

Tools for Constructing Composite Indicators

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Abstract

Keywords: composite indicators, CIP, R.

1. Introduction

2. Example session

3. Data sets

3.1. CIP: The Competitive Industrial Performance Index

3.2. TAI: Technology achievement index

4. The (ten) steps for constructing a composite indicators

5. The ProcessControl class

```
> library(CItools)
> ctr <- ProcessControl()
> names(ctr)
```

```
[1] "aggregation"      "normalization"    "weights"          "missingindicator"
[5] "cleaning"         "setmax"           "setmin"
```

6. The compind class

```
> library(CItools)
> data(cip)
> head(cip)
```

	country	ISOcode	year	MVApc	MXpc	MHVash	MVAsh	MXsh
1	Albania	8	1996	93.38696	55.45967	NA	9.455400	10.025371
2	Albania	8	1997	70.41306	34.48729	2.013606	7.886519	12.931489
3	Albania	8	1998	91.57565	57.04980	5.119037	9.062150	4.986206
4	Albania	8	1999	123.16641	103.22675	7.703302	11.045816	8.311419
5	Albania	8	2000	121.73711	77.70033	7.610967	10.170708	6.559917
6	Albania	8	2001	129.18137	90.44488	12.307333	10.103809	6.639842

	MXsh	ImWMVA	ImWMT
1	82.00571	0.005855031	0.004294599
2	77.68516	0.004185166	0.002532108
3	84.84187	0.005364120	0.004132572
4	90.59448	0.006926821	0.007212425
5	91.52747	0.006493174	0.004934976
6	91.51321	0.007011170	0.005961145

```
> index_cip = compind(country~., time="year", for.period = 2004:2010, data=cip,
+   ISOcode='ISOcode', ISOtype='UN',
+   ctr=ProcessControl(weights=c("fixed", 1/6, 1/6, 1/12, 1/12, 1/12, 1/12, 1/6, 1/6), a
+   class(index_cip)
```

```
[1] "compind"
```

```
> names(index_cip)
```

```
[1] "index"          "ranking"         "indicator.array"
[4] "normindicator.array" "weight.array"    "call"
[7] "ctr"            "ISOtype"         "ISOcode"
[10] "ISO.entity"     "time.length"
```

7. Visualization of composite indicators

7.1. Radial plot

First we present a radial plot if the CIP index for one year and several countries.

```
> library(CItools)
> data(cip)
> head(cip)
> ## compute Composite index (eight-indicators linear) for a range of years
> ## ISOcode specifies the column name containing ISOCode.
> ## ISOtype specifies what ISO code it is. In CIP, ISO code is numeric hence UN
```

```

> ##
> index_cip1 = compind(country~., time="year", for.period = 2010, data=cip,
+   ISOcode='ISOcode', ISOtype='UN',
+   ctr=ProcessControl(weights=c("fixed", 1/6, 1/6, 1/12, 1/12, 1/12, 1/12, 1/6, 1/6),
+   aggregation="linear"))
> plot(index_cip1, which = 'radial plot', entity=c('India', 'Japan', 'United Kingdom'))
>

> ## compute Composite index (eight-indicators linear) for a range of years
> index_cip = compind(country~., time="year", for.period = 2004:2010, data=cip,
+   ISOcode='ISOcode', ISOtype='UN',
+   ctr=ProcessControl(weights=c("fixed", 1/6, 1/6, 1/12, 1/12, 1/12, 1/12, 1/6, 1/6),
+   aggregation="linear"))
> plot(index_cip, which='radial plot', entity = 'Japan')

```

8. Sensitivity Analysis

9. Conclusions

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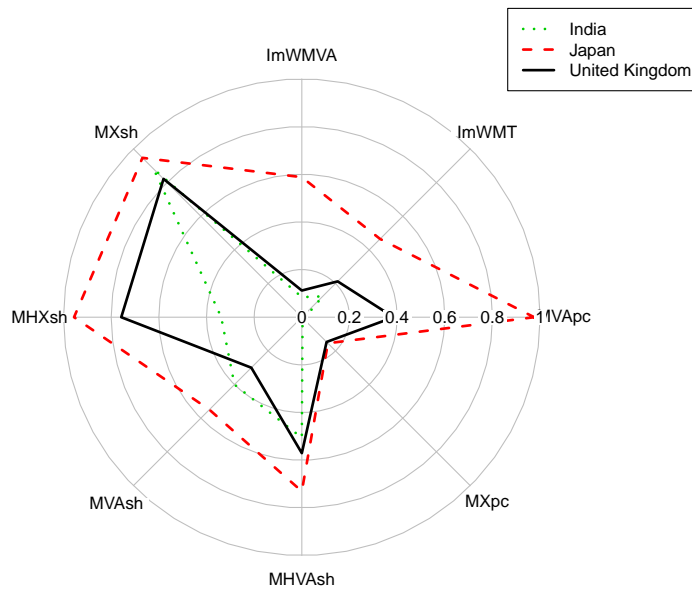


Figure 1: Radial plot for CIP index: one year and several countries.

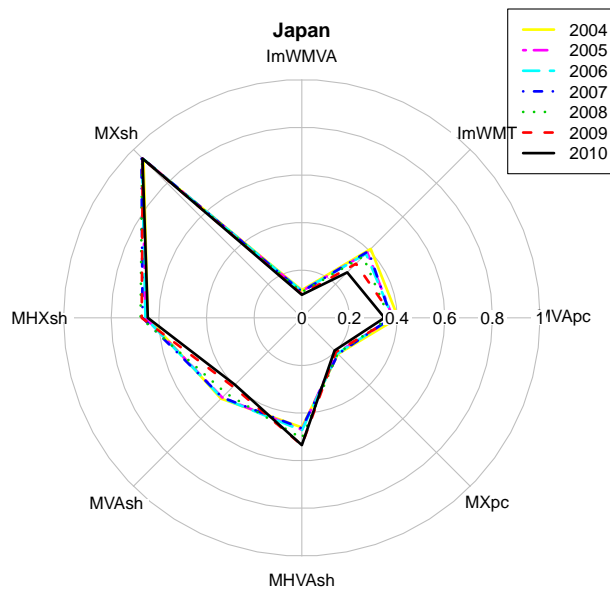


Figure 2: Radial plot for CIP index: one a range of years and one country.