

Using Compustat Security Market Data as the Data Source for Eventus

Overview

The Compustat North America, Compustat Global ex-North America and combined Compustat Global databases include historical equity-security trading data including daily and monthly prices and other items. Eventus now supports using the Compustat security data as the input database without manual pre-extraction and assembly of data. You must have access to one or more Compustat databases, normally through an institutional subscription, typically for usage via WRDS.¹ The native Compustat data do not include rate of return series, so Eventus must calculate returns. Calculated returns are stored for use by subsequent jobs.

Usage

Using Compustat with Eventus is mostly similar to using the default data source, CRSP². The main differences are that you identify each equity issue in your request file by a GKVEY and an IID instead of either a PERMNO or a CUSIP, and you use Compustat-specific options, described below, to make certain data selections. Usage examples appear later in this document.

Eventus Statement Options

All Compustat-related options go on the Eventus statement. They are not case-sensitive. You may place them anywhere between the word Eventus and the semicolon (;) that ends the statement; the order does not matter. The number of blank spaces between options does not matter other than a minimum of one space. If an option takes an argument, do not put any space character around the equal sign. In the documentation, the symbol | separates options in a list to show that at most one is used at a time. If an option takes an argument, do not put any space character around the equal sign. When an italicized *argument* appears, you replace the italicized placeholder with your own argument. Options are not case-sensitive.

Options for Both WRDS (Including Remote Submit) and Non-WRDS Users

All options in Eventus, except those that refer to specific CRSP databases, variables unique to CRSP, or user-built non-CRSP input data sets, can be used in Compustat mode, or in a few cases documented below, have Compustat-specific equivalents.

¹ WRDS is Wharton Research Data Services, a subscription-based service of the University of Pennsylvania. Eventus is a third-party product hosted by WRDS, not part of WRDS, and also available as a standalone Windows software application. Eventus licensed software is offered by Cowan Research, L.C., an independent company.

² Database produced and licensed by the Center for Research in Security Prices, University of Chicago Booth School of Business.

Compustat

The Compustat option selects the use of Compustat securities data, i.e. it invokes Compustat mode. The options below work only in Compustat mode.

CSTEqual

In Compustat mode, the default market index for each security is a country-matched value-weighted index. To switch to a country-matched equal-weighted index, use the CSTEqual option. The method of switching index weighting differs from the method used with CRSP and user-built non-CRSP data sets, where EvtStudy statement options (Value, Equal, Both) are used.

CSTVolume | CSTVolume=NoLogTrans

To run a volume (share turnover) event study, use the CSTVolume option. This is a different method of selecting a volume event study from the method used with CRSP and other non-CRSP databases. Except with Compustat, you use the EvtStudy statement option Volume to run a volume event study. That option has no effect in Compustat mode.

Eventus uses log-transformed relative volume in volume event studies. To use non-log-transformed relative volume in a Compustat volume event study, add the argument =NoLogTrans to CSTVolume. Except with Compustat, you use the EvtStudy statement option NoLogTrans (with the Volume option) for this purpose, but with Compustat you must use the Eventus statement option CSTVolume=NoLogTrans.

CSTNoPriceVol

The CSTNoPriceVol option has an effect only when Eventus is building new data sets from native Compustat data as discussed under Details below. If you plan to run only rate of return event studies, and do not need market capitalization data for the ValueWeightSample option, you can use the CSTNoPriceVol option to reduce the size of the support data sets being built by omitting price per share, number of shares and trading volume.

GLXNA | NORAM

The GLXNA and NORAM options can be useful if you have access to both Compustat North America (covering U.S. and Canadian markets) and Compustat Global ex-North America as separate databases. (WRDS delivers the two separately. Elsewhere, they could be either separate or merged into a single global database.) If your institution subscribes to only Compustat Global ex-North America or only Compustat North America, or if you have both regions in a single non-WRDS combined Compustat Global database, then these two options are not applicable.

GLXNA restricts the query to Compustat Global ex-North America only; NORAM restricts the query to Compustat North America only. If neither option is present, or if both are, then both regions will be queried if available.

If you know that the stocks in your request file (identified by GVKEYs and IIDs) are all in the North America database, or that all of them are in the Global ex-North America database, using the respective option can speed up your job by avoiding an unnecessary search of the other regional database.

CSTBuild | CSTUpdate

CSTBuild causes Eventus to build new return data sets from the current native Compustat data sets. Any existing return data sets are erased first. CSTUpdate causes Eventus to compare the date of any existing return data sets to the date of the current native Compustat data sets. If the native Compustat data sets are newer, or if no return data sets are found, then Eventus builds new return data sets after deleting any existing return data sets. With CSTBuild or CSTUpdate, after building the return data sets, or determining that the existing return data sets are up to date in the case of CSTUpdate, Eventus terminates. If Request, Windows and EvtStudy are submitted together with the Eventus statement, they are not processed; you have to run them as part of a job with no CSTBuild or CSTUpdate option.

If you use neither CSTBuild nor CSTUpdate, Eventus uses the existing return data sets if found, or builds return data sets from the current native Compustat data sets otherwise, before proceeding to process the accompanying Request, Windows and EvtStudy statements.

The CSTBuild statement is especially recommended if the job is run by remote submit from PC SAS to WRDS and no Eventus Compustat support data sets already exist (for example, upon the first use of Eventus Compustat mode at an institution). The reason for this recommendation is that building the data sets takes several minutes, during which the messaging conversation between PC SAS and WRDS often breaks down even though the underlying processing is successful. In other words, if you try to run an event study via remote submit without existing return data sets, Eventus builds the data sets properly, but while it is doing so, the SAS/Connect link between PC SAS and WRDS SAS times out. This does not affect the data-set building process, but Eventus running on WRDS becomes unable to communicate with PC SAS to tell you that it built the data sets or to return the event-study results. This issue does not occur when you run Eventus using the `qsas` command from the WRDS Cloud command line nor when you use our Eventus for Windows product (where WRDS SAS is not involved).

Options Primarily for Non-WRDS Users

WRDS users normally do not need these options because Eventus automatically uses the appropriate settings when running on WRDS.

CSTLib= *libref*

CSTLib2= *libref2*

The **CSTLib=** option allows you to specify the SAS library name (*libref*) for the library (folder or directory) in which the Compustat database (in SAS data set form) is stored. If the option is not

used, Eventus expects to find Compustat under libref COMP on WRDS or COMPUDAT in Windows. If you have separate Compustat North America and Compustat Global ex-North America databases in different SAS libraries, use the CSTLib2= option to specify the libref for the library that contains the Global ex-North America datasets.

CST2Prefix=*prefix*

If you have separate Compustat North America and Compustat Global ex-North America databases in the same SAS library, the Global data sets must be distinguished by a two-character prefix. The first character of the prefix must be a letter or underscore and the second must be a digit, letter, or underscore. Use the CST2Prefix option to specify the prefix if applicable.

CSTSupLib=*libref*

Use this option to specify a non-default SAS library name (libref) for the location in which Eventus is to build return and index data sets from native Compustat data, or in which previously built data sets exist. On WRDS, the default location for the data sets is your institution's shared scratch space, as explained further under Details. In Eventus for Windows, CSTSupLib defaults to EvData, the SAS libref pointing to the folder used for various Eventus support data sets.

Details

In Compustat mode, Eventus builds new return data sets if none exist in the default location or the CSTSupLib= location if the option is used, if you use the CSTBuild option, or if you use the CSTUpdate option and the return data sets are outdated relative to the native Compustat data sets. Building return data sets takes several minutes to potentially over an hour depending on the speed of the system being used; 10-20 minutes is typical on WRDS. Eventus saves the return data sets in the default location or in the location to which the CSTSupLib= option points and uses them for subsequent runs.

The return data sets require up to 35 GB of storage for the full Compustat Global including North America or 15-20 GB for Compustat North America or Compustat Global ex-North America alone. After creation, you may leave the data sets where they are, or move them to a new location and set the CSTSupLib= option to point to the new location the next time you use them.

On WRDS, the default location is your institution's shared scratch space, e.g. /scratch/iastate. The return data sets that Eventus builds consist of several files that have names starting with Eventus_cst. All users at the institution have access to the data sets, potentially including the ability to update them. If the data sets go unused for seven days, they will be automatically deleted according to WRDS policy at the time of this writing.

Eventus synchronizes daily security returns for non-U.S. markets to the New York Stock Exchange calendar in order to tie event-time alignment in multi-country samples more closely to calendar

time. No synchronization is needed for monthly data, because all markets are open the same calendar months. Key cases of the procedure for handling a non-U.S.-listed issue’s daily returns appear in the table, where “tomorrow” refers to weeks consisting only of Monday

Is the Listing Market Open Yesterday/Today?	Is the NYSE Open Yesterday/Today/Tomorrow?	When and How is Today’s Listing-Market Return Reported Using NYSE Dates?
Either/Yes	Either/Yes/Either	Today, as a single day return.
Yes/Yes	Either/No/Yes	Tomorrow, compounded with tomorrow’s listing-market return if any.
Yes/Yes	Either/No/No	After tomorrow, compounded with any listing-market returns for days from tomorrow to the reporting day, inclusive.
No/Yes	Yes/No/Either	Yesterday, as a single day return.

through Friday, which are the only days the NYSE can be open in the years covered by Compustat securities data. For example, for a “today” Friday, tomorrow means the following Monday. Returns are computed in the trading currency; no adjustment for currency exchange rates is applied to prices or returns. In a small fraction of Compustat security-data observations, we have found the currency of a cash distribution (Compustat data item curcdd) to be different from the currency of the issue’s price (Compustat data item curcddv) as of the ex-dividend date. For example, some dividends having an ex-date not long after the euro replaced a national currency are reported in the former national currency. For return computation, Eventus resolves dividend-versus-price currency discrepancies by converting the dividend to the currency of the price. The exchange rate used is the official fixed euro conversion rate from the former national currency (see <https://www.ecb.europa.eu>) when applicable, and otherwise is the daily exchange rate from Compustat table exrt.

Each company, identified by a GVKEY, has only one primary issue at a time, identified by an IID, in the Compustat security data. Some companies change their primary issue over time, in which case the database reports change dates. We assume that the first primary issue ever reported for a GVKEY applies starting on the first trading day ever reported for the firm, and that the last primary issue reported continues to be primary until the firm is delisted or the end of the database period is reached.

Eventus builds an equal-weighted and a value-weighted index return series for each country as identified by Compustat data item excntry. The equal-weighted series for a given excntry value includes all issues having that excntry value in the Compustat table named security. The corresponding value-weighted series includes only issues that are primary on the date of the return as identified by Compustat table sec_history. The different inclusion criteria for value-weighted versus equal-weighted indexes used by Eventus in building Compustat-based return indexes follow CRSP’s including all issues in equal-weighted indexes but excluding ADRs from value-weighted indexes.

Value-weighted indexes are weighted by market capitalization (cap) at the beginning of the return period; e.g. a return for trading day t is weighted by the closing market cap on day t-1 and a September return is weighted by the August closing market cap in the same year.

Because of differences in historical market development and Compustat coverage, some countries do not have index returns for the full database era. Also, some countries may have non-missing equal-weighted index returns but missing value-weighted index returns in some periods due to the different inclusion requirements discussed above.

The formulas that Eventus uses to calculate variables for the output data sets are as follows. The variable names prccd, div, cheqv, ajexdi, cshtrd and chsoc are the Compustat data item names under which the quantities are found in Compustat tables sec_divid and sec_dprc. The remaining variables are computed by Eventus.

Rate of return of security j on day t:

$$ret_{jt} = [(prccd_{jt} + div_{jt} + cheqv_{jt}) \div ajexdi_{jt}] \div (prccd_{jt-1} \div ajexdi_{jt-1}) - 1$$

Rate of return of security j in month m:

$$ret_{jm} = \prod_{t=1}^{t_m} (1 + ret_{jt}) - 1 \text{ where } t_m \text{ is the last trading day of month } m$$

Relative volume (before log transformation) of security j on day t:

$$relvol_{jt} = cshtrd_{jt} \div chsoc_{jt}$$

Relative volume (before log transformation) of security j in month m:

$$relvol_{jm} = \frac{\sum_{t=1}^{t_m} cshtrd_{jt}}{chsoc_{jm}} \text{ where } t_m \text{ is the last trading day of month } m \text{ and } chsoc_{jm} \text{ is the last non-missing value of } chsoc \text{ reported in month } m$$

Market capitalization of security j at the end of day t:

$$mv_{jt} = prccd_{jt} \times chsoc_{jt}$$

Market capitalization of security j at the end of month m:

$$mv_{jt_m} \text{ where } t_m \text{ is the last trading day of month } m$$

Equal-weighted market index return for country h for period t, where n_{ht} is the number of securities in country h with non-missing returns for period t:

$$dewr_{ht} = \frac{1}{n_h} \sum_{j=1}^{n_{ht}} ret_{jt}$$

Value-weighted market index return for country h for period t, where n_{ht} is the number of securities in country h with non-missing returns for period t:

$$dvwr_{ht} = \left(\sum_{j=1}^{n_{ht}} mv_{jt-1} \times ret_{jt} \right) \div \sum_{j=1}^{n_{ht}} mv_{jt-1}$$

Examples

PC SAS Remote Submit to WRDS Examples

For further information on the remote submit process, please see <https://support.eventus-study.com/hc/en-us/articles/212258923-Eventus-on-WRDS-through-PC-SAS>, documentation on the WRDS website and the SAS/Connect documentation.

Build Returns and Store for Use in Subsequent Jobs

```
/* We suggest running the lines of this example all at once. */
/* This program builds returns from native Compustat data and stores the */
/* returns for use by subsequent Eventus jobs. */
options ps=60 ls=120; /* Page and line size on PC side. */
options nomstored noimplmac; run; /* A precaution against certain conflicts. */
%let wrds = wrds.wharton.upenn.edu 4016;
options comamid=TCP remote=WRDS;
signon cstatus=no username=_prompt_;
rsubmit;
options ps=60 ls=120; run;
Eventus Compustat CSTBuild;
endrsubmit;
signoff;
options mstored implmac; run;
/* The return building job usually takes about 15 minutes for combined */
/* Compustat North America and Compustat Global ex-North America. Check */
/* the status of your job by signing into the WRDS website, clicking on */
/* your account in the upper right, and selecting Running Queries. You */
/* refresh the page as desired to update the display. When your job no */
/* longer shows up under PC-SAS Jobs, it's done. PC SAS may still show */
/* that remote processing is in progress. If so, you can click on the */
/* Break icon (!) and select the first option to regain control. The */
/* SAS log may show a communication-related error message, but it does */
/* not mean anything went wrong. The communication channel between PC */
/* SAS and WRDS tends to close when a job runs for an unusually long */
/* time as this one can. */
```

Run an Event Study Using Daily Data and Store CARs on the PC

```
/* We suggest running the lines of this example all at once. */

/* This program builds a request file in PC SAS, runs a */
/* return event study using Compustat data on WRDS. and */
/* stores cumulative abnormal returns (CARs) in a SAS */
/* data set in the Work library of PC SAS. */

/* Use any method of creating a SAS data set that you */
/* know. You do not have to do it this way. Eventus also*/
/* can accept a simple text request file formatted like */
/* the input lines below; point to it with a filename */
/* request statement and omit insas= from the code. */
data request;
  infile datalines expandtabs;
  input gvkey:$6. iid:$3. eventdate:yymmdd8.;
  format eventdate yymmddn8.; /* Optional, for human readability of data set. */
datalines;
006066      01      19880418
012141      01      20110830
232070      01W     20100329
216026      01W     20070430
211838      01W     20051216
213491      01W     20000920
282118      01W     20110301
226830      01W     20000320
run;

options ps=60 ls=120; /* Page and line size on PC side */
options nomstored noimplmac; run; /* A precaution against certain conflicts. */

%let wrds = wrds.wharton.upenn.edu 4016;
options comamid=TCP remote=WRDS;
signon cstatus=no username=_prompt_;

rsubmit inheritlib=(work=pcwork);
options ps=60 ls=120; /* Page and line size on WRDS side */

Eventus Compustat;
  title 'Eventus Compustat Demo';
  Request InSAS=pcwork.request AutoDate;
  Windows (-30,-2) (-1,0) (0,0) (0,1) (-1,+1) (-2,+2) (2,30);
  EvtStudy median outwin=announce_cars;

proc download data=announce_cars out=announce_cars; run;

endrsubmit;

signoff;
options mstored implmac; run;
```

WRDS Cloud Command Line (“Shell”) Examples

For more information about running SAS (including Eventus), please see the WRDS Cloud documentation on the WRDS website. It is not necessary to run a separate return building job. If no return data sets are found, Eventus will build them before continuing with the event study.

Run an Event Study Using Daily Data and Store CARs in a File

```
/* We suggest running the lines of this example all at once. */

/* This program builds a request file in PC SAS, runs a */
/* return event study using Compustat data on WRDS. and */
/* stores cumulative abnormal returns (CARs) in your */
/* preferred file type for use in subsequent analysis */
/* on WRDS or downloading to your PC. */

libname myhomdir '~'; /* Defines a SAS pointer to your home folder. */

/* Use any method of creating a SAS data set that you */
/* know. You do not have to do it this way. Eventus also*/
/* can accept a simple text request file formatted like */
/* the input lines below; point to it with a filename */
/* request statement and omit insas= from the code. */
data request;
  infile datalines expandtabs;
  input gvkey:$6. iid:$3. eventdate:yymmdd8.;
  format eventdate yymmddn8.; /* Optional, for human readability of data set. */
datalines;
006066      01      19880418
012141      01      20110830
232070      01W     20100329
216026      01W     20070430
211838      01W     20051216
213491      01W     20000920
282118      01W     20110301
226830      01W     20000320
run;

Eventus Compustat;
title 'Eventus Compustat Demo';
Request InSAS=request AutoDate;
Windows (-30,-2) (-1,0) (0,0) (0,1) (-1,+1) (-2,+2) (2,30);
EvtStudy median
/* The following lines select CSV, Stata and SAS data set output file */
/* formats respectively. You can get all three or delete the line(s) */
/* for the format(s) you don't need. Replace announce_cars with your */
/* preferred file or data set name. */
CSVwin=%quote(announce_cars.csv) /* CSV file */
DTAWin=%quote(announce_cars.dta) /* Stat file */
OutWin= myhomdir.announce_cars /* SAS data set */
; /* Semicolon to terminate the EvtStudy statement. */
```

This document was last updated September 25, 2019.