gave to the candidate/recipient aggregating over the candidate/recipient’s career.
- 30) `total.receipts`: Sum total of contributions raised during an election cycle.
- 31) `total.disbursements`: Sum total campaign disbursements during an election cycle..
- 32) `total.indiv.contribs`: Sum total of itemized contributions from individuals raised during an election cycle.
- 33) `unitemized`: Sum of unitemized contributions from individuals raised during an election cycle.
- 34) `total.pac.contribs`: Sum total contributions raised from contributions from PACs and other committees.
- 35) `total.party.contribs`: Sum total raised from party committees.
- 36) `contribs.from.candidate`: Sum total raised from candidate self-contributions.
- 37) `ind.exp.support`: Sum total independent expenditures made to support the candidate.
- 38) `ind.exp.oppose`: Sum total independent expenditures made to oppose the candidate.
- 39) `prim.vote.pct`: FEC reported vote share in primary election. Primary election outcomes are only coded for federal congressional candidates.
- 40) `pwinner`: Primary election outcome (‘W’ = won election; ‘L’ = lost election). Primary election outcomes are only coded for federal congressional candidates. See `nimsp.candidate.status` for additional information on race outcomes for state elections.
- 41) `gen.vote.pct`: FEC reported vote share in general election.
- 42) `gwinner`: General election outcome (‘W’ = won election; ‘L’ = lost election). Election outcomes for congressional candidates are from the FEC. Election outcomes for state-level candidates are coded based on `nimsp.candidate.status`.

- 43) `s.elec.stat`: FEC special election code (W = Win) (L = Lose).
- 44) `r.elec.stat`: FEC run-off election code (W = Win) (L = Lose).
- 45) `district.pres.vs`: District-level percentage of the two-party vote share won by the Democratic presidential nominee in the most recent (or concurrent) presidential election.
- 46) `fec.cand.status`: Indicates the status of the candidate's campaign assigned by the FEC. ('C' = Statutory candidate; 'F' = Statutory candidate for future election; 'N' = Not yet a statutory candidate; 'P' = Statutory candidate in prior cycle).
- 47) `recipient.type`: ('cand' = candidate, 'comm' = committee).
- 48) `igcat`: FEC interest group category code (C = Corporation, L = Labor organization, M = Membership organization, T = Trade association, V = Cooperative, W = Corporation without capital stock).
- 49) `comtype`: FEC code for type of committee.
- 50) `ICPSR`: Adjusted ICPSR legislator ID. Candidates that have never served in Congress are assigned IDs based off of their candidate IDs assigned by the FEC, NIMSP, or state reporting agencies. The four-digit election cycle is appended to the ID. Candidates that are active in multiple election cycles (or file to run for multiple seats during a single election cycle) will appear multiple times. This variable provides a unique row identifier.
- 51) `ICPSR2`: Adjusted ICPSR legislator ID. Candidates that have never served in Congress are assigned IDs based off of their candidate IDs assigned by the FEC, NIMSP, or state reporting agencies. Party switchers are assigned new ICPSR2 IDs after switching parties. (See *before.switch.ICPSR* and *after.switch.ICPSR*.)
- 52) `Cand.ID`: The candidate ID assigned by the FEC or state reporting agency.
- 53) `FEC.ID`: The committee ID assigned by the FEC or state reporting agency campaign committee.
- 54) `NID`: (CRP/NIMSP) Unique candidate IDs assigned by the Center for Responsive Politics/National Institute for Money in State Politics.
- 55) `before.switch.ICPSR`: ICPSR ID prior to switching parties (included for party-switchers only).
- 56) `after.switch.ICPSR`: ICPSR ID after switching parties (included for party-switchers only).
- 57) `party.orig`: Original party before switch.
- 58) `nimsp.party`: (nimsp) three-letter party code assigned by the NIMSP.
- 59) `nimsp.candidate.IC0.code`: (nimsp) incumbency status assigned by the NIMSP.
- 60) `nimsp.district`: (nimsp) district number assigned by the NIMSP.
- 61) `nimsp.office`: (nimsp) state-office sought.
- 62) `nimsp.candidate.status`: (nimsp) election outcome.

5.2 Contributor Database

Includes rows for individuals and organizational donors included in the database. *Note that all donors are assigned ideal point estimates, including one-off donors who contributed only to single candidate or committee.* The *is.projected* column is used to indicate donors that were excluded from the estimation stage and later projected onto the recovered space as supplementary observations. Contributors who have only given to a single recipient are assigned the ideal point of the recipient. Researchers should aware of this when deciding which donors/ideal points to include in their study. The *num.distinct* column indicates the number of observations that were used to estimate the contributors ideal point. Typically, donating to eight or more distinct recipients is sufficient to recover a reliable ideal point estimate.

Variable Descriptions:

- 1) `bonica.cid`: Unique contributor IDs for each donor in the database.
- 2) `contributor.type`: Contributor type ('I' = individual, 'C' - committee/organization).
- 3) `num.records`: The number of records in the contribution database by the donor.
- 4) `num.distinct`: The number of distinct recipients included in the scaling receiving contributions from the donor.
- 5) `most.recent.contributor.name`: Contributor's self-reported name from most recent record.
- 6) `most.recent.contributor.address`: Contributor's self-reported street address from most recent record.
- 7) `most.recent.contributor.city`: Contributor's self-reported name city/municipality on most recent record.
- 8) `most.recent.contributor.zipcode`: Contributor's self-reported zip-code (5 or 9 digits) from most recent record.
- 9) `most.recent.contributor.state`: Contributor's self-reported state from most recent record.
- 10) `most.recent.latitude`: Geocoded latitude from the most recent record.
- 11) `most.recent.longitude`: Geocoded longitude from the most recent record.
- 12) `most.recent.contributor.occupation`: Contributor's self-reported occupational title from most recent record.
- 13) `most.recent.contributor.employer`: Contributor's self-reported employer from most recent record.
- 14) `most.recent.transaction.id`: `transaction.id` value of the most recent record from the contribution database.
- 15) `most.recent.transaction.date`: date of the most recent record from the contribution database.
- 16) `contributor.gender`: Contributor gender ('F'=Female, 'M'=Male, 'U'=Uncoded/Unknown)
- 17) `is.corp`: Indicates whether the contributor is identified as either a corporate entity or q trade organization (only applies to committees). Takes on the value 'corp' for corporations and trade organizations and is blank otherwise. These donors are excluded from the scaling.
- 18) `contributor.cfscore`: Contributor CFscore.

- 19) `is.projected`: Indicates whether the was excluded from the estimation stage but was later projected onto the recovered space as supplementary observations. This will take on the value of 1 for PACs and organizations directly affiliated with corporations or trade organizations and individual donors who gave to a single recipient.
- 20) `first.cycle.active`: The first recorded cycle in which the donor was active.
- 21) `last.cycle.active`: The last recorded cycle in which the donor was active.
- 22) `amount.cycle.[YYYY]`: Total amount contributed in a given election cycle.

5.3 Contribution Database

The contribution database includes a complete set of contribution records grouped by election cycle. Each row represents an individual transaction between a donor and recipient.

NOTE: There are several columns of ID numbers for recipients. Use `bonica.rid` and `bonica.cid` as the default. The other columns are included so that the database can be linked back to other data sources.

Variable Descriptions:

- 1) `cycle`: Election Cycle.
- 2) `transaction.id`: A primary key that contains a unique transaction id for each record.
- 3) `transaction.type`: FEC code for transaction type. (See section below for details.)
- 4) `amount`: Dollar amount of the contribution.
- 5) `date`: Transaction date of the contribution.
- 6) `bonica.cid`: A unique contributor id assigned to each individual and organization in the database.
- 7) `contributor.name`: Complete name of contributor (last, first); suffix and title removed.
- 8) `contributor.lname`: Last name of contributor.
- 9) `contributor.fname`: First name of contributor.
- 10) `contributor.mname`: Middle name or initial of contributor.
- 11) `contributor.suffix`: Suffix of contributor (e.g. Jr., Sr.).
- 12) `contributor.title`: Title of contributor (e.g. Mr., Mrs., Dr., Esq).
- 13) `contributor.ffname`: Concatenates first name, middle name, suffix, and title.
- 14) `contributor.type`: ('I' = individual; 'C' = committee or organization).
- 15) `contributor.gender`: Contributor gender coding ('M' = male; 'F' = female; 'U' = unknown). Gender codes are based on an automated coding scheme that incorporates information gender ratios of first names as reported by the U.S. Census and gender-specific titles (e.g. Mrs., Mr., Jr., Sr).
- 16) `contributor.address`: Contributor's self-reported street address.
- 17) `contributor.city`: Contributor's self-reported name city/municipality.

- 18) `contributor.state`: Contributor's self-reported state.
- 19) `contributor.zipcode`: Contributor's self-reported zip-code (5 or 9 digits).
- 20) `contributor.occupation`: Contributor's self-reported occupational title.
- 21) `contributor.employer`: Contributor's self-reported employer.
- 22) `is.corp`: Indicates whether the contribution is made by a corporate entity or q trade organization (only applies to committees). Takes on the value 'corp' for corporations and trade organizations and is blank otherwise.
- 23) `recipient.name`: Name of the recipient candidate or committee.
- 24) `bonica.rid`: Unique ID for recipients. Can be matched against candidate database which contains more detailed information on candidates, elections, and constituencies.
- 25) `recipient.party`: Party of the recipient (100=DEM; 200=REP; 328 = IND). (Match against candidate database for more detailed party codings.)
- 26) `recipient.type`: ('CAND' = candidate; 'COMM' = PAC, organization, or party committee)
- 27) `recipient.state`: Two-letter state abbreviation of the recipients.
- 28) `seat`: Elected office sought by candidate.
- 29) `election.type`: ('P' = primary elections; 'G' = general elections).
- 30) `latitude`: Geo-location (latitude).
- 31) `longitude`: Geo-location (longitude).
- 32) `gis.confidence`: A measure of confidence of the accuracy of the GIS coordinates.
- 33) `contributor.district.90s`: Contributor's geocode mapping onto a congressional district with respect to boundaries for 1992-2000.
- 34) `contributor.district.00s`: Contributor's geocode mapping onto a congressional district with respect to boundaries for 2002-2010.
- 35) `contributor.district.10s`: Contributor's geocode mapping onto a congressional district with respect to boundaries after 2010. Includes updated district boundaries for 2022.
- 36) `censustract`: Contributor's geocode mapping onto a census tract.
- 37) `efec.memo`: Memo field from FEC electronic filings.
- 38) `efec.memo2`: Auxiliary memo field from FEC electronic filings.
- 39) `efec.transaction.id.orig`: Original transaction id from FEC electronic filings.
- 40) `bk.ref.transaction.id`: Indicates whether the contribution record previously appeared in the database. The value link back to transaction.id. This can be used to remove duplicate entries.
- 41) `efec.org.orig`: Original recipient name from from FEC electronic filings.
- 42) `efec.comid.orig`: Original committee ID from FEC electronic filings.
- 43) `efec.form.type`: Form type from FEC electronic filings.

- 44) `contributor.cfscore`: Contributor's ideal CFscore.
- 45) `candidate.cfscore`: Candidate/recipient's CFscore.

6 Candidate-Contributor Contingency Matrix

The file includes an R list object that contains sparse matrix objects that organize the contribution data into n by m contingency matrices of amounts where the rows index contributors, the columns index candidates/recipients, and each entry R_{ij} stores the total amount contributor i gives to recipient j . Note that the cell values do not represent raw dollar amounts. Rather, they are the transformed values used to recover the common-space CFscores. The transformation is based on a normalization scheme that helps to adjust for variation in contribution limits by converting contribution amounts to count values. The conversion is based on federal contribution limits. Contributions between \$1 and \$100 are coded as 1, contributions between \$101 and \$200 are coded as 2, and so on. Contributions of \$5,000 or greater are capped at 50. (See “Mapping the Ideological Marketplace” (Bonica 2014) for details.) Another set of sparse matrix objects report the raw dollar amounts for each cell.

The R list object contains four sparse matrices:

- `mimp$contrib.matrix` - Sparse matrix of count values with columns indexed by `bonica.rid.cycle`. (Includes separate columns for each candidate/recipient-cycle observation.)
- `mimp$cm` - Sparse matrix of count values with columns indexed by `bonica.rid`. (Collapses columns such that each candidate/recipient has a single column and cell values are aggregate amounts given across cycles.)
- `mimp$contrib.matrix.am` - Sparse matrix of raw dollar amounts with columns indexed by `bonica.rid.cycle`. (Includes separate columns for each candidate/recipient-cycle observation.)
- `mimp$cm.am` - Sparse matrix of raw dollar amounts with columns indexed by `bonica.rid`. (Collapses columns such that each candidate/recipient has a single column and cell values are aggregate amounts given across cycles.)
- `mimp$cands` - Candidate/recipient database as a data.frame object.
- `mimp$contribs` - Contributor database as a data.frame object.

7 Seat Labels

List of seat labels assigned to candidates with respect to their target office:

Candidates	
federal:house	U.S. House of Representatives
federal:senate	U.S. Senate
federal:president	U.S. President
state:upper	upper chamber of state legislature
state:lower	lower chamber of state legislature
state:office	state-wide office (see <code>nimsp.seat</code> detailed codes)
state:governor	governor
state:ltgov	lt. governor
state:secofstate	secretary of state
state:treasurer	treasurer/comptroller
state:attorneyg	attorney general
state:judicial	state courts
state:attorney	district attorney
state:education	board of education/superintendent
state:other	misc. offices
state:unknown	unknown
Committees	
federal:committee	federal committee
federal:527	527 organization
state:committee	state committee
state:ballot	state-level ballot measure committee
state:other:convention	convention committee

Note: Various local election seats are labelled as “local:” followed by a label for the type of office. These have not been standardized.

8 Transaction Codes

10 NON-FEDERAL RECEIPT FROM PERSONS LEVIN (L-1A)
11 TRIBAL CONTRIBUTION
12 NON-FEDERAL OTHER RECEIPT LEVIN (L-2)
13 INAUGURAL DONATION ACCEPTED
15 CONTRIBUTION
15C CONTRIBUTION FROM CANDIDATE
15E EARMARKED CONTRIBUTION
15F LOANS FORGIVEN BY CANDIDATE
15I EARMARKED INTERMEDIARY IN
15J MEMO (FILER'S \% OF CONTRIBUTION GIVEN TO JOIN
15T EARMARKED INTERMEDIARY TREASURY IN
15Z IN-KIND CONTRIBUTION RECEIVED FROM REGISTERED
16C LOANS RECEIVED FROM THE CANDIDATE
16F LOANS RECEIVED FROM BANKS
16G LOAN FROM INDIVIDUAL
16H LOAN FROM CANDIDATE/COMMITTEE
16J LOAN REPAYMENTS FROM INDIVIDUAL
16K LOAN REPAYMENTS FROM CANDIDATE/COMMITTEE
16L LOAN REPAYMENTS RECEIVED FROM REGISTERED EN
16R LOANS RECEIVED FROM REGISTERED FILERS
16U LOAN RECEIVED FROM UNREGISTERED ENTITY
17R CONTRIBUTION REFUND RECEIVED FROM REGISTERED
17U REF/REB/RET RECEIVED FROM UNREGISTERED ENTITY
17Y REF/REB/RET FROM INDIVIDUAL/CORPORATION
17Z REF/REB/RET FROM CANDIDATE/COMMITTEE
18G TRANSFER IN AFFILIATED
18H HONORARIUM RECEIVED
18J MEMO (FILER'S \% OF CONTRIBUTION GIVEN TO JOIN
18K CONTRIBUTION RECEIVED FROM REGISTERED FILER
18S RECEIPTS FROM SECRETARY OF STATE
18U CONTRIBUTION RECEIVED FROM UNREGISTERED COMMI
19 ELECTIONEERING COMMUNICATION DONATION RECEIVE
19J MEMO (ELECTIONEERING COMMUNICATION \% OF DONAT
20 DISBURSEMENT - EXEMPT FROM LIMITS
20A NON-FEDERAL DISBURSEMENT LEVIN (L-4A) VOTER R
20B NON-FEDERAL DISBURSEMENT LEVIN (L-4B) VOTER I
20C LOAN REPAYMENTS MADE TO CANDIDATE
20D NON-FEDERAL DISBURSEMENT LEVIN (L-4D) GENERIC
20F LOAN REPAYMENTS MADE TO BANKS
20G LOAN REPAYMENTS MADE TO INDIVIDUAL
20R LOAN REPAYMENTS MADE TO REGISTERED FILER
20V NON-FEDERAL DISBURSEMENT LEVIN (L-4C) GET OUT
22G LOAN TO INDIVIDUAL
22H LOAN TO CANDIDATE/COMMITTEE
22J LOAN REPAYMENT TO INDIVIDUAL
22K LOAN REPAYMENT TO CANDIDATE/COMMITTEE
22L LOAN REPAYMENT TO BANK
22R CONTRIBUTION REFUND TO UNREGISTERED ENTITY

22U LOAN REPAYED TO UNREGISTERED ENTITY
 22X LOAN MADE TO UNREGISTERED ENTITY
 22Y CONTRIBUTION REFUND TO INDIVIDUAL
 22Z CONTRIBUTION REFUND TO CANDIDATE/COMMITTEE
 23Y INAUGURAL DONATION REFUND
 24A INDEPENDENT EXPENDITURE AGAINST
 24C COORDINATED EXPENDITURE
 24E INDEPENDENT EXPENDITURE FOR
 24F COMMUNICATION COST FOR CANDIDATE (C7)
 24G TRANSFER OUT AFFILIATED
 24H HONORARIUM TO CANDIDATE
 24I EARMARKED INTERMEDIARY OUT
 24K CONTRIBUTION MADE TO NON-AFFILIATED
 24N COMMUNICATION COST AGAINST CANDIDATE (C7)
 24P CONTRIBUTION MADE TO POSSIBLE CANDIDATE
 24R ELECTION RECOUNT DISBURSEMENT
 24T EARMARKED INTERMEDIARY TREASURY OUT
 24U CONTRIBUTION MADE TO UNREGISTERED
 24Z IN-KIND CONTRIBUTION MADE TO REGISTERED FILER
 29 ELECTIONEERING COMMUNICATION DISBURSEMENT(S)

NON-FEC CODES

15S CONTRIBUTION TO STATE ELECTIONS (CATCHALL)
 15L CONTRIBUTION TO LOCAL ELECTIONS (CATCHALL)
 15PD CONTRIBUTION MADE AS PAYROLL DEDUCTION
 PF PUBLIC FUNDING (STATE LEVEL)
 PFR PUBLIC FUNDING RETURNED (STATE LEVEL)

9 Improvements to Scaling Algorithm

9.1 Adjusted CFscores scores

During the 42-year period covered by DIME, the campaign finance landscape has changed dramatically. The volume of contributions per election cycle has increased from a few hundred thousand itemized contributions per election cycle in the 1980s to over two-hundred million itemized contributions in the 2020 election cycle alone. This represents more than 1000-fold increase in data volume. This increase occurred alongside the rise of online giving and increasingly sophisticated fundraising operations, which has skewed the information entering the model towards more recent election cycles.

To account for these developments, the DIME CFscore model has been adjusted. It does so by taking advantage of candidates continuing across election cycles. First, period-specific ideal point are estimated for candidates, while holding the contributor ideal points constant. This yields a vector of ideal points, Y_{it} , for candidate i in cycle t . The vector of cycle-specific ideal points is regressed on fixed effects for cycle and candidate, controlling for incumbency, seat competitiveness, and percentage of contributions raised online through conduits, such as ActBlue and WinRed. The regression equation is:

$$Y_{it} = cand_i + cycle_t + incumbent_{it} + competitive_seat_{it} + pct_conduit_{it},$$

weighted by:

$$\omega_{it} = \frac{\ln(num_donations_{it})}{\ln(num_donations_i)} \times \ln(num_donations_i).$$

The adjusted candidate CFscores are set equal the fitted values for candidate fixed effects, $cand_i$. The regression is estimated separately for each party.

10 State-to-Federal Bridging

The state-to-federal bridging algorithm now applies a supervised machine learning similar to that developed in Bonica (2018). For each state, the contributor matrix is subset donors who have given to state-level candidates in that state and federal candidates at large. A random forest model is trained to predict the candidate scores recovered from federal elections. Score for state-level candidates are then imputed based on their donors who have also given to federal elections. The imputed scores are limited to state-level candidates with at least 15 donors who had also given to federal candidates. The scores for state-level candidates that do not meet the threshold are recovered using the bridging algorithm outlined in Bonica (2014). A key difference is that scores for state-level candidates that have been imputed via random forest are now treated as fixed values, similar to federal candidates, by the bridging algorithm.

11 Notes on Data Usage

Although I strive for completeness and accuracy in compiling the database, it is not guaranteed to be 100% comprehensive or without error. The donor and candidate IDs were assigned using a automated entity resolution framework that relies on probabilistic record-linkage algorithms. Researchers interested in collecting contribution records for a specific group of donors are encouraged to hand-check the IDs assigned by the identity resolution algorithm to screen for possible errors. Corrections are welcome.

Duplicate contribution records are also known to occur in the database. This is often due to cross-reporting by one or more agency. For example, contributions to federal-connected 527s will at times

be reported by the FEC under the transaction code 19. Contributions given through conduits also appear the FEC data twice with different recipients listed. The current release includes a column named `bk.ref.transaction.id` to aid in removing duplicated records.

Note also that estimated ideal points for candidates and contributors are based on varying amounts of data. For easy reference, the contributor and candidate/recipient files include columns indicating the number of contribution observations that were used to calculate each score. These files also indicate which donors/recipient were included in the scaling. In many cases, a donor may have only contributed to a single recipient and thus was excluded when estimating the ideal point model. Researchers should take this into account when deciding which donors to include in a study and may consider defining a minimum threshold for the number of contributions required for inclusion.

12 Tips for Working with Large Data Files

Due to the size of the contribution files, working with a statistical software package such as R is often necessary. The delimited CSV files will load into most spreadsheet oriented applications but will usually be truncated due to software limitations files with more than 1 million rows. Even when using a statistical software package, some of the contribution files from more recent election cycles can run up against memory limits on machines with less than 16GB of memory. Fortunately, there are several workarounds for accessing the data from disk or using publicly available cloud-based applications. One approach that has worked well is to import the CSV files into a SQLite database. This can be done within R using the RSQLite package. Alternatively, there are several freely available SQLite applications with built-in support for working with large CSV files. Another user-friendly approach is Google Fusion Tables, a cloud-based platform designed for working with large data files. Google provides the service free-of-charge and provides detailed documentation for getting started and taking advantage of its more advanced features.

13 Reverse Compatibility With Earlier Releases

The database has undergone substantial changes and revisions from the original release. Improvements and other modifications were made to the identity resolution algorithms to take advantage of addition information and increased computational resources. The `BONICA.CID` values for individual records may differ between releases. The `TRANSACTION.ID` has remained unchanged and can be used as a crosswalk for tracking changes in *bonica.cid* values since the original release of the database.

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Some of the variables included in the contribution database are provided by the Center for Responsive Politics (<http://www.opensecrets.org>) and the National Institute for Money in State Politics (<http://www.followthemoney.org>). These variables are indicated by placing the strings (CRP) or (NIMSP) before the variable name. If any of these variables are used, please attribute credit accord-

ingly.