Package ‘ggsolvencyii’

January 4, 2019

Title  A 'ggplot2'-Plot of Composition of Solvency II SCR: SF and IM
Version  0.1.2
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Description  An implementation of 'ggplot2'-methods to present the composition of Solvency II Solvency Capital Requirement (SCR) as a series of concentric circle-parts. Solvency II (Solvency 2) is European insurance legislation, coming in force by the delegated acts of October 10, 2014. <https://eur-lex.europa.eu/legal-content/EN/TXT/?uri=OJ%3AL%3A2015%3A012%3ATOC>. Additional files, defining the structure of the Standard Formula (SF) method of the SCR-calculation are provided. The structure files can be adopted for localization or for insurance companies who use Internal Models (IM). Options are available for combining smaller components, horizontal and vertical scaling, rotation, and plotting only some circle-parts. With outlines and connectors several SCR-compositions can be compared, for example in ORSA-scenarios (Own Risk and Solvency Assessment).

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**Description**

returns a 'ggplot2' object, based on geom_segment.; it plots a line between (x and y coordinates of) those datapoints which have a matching value in the columns 'id' and 'comparewithid'. values in 'id' must be unique. For values in 'comparewithid' is uniqueness not required, but a matching value in 'id' must be present.

**Usage**

```r
gem_sii_riskconnection(data = NULL, mapping = NULL,
    stat = "sii_riskconnection", position = "identity", na.rm = FALSE,
    show.legend = NA, inherit.aes = TRUE, ...)
```

**Arguments**

- **data**
  the dataset in tidyverse format (column ‘description’ as a factor). see examples in `sii_z_ex2_data` or `sii_z_ex3_data`
- **mapping**
  required aes(thetics) : 'x' (i.e. time, longitude, integer), 'y' (i.e SCR ratio, latitude), 'id' and also 'comparewithid'
- **stat**
  default stat is statsii_riskconnection, combinations with other stat’s are not tested
- **position**
  standard ggplot function
- **na.rm**
  standard ggplot function
- **show.legend**
  standard ggplot function
- **inherit.aes**
  standard ggplot function
- **...**
  ellipsis, a standard R parameter

**Value**

a 'ggplot2' object based on 'geom_polygon'

**Examples**

```r
library(ggsolvencyii)
library(ggplot2)

sii_z_ex3_data[sii_z_ex3_data$description == "SCR", ]

ggplot() + geom_sii_riskconnection(data = sii_z_ex3_data, mapping = aes(
    comparewithid = comparewithid,
    x = time,
    y = ratio,
    id = id,
```
Description

returns a 'ggplot2' object, based on geom_path with the outlines concentric circle(part)s, defined by
the values in a hierarchy of levels. This can be used instead of geom_sii_risksurface to plot the com-
position of the SCR. When optional aes(thetic) ’comparewithid’ is passed to the geom_sii_riskoutline
then the second SCR can be an overlay over another, for easy comparison.

Usage

gem_sii_riskoutline(data = NULL, mapping = NULL,
stat = "sii_riskoutline",
structure = ggsolvencyii::sii_structure_sf16_eng, squared = FALSE,
levelmax = 99, aggregatesuffix = "_other", plotdetails = NULL,
rotationdegrees = NULL, rotationdescription = NULL,
maxscrvalue = NULL, scalingx = 1, scalingy = 1,
position = "identity", na.rm = FALSE, show.legend = NA,
inherit.aes = TRUE, ...)

Arguments

data the dataset in tidyverse format (column 'description' as a factor). see examples
in siiz_ex2_data or siiz_ex3_data
mapping required aes(thetics) : 'x' (i.e. time, longitude, integer), 'y' (i.e SCR ratio, latitidue), 'id', 'description', 'value'. Optional aes is 'comparewithid'
stat default stat is statsii_riskoutline, combinations with other stat's are not tested
structure (dataframe: default = sii_structure_sf16_eng)
A representation of the buildup from individual risks to the SCR. columns are
1. description (chr),
2. level (chr),
3. childlevel (chr)
. In the standard formula structure, SCR has level 1, with childlevel 2. This
means it consists of all datalines with level == 2, i.e. "BSCR", "operational" and "Adjustment-LACDT". lines in the dataset with a suffix "d" behind the
levelnumber are diversification items. As of now these are not used in any cal-
culation. the values in column "description" in the dataset need to match the
description in this file. The package contains also a file sii_structure_sf16_nld
with Dutch terms in description column.
**squered**
(optional, boolean, default = FALSE)
when set to TRUE plot returns a square representation. Compared with a circle representation of the same data the height and width of the square are smaller than the radius of the circle. Segments which fall in the corner parts of the square are smaller than equally sized part which fall in the vertical or horizontal parts of the square.

**levelmax**
(integer or dataframe, default = 99)
a positive integer or a dataframe with columns 'level' and 'levelmax'.
The maximum amount of items in a certain level to be plotted. The smallest items are combined to one item. In the case level consisting of 7 items has a levelmax of 5 this results in 4 separate items and one grouped item.
For a less detailed plot sii_levelmax_sf16_99S and sii_levelmax_sf16_99S are present in the package where the components of market, life, non-life, health are combined in 5 or 3 items.

**aggregatesuffix**
(string, default = "_other")
When a certain level contains more items than specified by levelmax the smallest items are combined. The description is of the name of the one higher level (lower number) with a suffix

**plotdetails**
a table with columns 'levelordescription' and 'outline1' to 'outline4', indicating which outlines of which circle elements to plot. When no table is provided all segments are plotted. example 3 shows how to combine geom_sii_risksurface and geom_sii_riskoutline by using using table sii_z_ex3_plotdetails. geom_sii_risksurface uses another column in the same table.

**rotationdegrees**
(optional, integer, -360 to 360, default = NULL)
when given, the fixed amount of degrees (positive is clockwise) of which each item is rotated (as in a compass, -90 is a quarter rotation anti-clockwise), additive to possible rotation to description

**rotationdescription**
(optional, string, default = NULL)
default the orientation of the lower level (higher number) circles is based on the structure. When this parameter is not NULL then the circles are rotated in such a way that the indicated item lies in the "north-east" part of the circle.

**maxscrvalue**
(optional, double, default = NULL)
the scale of the different plot elements is is by default measured to the largest level 1 element (i.e. SCR) in the dataset, this can be overridden by this parameter for example when combining several plots

**scalingx**
(optional, positive value ,default = 1)
for plots where units in x and y are different in magnitude distortion can occur. This parameter scales only in x-direction

**scalingy**
(optional, positive value ,default = 1)
for plots where units in x and y are different in magnitude distortion can occur. This parameter scales only in y-direction

**position**
standard ggplot function

**na.rm**
standard ggplot function
show.legend standard ggplot function
inherit.aes standard ggplot function
... ellipsis, a standard R parameter

Details
When describing an outline of a circle part 4 segments can be distinguished, radial line outwards, outer circle segment, radial line inwards, inner circle segment. Whether or not to plot these lines can be determined with an outline dataframe. by means of the column aes()value comparewithid in the data an overlay can be made to compare two SCR representations.

Value
a 'ggplot2' object geom_sii_risksurface

Examples
library(ggsolvencyii)
library(ggplot2)

## see details about id and comparewithid
# sii_z_ex3_data[sii_z_ex3_data$description == "SCR", ]

ggplot()+
geom_sii_riskoutline(data = sii_z_ex3_data, mapping = aes(
    comparewithid = comparewithid,
    x = time,
    y = ratio,
    value = value,
    id = id,
    description = description),
    color = "red",
    lwd = 0.7
))

## and with comparewithid in aes()

ggplot()+
geom_sii_riskoutline(data = sii_z_ex3_data, mapping = aes(
    comparewithid = comparewithid,
    x = time,
    y = ratio,
    value = value,
    id = id,
    description = description),
    color = "red",
    lwd = 0.7
))
**Description**

returns a ‘ggplot2’ object, based on geom_polygon, with filled, concentric circle(part)s, defined by the values in a hierarchy of levels.

**Usage**

```r
geom_sii_risksurface(data = NULL, mapping = NULL,
    stat = "sii_risksurface",
    structure = ggSolvenCyii::sii_structure_sf16_eng, squared = FALSE,
    levelmax = 99, aggregatesuffix = "_other", plotdetails = NULL,
    rotationdegrees = NULL, rotationdescription = NULL,
    maxscrvalue = NULL, scalingx = 1, scalingy = 1,
    position = "identity", na.rm = FALSE, show.legend = NA,
    inherit.aes = TRUE, ...)
```

**Arguments**

data

the dataset in tidyverse format (column 'description' as a factor). see examples in `sii_z_ex2_data` or `sii_z_ex3_data`

mapping

required aes(thetics) : x (i.e. time, longitude), y (i.e SCR ratio, latitude), id, description (), value

stat

default stat is statsii_risksurface, combinations with other stat’s are not tested

structure

(dataframe: default = `sii_structure_sf16_eng`)

A representation of the buildup from individual risks to the SCR. columns are
1. description (chr),
2. level (chr),
3. childlevel (chr)

In the standard formula structure, SCR has level 1, with childlevel 2. This means it consists of all datalines with level == 2, i.e. "BSCR", "operational" and "Adjustment-LACDT". lines in the dataset with a suffix "d" behind the levelnumber are diversification items. As of now these are not used in any calculation. the values in column "description" in the dataset need to match the description in this file. The package contains also a file `sii_structure_sf16_nld` with Dutch terms in description column.

squared

(optional, boolean, default = FALSE)

when set to TRUE plot returns a square representation. Compared with a circle representation of the same data the height and width of the square are smaller than the radius of the circle. Segments which fall in the corner parts of the square are smaller than equally sized part which fall in the vertical or horizontal parts of the square.
levelmax  (integer or dataframe, default = 99)
a positive integer or a dataframe with columns 'level' and 'levelmax'.
The maximum amount of items in a certain level to be plotted. The smallest
items are combined to one item. In the case level consisting of 7 items has a
levelmax of 5 this results in 4 separate items and one grouped item.
For a less detailed plot sii_levelmax_sf16_995 and sii_levelmax_sf16_993
are present in the package where the components of market, life, non-life, health
are combined in 5 or 3 items.

aggregatesuffix
(string, default = "," _other")
When a certain level contains more items than specified by levelmax the smallest
items are combined. The description is of the name of the one higher level (lower
number) with a suffix

plotdetails  (optional) a table with columns 'levelordescription' and 'surface', indicating
which circle elements to plot. When no table is provided all segments are plotted.
example 3 shows how to combine geom_sii_risksurface and geom_sii_riskoutline
by using using table sii_z_ex3_plotdetails. geom_sii_riskoutline uses other
columns in the same table

rotationdegrees
(optional, integer, -360 to 360, default = NULL)
when given, the fixed amount of degrees (positive is clockwise) of which each
item is rotated (as in a compass, -90 is a quarter rotation anti-clockwise), additive
to possible rotation to description

rotationdescription
(optional, string, default = NULL)
default the orientation of the lower level (higher number) circles is based on the
structure. When this parameter is not NULL then the circles are rotated in such
a way that the indicated item lies in the "north-east" part of the circle.

maxscrvalue
(optional, double, default = NULL)
the scale of the different plot elements is is by default measured to the largest
level 1 element (i.e. SCR) in the dataset, this can be overridden by this parameter
for example when combining several plots

scalingx
(optional, positive value ,default = 1)
for plots where units in x and y are different in magnitude distortion can occur.
This parameter scales only in x-direction

scalingy
(optional, positive value ,default = 1)
for plots where units in x and y are different in magnitude distortion can occur.
This parameter scales only in y-direction

position  standard ggplot function
na.rm  standard ggplot function
show.legend  standard ggplot function
inherit.aes  standard ggplot function
...
ellipsis, a standard R parameter

Value

a ggplot object
Examples

```r
## dataset human readable
library(ggsolvencyii)
library(ggplot2)
t <- tidy::spread(data = sii_z_ex1_data, key = description, value = value)
t <- as.data.frame(t)
t <- t[order(t$id),]
t <- dplyr::select( t, id, time, comparewithid, ratio, SCR, dplyr::everything())
t[1:3,1:8]

ggplot() + geom_sii_risksurface(
data = sii_z_ex1_data[sii_z_ex1_data$id == 1, ],
mapping = aes(x = time,
y = ratio,
id = id,
value = value,
description = description,
color = description,
fill = description)
) + theme_bw() +
  scale_fill_manual(name = "Risks",values = sii_x_fillcolors_sf16_eng) +
  scale_color_manual(name = "Risks",values = sii_x_edgecolors_sf16_eng)

ggplot() + geom_sii_risksurface(
data = sii_z_ex2_data,
mapping = aes(x = time, y = ratio, id = id, value = value,
description = description,
# color = description,
fill = description)
),
color = "black",
levelmax = sii_levelmax_sf16_993) +
  theme_bw() +
  scale_fill_manual(name = "Risks",values = sii_x_fillcolors_sf16_eng) +
  # scale_color_manual(name = "Risks",values = sii_x_edgecolors_sf16_eng)

ggplot() + geom_sii_risksurface(data = sii_z_ex1_data[sii_z_ex1_data$id == 1, ],
mapping = ggplot2::aes(x = time,
y = ratio,
## x and y could for example be
## longitude and latitude
## in combination with plotted map
value = value,
id = id,
description = description,
fill = description, ## optional
```
sii_debug_geom

```
color = description  ## optional
),
## all parameters are shown here,
## the values behind the outcommented are the default values
## how and what
## structure = sii_structure_sf16_eng,
## plotdetails = NULL,
## grouping
  # levelmax = 99,
  # aggregatesuffix = "other",
## scaling
  # maxscrvalue = NULL,
  # scalingx = 1,
  # scalingy = 1,
## rotation and squared
  # rotationdegrees = NULL,
  # rotationdescription = NULL,
  # squared = FALSE,
## cosmetic
  lwd = 0.25,
  # alpha = 1
) +
theme_bw() +
  scale_fill_manual(name = "risks", values = sii_z_ex1_fillcolors) +
scale_color_manual(name = "risks", values = sii_z_ex1_edgecolors)
```

**Description**
assists in finding level or description mismatches in a set parameter (tables)

**Usage**
```
sii_debug_geom(data_descriptionvector, 
structure = ggsoLvencyii::sii_structure_sf16_eng, 
aggregatesuffix = "other", levelmax = NULL, plotdetails = NULL, 
fillcolors = NULL, edgecolors = NULL)
```

**Arguments**
- **data_descriptionvector**
  (no default) the vector 'description' from the data
- **structure**
  (no default) the structure dataframe
- **aggregatesuffix**
  (optional, default = "_other"):
- **levelmax**
  (optional, no default): the levelmax dataframe, when not filled the expanded structure assumes levelmax was set to 99 for all levels.
plotdetails  (optional, no default): the plotdetails dataframe
fillcolors  (optional, no default): fillcolor parameter (list with items "description" = "color" where color can be a name, #hexcode or other)
edgecolors  (optional, no default): edgecolor parameter (list with items "description" = "color" where color can be a name, #hexcode or other)

Value

prints two comparison tables and puts them in $debug_description and $debug_level

Description

maximum number of items in a level, 99 items for levels 1-3 (SCR, BSCR/OR/ADJ, Market/life/... risks) and 3 items for lower level risk (equity/longevity/...) in a standard formula structure.

Usage

sii_levelmax_sf16_993

Format

A data frame with columns:

level string with format 'level(numeric) [<point> sublevel(numeric)] [d] i.e. 1, 2.01, 3.1d where d indicates a diversification component
levelmax positive integer indicating the total number of components to be shown in a level, consisting of the x-1 largest components and the remaining components combined in one other

Source

made from excel-file in github.com/vanzanden:

Examples

installedtable <- sii_levelmax_sf16_993
installedtable
sii_levelmax_sf16_995  sii_levelmax_sf16_995

Description

maximum number of items in a level, 99 items for levels 1-3 (SCR, BSCR/OR/ADJ, Market/life/... risks) and 5 items for lower level risk (equity/longevity/...) in a standard formula structure.

Usage

sii_levelmax_sf16_995

Format

A data frame with columns:

- **level**: string with format 'level(numeric)' [point] 'sublevel(numeric)' [d] i.e. 1, 2.01, 3.1d
  where d indicates a diversification component

- **levelmax**: positive integer indicating the total number of components to be shown in a level, consisting of the x-1 largest components and the remaining components combined in one other

Source

made from excel-file in github.com/vanzanden, from there transferred to R environment with code in preparingtables.R.

Examples

```r
installedtable <- sii_levelmax_sf16_995
installedtable
```

sii_plotdetails_sf16  sii_plotdetails_sf16

Description

A table for geom_sii_risksurface and geom_sii_riskoutline indicating which outlines of each item should be shown, specified per level and/or description. the latter overrule the former.

when defining an item (or the squared = TRUE transformation) 4 lines can be distinguished, a radialline going outwards, a circle segment (clockwise), a radialline going inwards, a circle segment (counterclockwise). These are numbered as outline1 to outline4.

Usage

sii_plotdetails_sf16
Format

A data frame with columns:

- **levelordescription** string with format 'level(numeric)' [<point> 'sublevel(numeric)'] ['d'] i.e. 1, 2.01, 3.1d where d indicates a diversification component AND/OR description(s) from the corresponding structure
- **surface** boolean (logical): the surface
- **outline1** boolean (logical): the radial line
- **outline2** boolean (logical): the outer line
- **outline3** boolean (logical): the radial line
- **outline4** boolean (logical): the inner line
- **outline11** NOT YET IMPLEMENTED: boolean (logical): analogue to outline1, but but only for the first plotted component of that level. The components in each level are plotted clockwise
- **outline13** NOT YET IMPLEMENTED: boolean (logical): analogue to outline3, but but only for the last plotted component of that level.

Source

determined based on specification of EIOPA standard formula Solvency II structure made from excel-file in [github.com/vanzanden](https://github.com/vanzanden), from there transferred to R environment with code in `preparing_tables.R`.

Examples

```r
installedtable <- sii_plotdetails_sf16
installedtable
```

Description

a standard formula structure (as of 2016), with descriptions in English.

Usage

```r
sii_structure_sf16_eng
```

Format

A data frame with columns:

- **description** string: the name of the component
- **level** string with format 'level(numeric)' [<point> 'sublevel(numeric)'] ['d'] i.e. 1, 2.01, 3.1d where d indicates a diversification component
- **childlevel** string, same format as level, indicating the level of which the components combine into this level
Source
determined based on specification of EIOPA standard formula Solvency II structure.
made from excel-file in github.com/vanzanden, from there transfered to R environment with code
in preparingtables.R.

Examples

```r
installedtable <- sii_structure_sf16_eng
installedtable
```

---

### sii_structure_sf16_nld

**Description**
a standard formula structure (as of 2016), with descriptions in Dutch.

**Usage**

```r
sii_structure_sf16_nld
```

**Format**
A data frame with columns:

- **description** string: the name of the component
- **level** string with format 'level(numeric)' ['point'] 'sublevel(numeric)'][d'] i.e. 1, 2.01, 3.1d
  where d indicates a diversification component
- **childlevel** string, same format as level, indicating the level of which the components combine into
  this level

**Source**
determined based on specification of EIOPA standard formula Solvency II structure.
made from excel-file in github.com/vanzanden, from there transfered to R environment with code
in preparingtables.R.

**Examples**

```r
installedtable <- sii_structure_sf16_nld
installedtable
```
sii_x_edgecolors_sf16_eng

---

Description

A colorset, as named list, where each risk has the edgecolor of the "motherlevel", as defined in the `NNfillcolorsNN` variable.

Usage

```
sii_x_edgecolors_sf16_eng
```

Format

A list with items in the form "`description`"= "`#colorcode`":

Source

made with `preparingtables.R` (not included in this package) which can be found on [github.com/vanzanden/ggsolvencyii](https://github.com/vanzanden/ggsolvencyii)

Examples

```
installedtable <- sii_x_edgecolors_sf16_eng
installedtable
```

---

describe

Description

A colorset, as named list, where each risk has the edgecolor of the "motherlevel", as defined in the `..fillcolors..` variable.

Usage

```
sii_x_edgecolors_sf16_nld
```

Format

A list with items in the form "`description`"= "`#colorcode`":

Source

made with `preparingtables.R` (not included in this package) which can be found on [github.com/vanzanden/ggsolvencyii](https://github.com/vanzanden/ggsolvencyii)
Examples

```r
installedtable <- sii_x_edgecolors_sf16_nld
installedtable
```

```r
sii_x_fillcolors_sf16_eng
  sii_x_fillcolors_sf16_eng
```

Description

A colorset, as named list, where each accumulationlevel and each type of risk has it’s own color, where "...other" has the same color as the "motherlevel", i.e. 'market_other' has the same color as 'market' while other 'm_..' risks have a different hue.

Usage

```r
sii_x_fillcolors_sf16_eng
```

Format

A list with items in the form "description" = "#colorcode":

Source

made with preparingtables.R (not included in this package) which can be found on [github.com/vanzanden/ggsolvencyii](https://github.com/vanzanden/ggsolvencyii)

Examples

```r
installedtable <- sii_x_fillcolors_sf16_nld
installedtable
```

```r
sii_x_fillcolors_sf16_nld
  sii_x_fillcolors_sf16_nld
```

Description

A colorset, as named list, where each accumulationlevel and each type of risk has it’s own color, where "...other" has the same color as the "motherlevel", i.e. 'market_other' has the same color as 'market' while other 'm_..' risks have a different hue.

Usage

```r
sii_x_fillcolors_sf16_nld
```
**sii_z_ex1_data**

**Format**

A list with items in the form "description"= "#colorcode":

**Source**

made with `preparingtables.R` (not included in this package) which can be found on [github.com/vanzanden/ggsolvencyii](https://github.com/vanzanden/ggsolvencyii)

**Examples**

```r
installedtable <- sii_x_fillcolors_sf16_nld
installedtable
```

```
       sii_z_ex1_data  sii_z_ex1_data
   1            1            1
   2            2            2
   3            3            3
   4            4            4
   5            5            5
   6            6            6
   7            7            7
   8            8            8
   9            9            9
  10          10          10
  11          11          11
  12          12          12
  13          13          13
  14          14          14
  15          15          15
  16          16          16
  17          17          17
  18          18          18
  19          19          19
  20          20          20
  21          21          21
  22          22          22
  23          23          23
  24          24          24
  25          25          25
  26          26          26
  27          27          27
  28          28          28
  29          29          29
  30          30          30
  31          31          31
  32          32          32
  33          33          33
  34          34          34
  35          35          35
  36          36          36
  37          37          37
  38          38          38
  39          39          39
  40          40          40
  41          41          41
  42          42          42
  43          43          43
  44          44          44
  45          45          45
  46          46          46
  47          47          47
  48          48          48
  49          49          49
  50          50          50
  51          51          51
  52          52          52
  53          53          53
  54          54          54
  55          55          55
  56          56          56
  57          57          57
  58          58          58
  59          59          59
  60          60          60
  61          61          61
  62          62          62
  63          63          63
  64          64          64
  65          65          65
  66          66          66
  67          67          67
  68          68          68
  69          69          69
  70          70          70
  71          71          71
  72          72          72
  73          73          73
  74          74          74
  75          75          75
  76          76          76
  77          77          77
  78          78          78
  79          79          79
  80          80          80
  81          81          81
  82          82          82
  83          83          83
  84          84          84
  85          85          85
  86          86          86
  87          87          87
  88          88          88
  89          89          89
  90          90          90
  91          91          91
  92          92          92
  93          93          93
  94          94          94
  95          95          95
  96          96          96
  97          97          97
  98          98          98
  99          99          99
 100        100        100

```

**Description**

eexample dataset, in tidyverse format, for the showcase of a limited structure.

**Usage**

```r
sii_z_ex1_data
```

**Format**

A data frame with columns:

- **time** numerical: a representation of an x value:
  
  The x aesthetic could also be a normal numbering, or a longitude

- **ratio** numerical: solvency II ratio, a representation of an y value:
  
  y aesthetic could also be a latitude

- **description** character: component of the structure

- **id** number: a grouping item

- **value** numerical: positive for risks, negative for diversification effects

- **comparewithid** numerical: a reference to the id of another datapoint #'

**Source**

loosely based on public SFCR report of a medium sized dutch life insurer made from excel-file in
[github.com/vanzanden](https://github.com/vanzanden), from there transfered to R environment with code in `preparingtables.R`.

**Examples**

```r
installedtable <- sii_z_ex1_data
installedtable
```
**Description**

a colorset, as named list, where each risk has the edgecolor of the "motherlevel", as defined in the `NNfillcolorsNN` variable.

**Usage**

```r
sii_z_ex1_edgecolors
```

**Format**

A list with items in the form "description"="#colorcode":

**Source**

made with `preparingtables.R` (not included in this package) which can be found on [github.com/vanzanden/ggsolvencyii](https://github.com/vanzanden/ggsolvencyii)

**Examples**

```r
installedtable <- sii_z_ex1_edgecolors
installedtable
```

---

**Description**

a colorset, as named list, where each accumulationlevel and each type of risk has it’s own color, where "...other" has the same color as the "motherlevel", i.e. 'market_other' has the same color as 'market' while other 'm_..' risks have a different hue.

**Usage**

```r
sii_z_ex1_fillcolors
```

**Format**

A list with items in the form "description"="#colorcode":

**Source**

made with `preparingtables.R` (not included in this package) which can be found on [github.com/vanzanden/ggsolvencyii](https://github.com/vanzanden/ggsolvencyii)
Examples

```
installedtable <- sii_z_ex1_fillcolors
installedtable
```

```
sii_z_ex1_levelmax  sii_z_ex1_levelmax
```

Description

maximum number of items in a level, 99 items for levels 1-3 (SCR, BSCR/OR/ADJ, Market/life/... risks) and 3 items for lower level risk (equity/longevity/...)

Usage

```
sii_z_ex1_levelmax
```

Format

A data frame with columns:

Source

made from excel-file in github.com/vanzanden, from there transfered to R environment with code in preparingtables.R.

Examples

```
installedtable <- sii_z_ex1_levelmax
installedtable
```

```
sii_z_ex1_plotdetails  sii_z_ex1_plotdetails
```

```
sii_z_ex1_plotdetails  sii_z_ex1_plotdetails
```

```
sii_z_ex1_plotdetails  sii_z_ex1_plotdetails
```

```
sii_z_ex1_plotdetails  sii_z_ex1_plotdetails
```

```
sii_z_ex1_plotdetails  sii_z_ex1_plotdetails
```

```
sii_z_ex1_plotdetails  sii_z_ex1_plotdetails
```

```
sii_z_ex1_plotdetails  sii_z_ex1_plotdetails
```

```
sii_z_ex1_plotdetails  sii_z_ex1_plotdetails
```

```
sii_z_ex1_plotdetails  sii_z_ex1_plotdetails
```

```
sii_z_ex1_plotdetails  sii_z_ex1_plotdetails
```

```
sii_z_ex1_plotdetails  sii_z_ex1_plotdetails
```

```
sii_z_ex1_plotdetails  sii_z_ex1_plotdetails
```

```
sii_z_ex1_plotdetails  sii_z_ex1_plotdetails
```

```
sii_z_ex1_plotdetails  sii_z_ex1_plotdetails
```

```
sii_z_ex1_plotdetails  sii_z_ex1_plotdetails
```

```
sii_z_ex1_plotdetails  sii_z_ex1_plotdetails
```

```
sii_z_ex1_plotdetails  sii_z_ex1_plotdetails
```

```
sii_z_ex1_plotdetails  sii_z_ex1_plotdetails
```

```
sii_z_ex1_plotdetails  sii_z_ex1_plotdetails
```

```
sii_z_ex1_plotdetails  sii_z_ex1_plotdetails
```

```
sii_z_ex1_plotdetails  sii_z_ex1_plotdetails
```

```
sii_z_ex1_plotdetails  sii_z_ex1_plotdetails
```

```
sii_z_ex1_plotdetails  sii_z_ex1_plotdetails
```

```
sii_z_ex1_plotdetails  sii_z_ex1_plotdetails
```

```
sii_z_ex1_plotdetails  sii_z_ex1_plotdetails
```

Description

sii_z_ex1_plotdetails # A table for `geom_sii_risksurface` and `geom_sii_riskoutline` indicating which outlines of each item should be shown, specified per level and/or description. the latter overrule the former.

when defining an item (or the squared = TRUE transformation) 4 lines can be distinguished, a radial line going outwards, a circle segment (clockwise), a radial line going inwards, a circle segment (counterclockwise). These are numbered as outline1 to outline4.
Usage

sii_z_ex1_plotdetails

Format

A data frame with columns:

- **levelordescription**: string with format 'level(numeric) [ <point> sublevel(numeric) ] [ 'd' ]' i.e. 1, 2.01, 3.1d where d indicates a diversification component AND/OR description(s) from the corresponding structure.
- **surface**: boolean (logical): the surface
- **outline1**: boolean (logical): the radial line
- **outline2**: boolean (logical): the outer line
- **outline3**: boolean (logical): the radial line
- **outline4**: boolean (logical): the inner line
- **outline11**: NOT YET IMPLEMENTED: boolean (logical): analogue to outline1, but only for the first plotted component of that level. The components in each level are plotted clockwise.
- **outline13**: NOT YET IMPLEMENTED: boolean (logical): analogue to outline3, but only for the last plotted component of that level.

Source

determined based on specification of EIOPA standard formula Solvency II structure made from excel-file in github.com/vanzanden, from there transferred to R environment with code in preparingtables.R.

Examples

```r
installedtable <- sii_z_ex1_plotdetails
installedtable
```

---

#### sii_z_ex1_plotdetails2

sii_z_ex1_plotdetails2 #’ A table for geom_sii_risksurface and geom_sii_riskoutline indicating which outlines of each item should be shown, specified per level and/or description. the latter overrule the former.

when defining an item (or the squared = TRUE transformation) 4 lines can be distinguished, a radiusline going outwards, a circle segment (clockwise), a radiusline going inwards, a circle segment (counterclockwise). These are numbered as outline1 to outline4.
Description

sii_z_ex1_plotdetails2 # A table for geom_sii_risksurface and geom_sii_riskoutline indicating which outlines of each item should be shown, specified per level and/or description. the latter overrule the former.
when defining an item (or the squared = TRUE transformation) 4 lines can be distinguished, a radial line going outwards, a circle segment (clockwise), a radial line going inwards, a circle segment (counterclockwise). These are numbered as outline1 to outline4.

Usage

sii_z_ex1_plotdetails2

Format

A data frame with columns:

- **levelordescription** string with format 'level(numeric)' [<point> 'sublevel(numeric)'] ['d'] i.e. 1, 2.01, 3.1d where d indicates a diversification component AND/OR description(s) from the corresponding structure
- **surface** boolean (logical): the surface
- **outline1** boolean (logical): the radial line going outwards
- **outline2** boolean (logical): the outer line
- **outline3** boolean (logical): the radial line going inwards
- **outline4** boolean (logical): the inner line
- **outline11** NOT YET IMPLEMENTED: boolean (logical): analogue to outline1, but but only for the first plotted component of that level. The components in each level are plotted clockwise
- **outline13** NOT YET IMPLEMENTED: boolean (logical): analogue to outline3, but but only for the last plotted component of that level.

Source

determined based on specification of EIOPA standard formula Solvency II structure made from excel-file in github.com/vanzanden, from there transfered to R environment with code in preparingtables.R.

Examples

```r
installedtable <- sii_z_ex1_plotdetails2
installedtable
```
Description

a adapted (compact) structure, for a life-insurer with only market and life risk and their subrisks

Usage

sii_z_ex1_structure

Format

A data frame with columns:

- **description** string: the name of the component, or a diversification level
- **level** string with format 'level(numeric)' [<point> 'sublevel(numeric)'] [d'] i.e. 1, 2.01, 3.1d where d indicates a diversification component
- **childlevel** string of the same format as level, indicating the level of which the components make up this item

Source

determined based on specification of EIOPA standard formula Solvency II structure made from excel-file in github.com/vanzanden, from there transfered to R environment with code in preparingtables.R.

Examples

```r
installedtable <- sii_z_ex1_structure
installedtable
```

Description

eexample dataset, in tidyverse format, with only one instance of a limited filled sf structure.

Usage

sii_z_ex2_data
**Format**

A data frame with columns:

- **time** numerical: a representation of an x value:
  The x aesthetic could also be a normal numbering, or a longitude
- **ratio** numerical: solvency II ratio, a representation of an y value:
  y aesthetic could also be a lattitude
- **description** character: component of the structure
- **id** number: a grouping item
- **value** numerical: positive for risks, negative for diversification effects

**Source**

loosely based on public SFCR report of a medium sized dutch life insurer made from excel-file in
[github.com/vanzanden](https://github.com/vanzanden), from there transferred to R environment with code in preparingtables.R.

**Examples**

```r
installedtable <- sii_z_ex2_data
installedtable
```

**Description**

example dataset, in tidyverse format, with all columns of the complete SF16 structure present in the data but with only a few risks filled with non-zero values,

**Usage**

```r
sii_z_ex3_data
```

**Format**

A data frame with columns:

- **time** numerical: a representation of an x value:
  The x aesthetic could also be a normal numbering, or a longitude
- **ratio** numerical: solvency II ratio, a representation of an y value:
  y aesthetic could also be a lattitude
- **description** character: component of the structure
- **id** number: a grouping item
- **value** numerical: positive for risks, negative for diversification effects
- **comparewithid** numerical: a reference to the id of another datapoint
sii_z_ex3_plotdetails

Source
loosely based on public SFCR report of a medium sized dutch life insurer made from excel-file in github.com/vanzanden, from there transfered to R environment with code in preparingtables.R.

Examples

```r
installedtable <- sii_z_ex3_data
installedtable
```

### Description

`sii_z_ex3_plotdetails` #’ A table for `geom_sii_risksurface` and `geom_sii_riskoutline` indicating which outlines of each item should be shown, specified per level and/or description. the latter overrule the former. when defining an item (or the squared = TRUE transformation) 4 lines can be distinguished, a radial line going outwards, a circle segment (clockwise), a radial line going inwards, a circle segment (counterclockwise). These are numbered as outline1 to outline4.

### Usage

`sii_z_ex3_plotdetails`

### Format

A data frame with columns:

- **levelordescription** string with format 'level(numeric) [<point> sublevel(numeric)] [d]', i.e. 1, 2.01, 3.1d where d indicates a diversification component AND/OR description(s) from the corresponding structure

- **surface** boolean (logical): the surface

- **outline1** boolean (logical): the radial line

- **outline2** boolean (logical): the outer line

- **outline3** boolean (logical): the radial line

- **outline4** boolean (logical): the inner line

- **outline11** NOT YET IMPLEMENTED: boolean (logical): analogue to outline1, but but only for the first plotted component of that level. The components in each level are plotted clockwise

- **outline13** NOT YET IMPLEMENTED: boolean (logical): analogue to outline3, but but only for the last plotted component of that level.
Source

determined based on specification of EIOPA standard formula Solvency II structure made from excel-file in github.com/vanzanden, from there transfered to R environment with code in preparingtables.R.

Examples

    installedtable <- sii_z_ex3_plotdetails
    installedtable

    sii_z_ex4_data
    sii_z_ex4_data

Description

element dataset, in tidyverse format, with several instances of a filled sf structure,

Usage

    sii_z_ex4_data

Format

A data frame with columns:

- **time** numerical: a representation of an x value:
  The x aesthetic could also be a normal numbering, or a longitude

- **ratio** numerical: solvency II ratio, a representation of an y value:
  y aesthetic could also be a lattitude

- **description** character: component of the structure

- **id** number: a grouping item

- **value** numerical: positive for risks, negative for diversification effects

- **comparewithid** numerical: a reference to the id of another datapoint #'

Source

based on public SFCR 2017 reports of a medium sized dutch life insurer in Oosterhout made from excel-file in github.com/vanzanden, from there transfered to R environment with code in preparingtables.R.

Examples

    installedtable <- sii_z_ex4_data
    installedtable
sii_z_ex4_structure

Description
maximum number of items in a level, 99 items for levels 1-3 (SCR, BSCR/OR/ADJ, Market/life/... risks) and 3 items for lower level risk (equity/longevity/...)

Usage
sii_z_ex4_levelmax

Format
A data frame with columns:

Source
made from excel-file in github.com/vanzanden, from there transferred to R environment with code in preparingtables.R.

Examples
installedtable <- sii_z_ex4_levelmax
installedtable

sii_z_ex4_structure

Description
a adapted (compact) structure with no division of market, life, .. risks in subrisks (i.e. equity, longevity,...). Descriptions are in English

Usage
sii_z_ex4_structure

Format
A data frame with columns:

description string: the name of the component, or a diversification
level string with format 'level(numeric)' [point] 'sublevel(numeric)]['d'] i.e. 1, 2.01, 3.1d where d indicates a diversification component
childlevel string of the same format as level, indicating the level of which the components make up this item
sii_z_ex6_data

Source
determined based on specification of EIOPA standard formula Solvency II structure made from excel-file in github.com/vanzanden, from there transferred to R environment with code in preparingtables.R.

Examples

installedtable <- sii_z_ex4_structure
installedtable

Description
element dataset of a internal model of a large Dutch insurer (NN group). Values are fictious

Usage

sii_z_ex6_data

Format
A data frame with columns:

- **time** numerical: a representation of an x value:
  The x aesthetic could also be a normal numbering, or a longitude

- **ratio** numerical: solvency II ratio, a representation of an y value:
  y aesthetic could also be a lattitude

- **description** character: component of the structure

- **id** number: a grouping item

- **value** numerical: positive for risks, negative for diversification effects

- **comparewithid** numerical: a reference to the id of another datapoint

Source
the structure is based on public SFCR 2017 report of NN group, with a possible wrong interpretation of diversification effects towards 'market basis and CPD risk'

# See preview.tinyurl.com/ggsolvencyii-001, page 33 linking to www.nn-group.com /nn-group /file?uuid=e3e89829 -e7bd -495a -9fed -4bc54a9349eb&owner =c5df72fd -8a65 -4f75 -956d -5e37307aa50c &contentid =2311

made from excel-file in github.com/vanzanden, from there transfered to R environment with code in preparingtables.R in the same directory.

Examples

installedtable <- sii_z_ex6_data
installedtable
Description

example dataset of a internal model of a large Dutch insurer (NN group). Values are fictitious.
To show 'counterparty default risk (CPD)' separate from the two components 'type 1' and 'type 2' the following assumption is made: The (fictitious) diversification towards the higher level from CPD risk is transferred to a position between CPD and its two components. A similar approach is used to show 'business risk', 'life risk', 'morbidity risk' and 'non-life risk' and their (7,4,4 and 4) components.

Usage

```
sii_z_ex6_data2
```

Format

A data frame with columns:

- `time` numerical: a representation of an x value:
  
  The x aesthetic could also be a normal numbering, or a longitude
- `ratio` numerical: solvency II ratio, a representation of an y value:
  
  y aesthetic could also be a latitude
- `description` character: component of the structure
- `id` number: a grouping item
- `value` numerical: positive for risks, negative for diversification effects
- `comparewithid` numerical: a reference to the id of another datapoint #'

Source

the structure is based on public SFCR 2017 report of NN group, with a possible wrong interpretation of diversification effects towards 'market basis and CPD risk'

#' See preview.tinyurl.com/ggsolvencyii-001, page 33 linking to www.nn-group.com/nn-group/file?uuid=e3e89829-e7bd-495a-9fed-4bc5a9349eb&owner=c5df72fd-8a65-4f75-956d-5e37307aa50c&contentid=2311 made from excel-file in github.com/vanzanden, from there transfered to R environment with code in preparingtables.R in the same directory.

Examples

```
installedtable <- sii_z_ex6_data2
installedtable
```
**Description**

a colorset, as named list, where each risk has the edgecolor of the "motherlevel", as defined in the ..fillcolors.. variable.

**Usage**

sii_z_ex6_edgecolors

**Format**

A list with items in the form "description"= "#colorcode":

**Source**

made with preparingtables.R (not included in this package) which can be found on github.com/vanzanden/ggsolvencyii

**Examples**

```r
installedtable <- sii_z_ex6_edgecolors
installedtable
```

---

**Description**

a colorset, as named list, where each accumulation-level and each type of risk has it's own color, where "..._other" has the same color as the "motherlevel", i.e. 'market_other' has the same color as 'market' while other 'm_..' risks have a different hue.

**Usage**

sii_z_ex6_fillcolors

**Format**

A list with items in the form "description"= "#colorcode":

**Source**

made with preparingtables.R (not included in this package) which can be found on github.com/vanzanden/ggsolvencyii
Examples

```r
installedtable <- sii_z_ex6_fillcolors
installedtable
```

```r
table <- sii_z_ex6_levelmax
sii_z_ex6_levelmax
table
```

Description

maximum number of items in a level, 99 items for levels 1-3 (SCR, BSCR/OR/ADJ, Market/life/... risks) and 3 items for lower level risk (equity/longevity/...)

Usage

```r
sii_z_ex6_levelmax
```

Format

A data frame with columns:

Source

made from excel-file in `github.com/vanzanden`, from there transferred to R environment with code in `preparingtables.R`.

Examples

```r
installedtable <- sii_z_ex6_levelmax
installedtable
```

```r
table <- sii_z_ex6_plotdetails
sii_z_ex6_plotdetails
```

A table for `geom_sii_risksurface` and `geom_sii_riskoutline` indicating which outlines of each item should be shown, specified per level and/or description. the latter overrule the former.

when defining an item (or the squared = TRUE transformation) 4 lines can be distinguished, a radial line going outwards, a circle segment (clockwise), a radial line going inwards, a circle segment (counterclockwise). These are numbered as outline1 to outline4.

Description

A table for `geom_sii_risksurface` and `geom_sii_riskoutline` indicating which outlines of each item should be shown, specified per level and/or description. the latter overrule the former.

when defining an item (or the squared = TRUE transformation) 4 lines can be distinguished, a radial line going outwards, a circle segment (clockwise), a radial line going inwards, a circle segment (counterclockwise). These are numbered as outline1 to outline4.
Usage

sii_z_ex6_plotdetails

Format

A data frame with columns:

- **levelordescription**: string with format 'level(numeric)' [ '<point>' 'sublevel(numeric)'] ['d'] i.e. 1, 2.01, 3.1d where d indicates a diversification component AND/OR description(s) from the corresponding structure
- **surface**: boolean (logical): the surface
- **outline1**: boolean (logical): the radial line
- **outline2**: boolean (logical): the outer line
- **outline3**: boolean (logical): the radial line
- **outline4**: boolean (logical): the inner line
- **outline11**: NOT YET IMPLEMENTED: boolean (logical): analogue to outline1, but only for the first plotted component of that level. The components in each level are plotted clockwise
- **outline13**: NOT YET IMPLEMENTED: boolean (logical): analogue to outline3, but only for the last plotted component of that level.

Source

determined based on specification of EIOPA standard formula Solvency II structure made from excel-file in github.com/vanzanden, from there transfered to R environment with code in preparingtables.R.

Examples

```r
installedtable <- sii_z_ex6_plotdetails
installedtable
```

---

**sii_z_ex6_structure**

**Description**

a standard formula structure (as of 2016), with descriptions in English.

Usage

sii_z_ex6_structure
**Format**

A data frame with columns:

- **description** string: the name of the component
- **level** string with format `level(numeric)` `[<point> 'sublevel(numeric)'] ['d']` i.e. 1, 2.01, 3.1d where d indicates a diversification component
- **childlevel** string, same format as level, indicating the level of which the components combine into this level

**Source**

determined based on specification of EIOPA standard formula Solvency II structure.

made from excel-file in [github.com/vanzanden](https://github.com/vanzanden), from there transferred to R environment with code in `preparingtables.R`.

**Examples**

```r
installedtable <- sii_z_ex6_structure
installedtable
```

---

**Description**

text describing the data format and usage.

**Usage**

```
sii_z_ex7_data
```

**Format**

A data frame with columns:

- **tijd** numerical: a representation of an x value:
  The x aesthetic could also be a normal numbering, or a longitude
- **ratio** numerical: solvency II ratio, a representation of an y value:
  y aesthetic could also be a lattitude
- **description** character: component of the structure
- **id** number: a grouping item
- **waarde** numerical: positive for risks, negative for diversification effects
- **vergelijkmet** numerical: a reference to the id of another datapoint #’
Source
loosely based on public SFCR report of a medium sized dutch life insurer made from excel-file in
github.com/vanzanden, from there transfered to R environment with code in preparingtables.R.

Examples
```r
installedtable <- sii_z_ex7_data
installedtable
```

Description
A table for `geom_sii_risksurface` and `geom_sii_riskoutline` indicating which outlines of each item should be shown, specified per level and/or description. the latter overrule the former.
when defining an item (or the squared = TRUE transformation) 4 lines can be distinguished, a radial line going outwards, a circle segment (clockwise), a radial line going inwards, a circle segment (counterclockwise). These are numbered as outline1 to outline4.

Usage
```r
sii_z_ex7_plotdetails
```

Format
A data frame with columns:
- `level` string with format 'level(numeric)' [sublevel(numeric)] ['d'] i.e. 1.201, 3.1d where d indicates a diversification component AND/OR description(s) from the corresponding structure
- `surface` boolean (logical): the surface
- `outline1` boolean (logical): the radial line
- `outline2` boolean (logical): the outer line
- `outline3` boolean (logical): the radial line
- `outline4` boolean (logical): the inner line
- `outline11` NOT YET IMPLEMENTED: boolean (logical): analogue to outline1, but but only for the first plotted component of that level. The components in each level are plotted clockwise
- `outline13` NOT YET IMPLEMENTED: boolean (logical): analogue to outline3, but but only for the last plotted component of that level.
Source

determined based on specification of EIOPA standard formula Solvency II structure made from excel-file in github.com/vanzanden, from there transfered to R environment with code in preparingtables.R.

Examples

```r
installedtable <- sii_z_ex7_plotdetails
installedtable
```

```r
stat_sii_risksurface  stat_sii_risksurface
```

Description

returns a ‘ggplot2’ object with filled, concentric circle(part)s, defined by the values of a hierarchy of levels.

Usage

```r
stat_sii_risksurface(mapping = NULL, data = NULL,
  geom = "sii_risksurface", position = "identity",
  show.legend = TRUE, inherit.aes = TRUE, na.rm = FALSE,
  levelmax = 99, structure = ggsolvencyii::sii_structure_sf16_eng,
  maxscrvalue = NULL, aggregatesuffix = "_other", scalingx = 1,
  scalingy = 1, rotationdegrees = NULL, rotationdescription = NULL,
  squared = FALSE, plotdetails = NULL, ...)
```

Arguments

- **mapping**: required aes(thetics) : x (i.e. time, longitude), y (i.e SCR ratio, latitude), id, description (), value
- **data**: the dataset in tidyverse format (column 'description' as a factor). see examples in sii_z_ex2_data or sii_z_ex3_data
- **geom**: the default is geom_sii_risksurface
- **position**: standard ggplot function
- **show.legend**: standard ggplot function
- **inherit.aes**: standard ggplot function
- **na.rm**: standard ggplot function
- **levelmax**: (integer or dataframe, default = 99)
  a positive integer or a dataframe with columns 'level' and 'levelmax'. The maximum amount of items in a certain level to be plotted. The smallest items are combined to one item. In the case level consisting of 7 items has a levelmax of 5 this results in 4 separate items and one grouped item. For a less detailed plot sii_levelmax_sf16_995 and sii_levelmax_sf16_993 are present in the package where the components of market, life, non-life, health are combined in 5 or 3 items.
structure (dataframe: default = sii_structure_sf16_eng)
A representation of the buildup from individual risks to the SCR. columns are
1. description (chr),
2. level (chr),
3. childlevel (chr)
In the standard formula structure, SCR has level 1, with childlevel 2. This means it consists of all datalines with level == 2, ie. "BSCR", "operational" and "Adjustment-LACDT". lines in the dataset with a suffix "d" behind the levelnumber are diversification items. As of now these are not used in any calculation, the values in column "description" in the dataset need to match the description in this file. The package contains also a file sii_structure_sf16_nld with Dutch terms in description column.

maxscrvalue (optional, double, default = NULL)
the scale of the different plot elements is is by default measured to the largest level 1 element (i.e. SCR) in the dataset, this can be overridden by this parameter for example when combining several plots

aggregatesuffix (string, default = "_other")
When a certain level contains more items than specified by levelmax the smallest items are combined. The description is of the name of the one higher level (lower number) with a suffix

scalingx (optional, positive value ,default = 1)
for plots where units in x and y are different in magnitude distortion can occur. This parameter scales only in x-direction

scalingy (optional, positive value ,default = 1)
for plots where units in x and y are different in magnitude distortion can occur. This parameter scales only in y-direction

rotationdegrees (optional, integer, -360 to 360, default = NULL)
when given, the fixed amount of degrees (positive is clockwise) of which each item is rotated (as in a compass. -90 is a quarter rotation anti-clockwise), additive to possible rotation to description

rotationdescription (optional, string, default = NULL)
default the orientation of the lower level (higher number) circles is based on the structure. When this parameter is not NULL then the circles are rotated in such a way that the indicated item lies in the "north-east" part of the circle.

squared (optional, boolean, default = FALSE)
when set to TRUE plot returns a square representation. Compared with a circle representation of the same data the height and width of the square are smaller than the radius of the circle. Segments which fall in the corner parts of the square are smaller than equally sized part which fall in the vertical or horizontal parts of the square.

plotdetails (optional) a table with columns 'levelordescription' and 'surface', indicating which circle elements to plot. When no table is provided all segments are plotted. example 3 shows how to combine geom_sii_risksurface and geom_sii_riskoutline
by using using table `sii_z_ex3_plotdetails`. `geom_sii_riskoutline` uses other columns in the same table

... ellipsis, a standard R parameter

**Value**

a ggplot object
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