



IT Notes

31 October 2020

Contents

1	Purpose	3
2	Application <i>SST Dashboard</i>	3
2.1	System requirements	3
2.2	Installation	3
3	R package <i>sstCalculation</i>	5
3.1	System requirements	6
3.1.1	Required software programs	6
3.1.2	Required R packages	6
3.2	Installation	7
4	Run the Dashboard	9

1 Purpose

This document is a guide for the installation of the application *SST Dashboard* and the R package *sstCalculation*.

The application *SST-Dashboard* and the R-package *sstCalculation*, which were tested as part of the Credit Risk and SST Tool field test, replace the previous application *SST-Tool* and the R-package *sstModel*.

2 Application *SST Dashboard*

The *SST Dashboard* is a standalone application that allows computing the SST ratio using an executable Windows program. It contains the following programs:

1. The R package *sstCalculation*,
2. The R programs and packages necessary for the R package *sstCalculation*,
3. A portable Chromium webbrowser,
4. A program for the automatic installation on a Windows computer.

2.1 System requirements

An Intel-compatible machine, with at least 4GB RAM. However, 8GB are recommended.

The executable setup is distributed in two different versions:

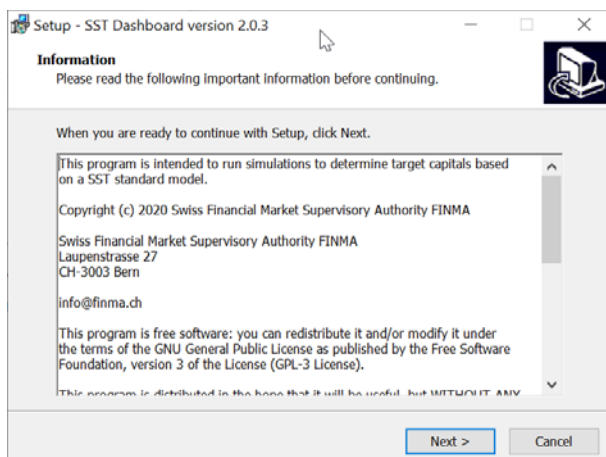
File	Windows Versions
SST_Dashboard_setup_x86.exe	32 bit
SST_Dashboard_setup_x64.exe	64 bit

Both versions do not require any external libraries or programs to run properly, with the exception of the Windows system libraries. They are compatible and have been tested with Windows 7, Windows 8.1 and Windows 10. The executable version may also run on other versions of Windows. However, it has been tested only for the listed versions.

2.2 Installation

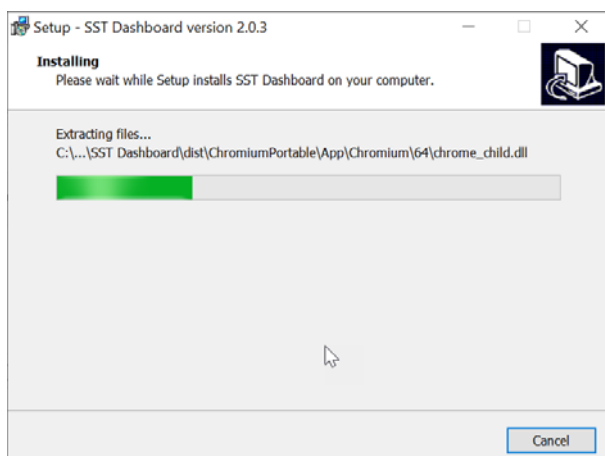
Step 1

Download the fitting executable version from the SST website and open it. Read the legal notices and then click *Next*.



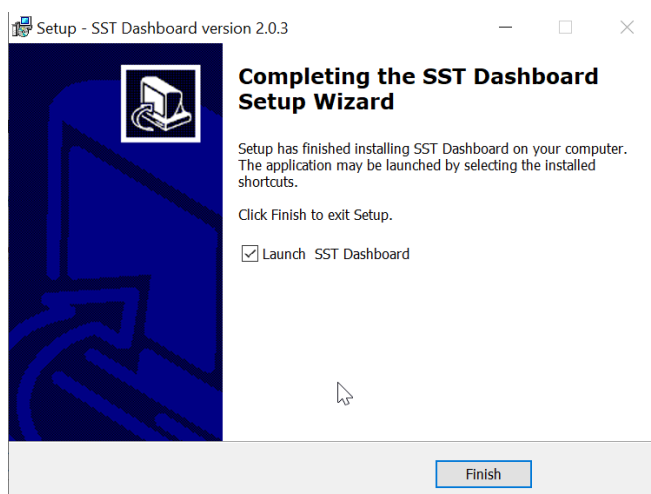
Step 2

Wait for the installation to be completed. This will take approximately 5 minutes.



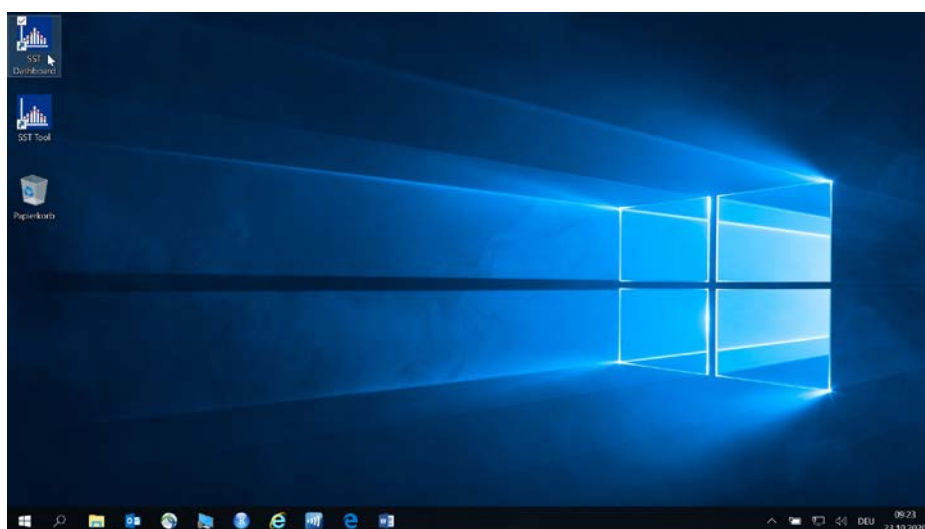
Step 3

Click on *Finish* to finalize the installation.



Step 4

After the installation, you will find a *shortcut* of the SST Dashboard on the desktop. Double-click on this *shortcut* to start the dashboard.



3 R package *sstCalculation*

The R package *sstCalculation* for the calculation of the SST Ratio consists of the following programs:

1. the standalone R package *sstCalculation* itself
2. a GUI *Dashboard* started by a web browser.

The R package *sstCalculation* requires the programs R, RTools and Rstudio as well as other R packages.

Note that the system requirements are identical to those of the former R package *sstModel*.

3.1 System requirements

An Intel-compatible machine, with at least 4GB RAM. However, 8GB are recommended.

The *sstCalculation* R package is compatible and has been tested with Windows 7, Windows 8.1 and Windows 10. The *sstCalculation* R-package can also run on other Unix based operating systems supported by R. However, it has been designed only for the listed Windows versions.

3.1.1 Required software programs

The following software programs need to be pre-installed on the user's machine.

Software name	Minimum version
R	3.3.0
Rtools	3.4
RStudio	1.0.136

Remark: RStudio is necessary for launching the GUI.

3.1.2 Required R packages

The *sstCalculation* R package requires the following R packages to be installed in the user's R package library. Package names in *italics* are pre-installed within R.

Package name	Minimum version
<i>data.table</i>	1.10.4-3
<i>readxl</i>	1.0.0
<i>openxlsx</i>	4.0.17
<i>MASS</i>	None
<i>shiny</i>	1.0.5
<i>shinydashboard</i>	0.6.1
<i>cellranger</i>	None
<i>Rcpp</i>	0.11.6
<i>tibble</i>	1.1
<i>httpuv</i>	1.3.5
<i>mime</i>	0.3
<i>jsonlite</i>	0.9.16
<i>xtable</i>	None
<i>digest</i>	None
<i>htmltools</i>	0.3.5

R6	2.0
sourcetools	None
rematch	None
cli	None
crayon	None
pillar	None
rlang	None
assertthat	None
utf8	1.1.3
stats	-
utils	-
tools	-
methods	-
grDevices	-
graphics	-

3.2 Installation

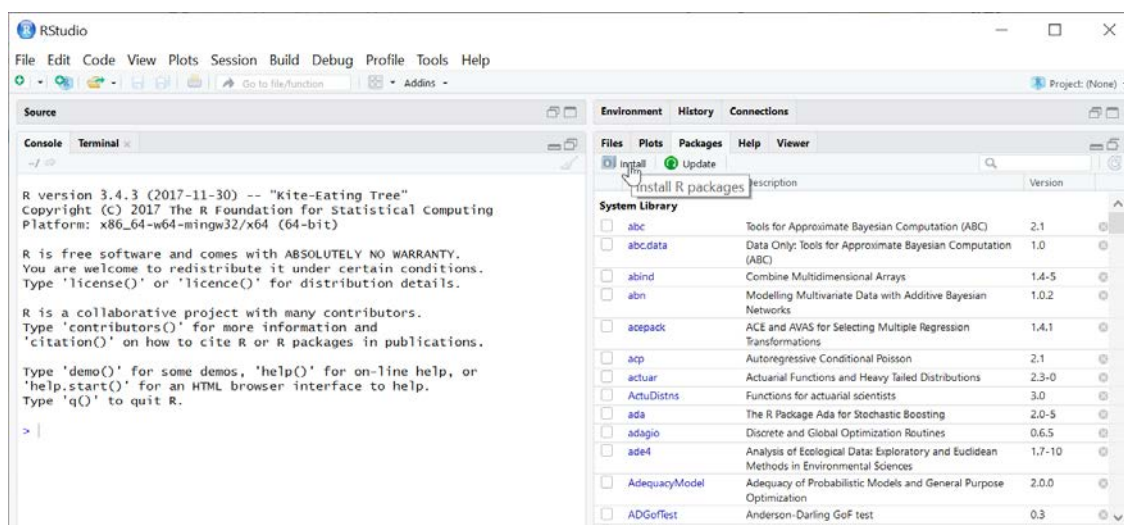
Above software programs and R packages have to be installed before the installation of the R package *sstCalculation*.

Step 1

Store the R package *sstCalculation_2.0.3.tar.gz* on the local drive.

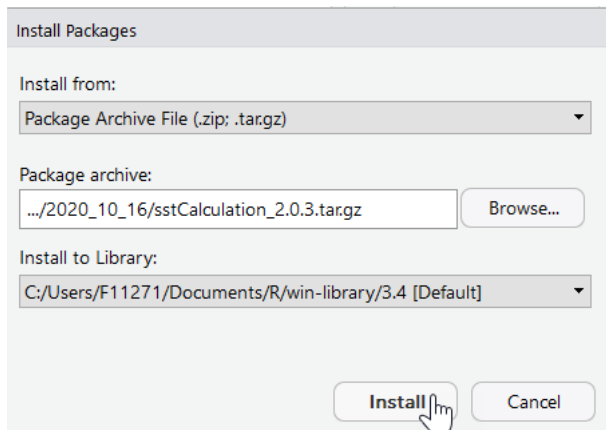
Step 2

Start RStudio. Select the tab *Packages* on the right and click on *Install*. A dialog box opens.



Step 3

Click on *Browse*, search for the R package *sstCalculation_2.0.3.tar.gz* and click *Install* in the dialog box.



Step 4

Wait a moment. This feedback is displayed in the console down left.

```
> install.packages("~/Marktrisiko_BVG_Implementierung/neues SST Tool/2020_10_16/sstCalculation_2.0.3.tar.gz", repos = NULL, type = "source")
Installing package into 'C:/Users/F11271/Documents/R/win-library/3.4'
(as 'lib' is unspecified)
* installing *source* package 'sstCalculation' ...
** R
** inst
** preparing package for lazy loading
** help
*** installing help indices
    converting help for package 'sstCalculation'
      finding HTML links ... fertig
      excelToModelSST                html
      sstCalculation-package          html
      sstCalculation                  html
      sstDashboard                    html
      sstIntroduction                  html
      sstNews                          html
** building package indices
** installing vignettes
** testing if installed package can be loaded
* DONE (sstCalculation)
In R CMD INSTALL
> |
```

The installation is completed successfully, when everything is displayed in black. Otherwise, for system requirements please refer to above chapter.

Step 5

Enter the command `library(sstCalculation)` into the console to load the package. The GUI is started via the command `sstDashboard()`.


```

> library(sstCalculation)
sstCalculation 2.0.3

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This program comes with ABSOLUTELY NO WARRANTY.
This is free software, and you are welcome to redistribute it
under certain conditions.

Type sstDashboard() and go to the 'Legal Notices' Tab for more details about the license.
Type sstIntroduction() to open an introduction to the sstCalculation package.
Type sstNews() to open an overview of the changes to the sstCalculation package.

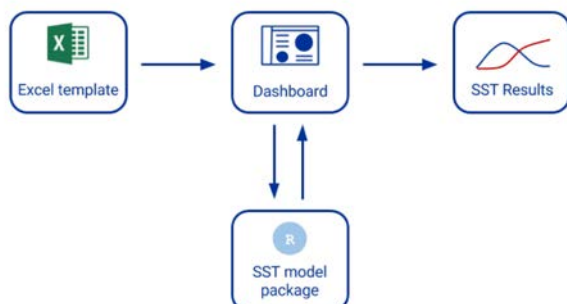
> sstDashboard()
The results will be exported to the following directory: C:\Users\F11271\Documents
Loading required package: shiny

```

The results are exported to the folder *Documents* by default. A different folder can be defined, see *?sstDashboard*.

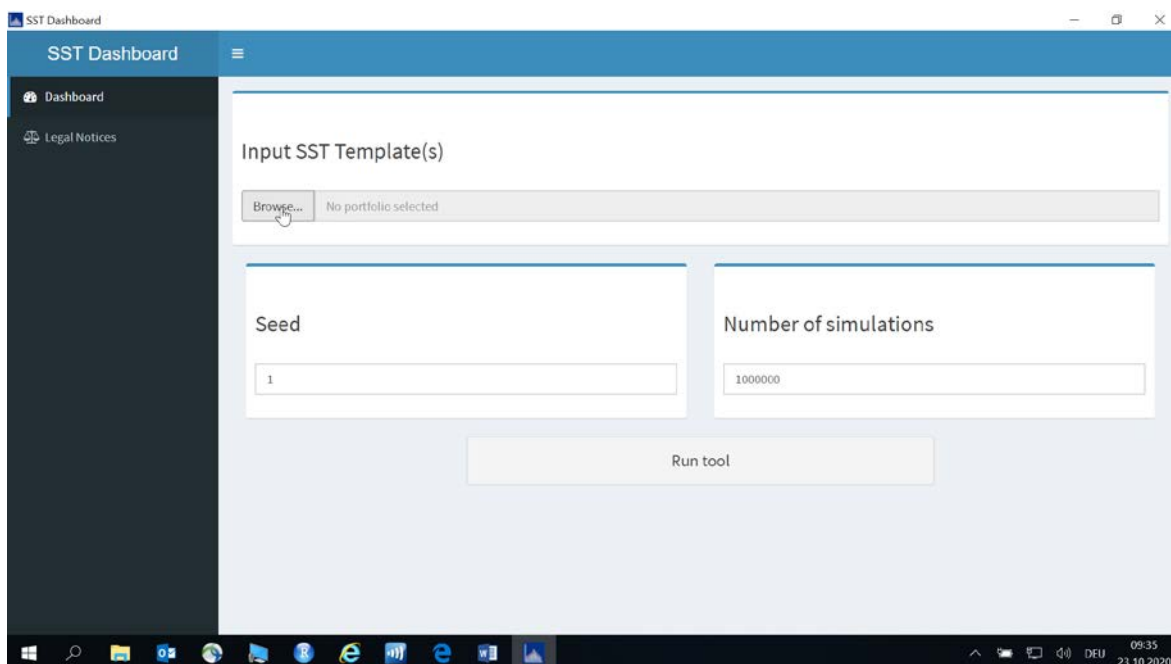
4 Run the Dashboard

The following picture shows the exchange between excel template, dashboard and R package.



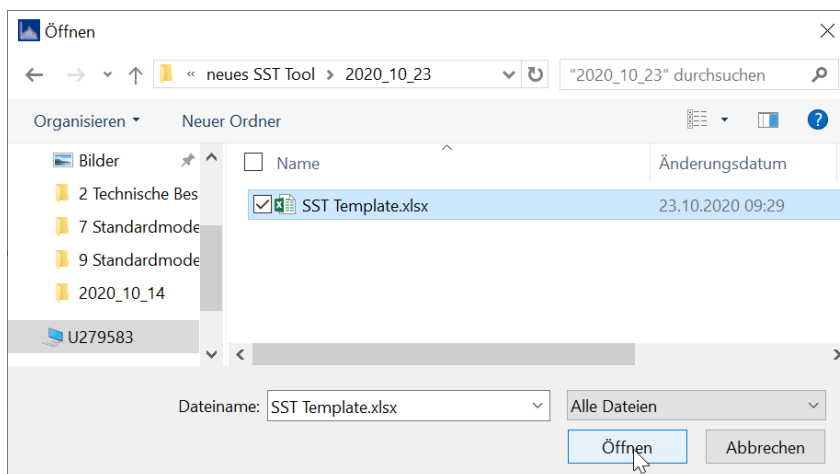
Step 1

The SST-Dashboard is started and a browser opens with the dashboard. Click on Legal Notices for the legal notices related to the use and transfer of the package.



Step 2

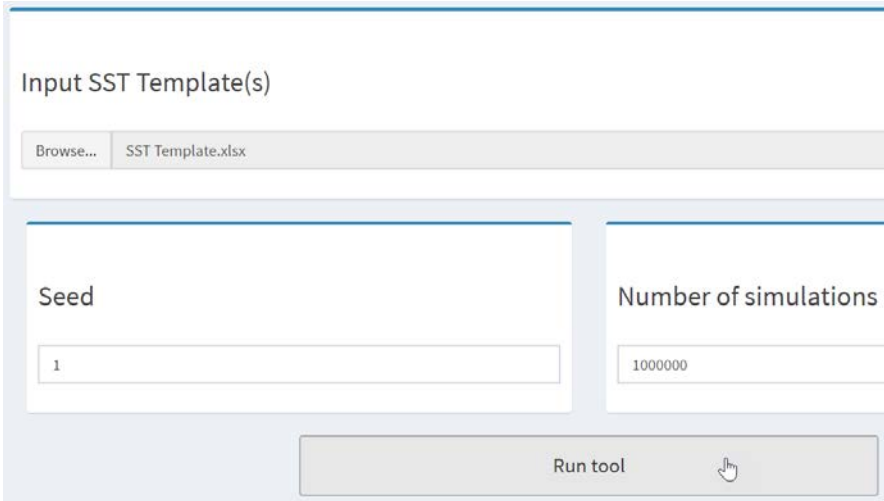
Upload the filled *SST Template*.



Users of the standard model for participations select all needed *SST Templates_CR*.

Step 3

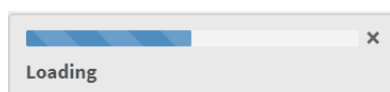
Seed and number of simulations are loaded from the *SST Template*. Number of simulations for solvency calculation purposes should be 1 million usually. Click on *Run tool* to start the SST calculation.



The screenshot shows a web-based interface for the SST tool. At the top, there is a section titled "Input SST Template(s)" with a "Browse..." button and a file name "SST Template.xlsx". Below this, there are two input fields: "Seed" with the value "1" and "Number of simulations" with the value "1000000". At the bottom, there is a large "Run tool" button with a mouse cursor icon over it.

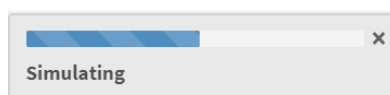
Step 4

The *SST Template_CR* is parsed. Specific error messages are displayed in case any inputs are incomplete or incorrect.



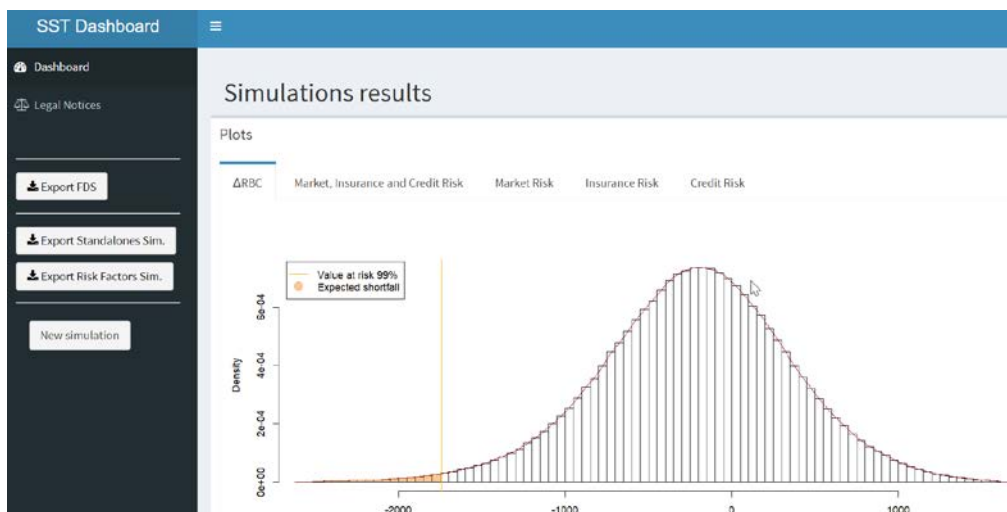
Step 5

The simulations for the calculation of the SST ratio are generated. This step can take a few minutes.



Step 6

Once the simulations are generated and the results for the *Fundamental Data Sheet* are calculated, a graphic is displayed on the screen showing the most important results and marginal distribution functions.



Step 7

Click on the box *Export FDS* to download the results for the *Fundamental Data Sheet*.



Step 8

An excel file *Fundamental_Data.xlsx* containing the results is downloaded.