FUNDAMENTAL DRIVERS OF INTERNATIONAL PRICE AND CONSUMPTION DISPARITIES

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OBJECTIVE

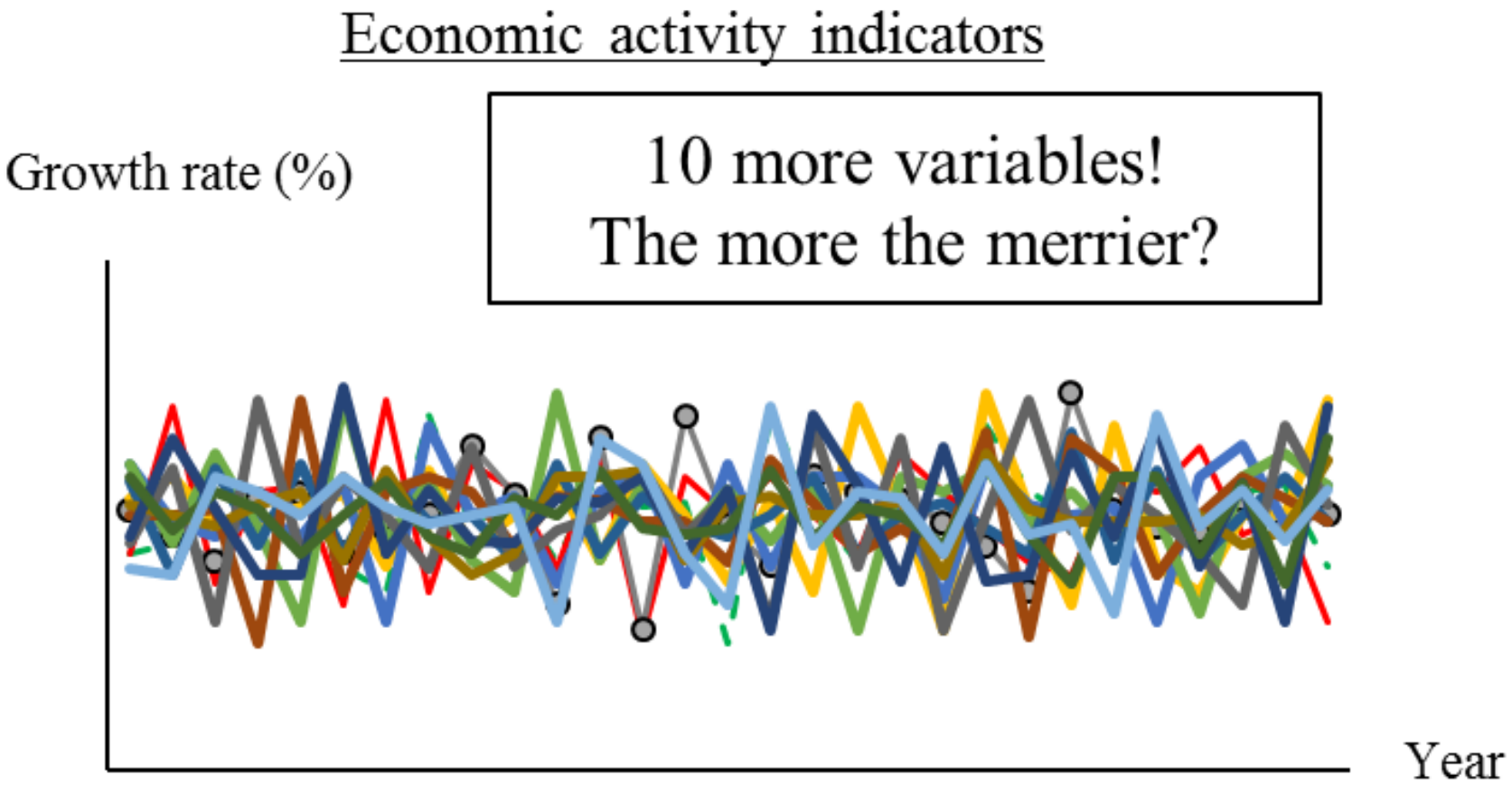
- Is it possible to summarise the information contained in a large amount of economic variables?
- Yes
- Data dimension reduction technique, principal component analysis
- Consumption patterns in large number of countries is explained is predominantly by one determinant, closely related to income
- Income plays a minor role in global pricing behaviour.

MOTIVATION

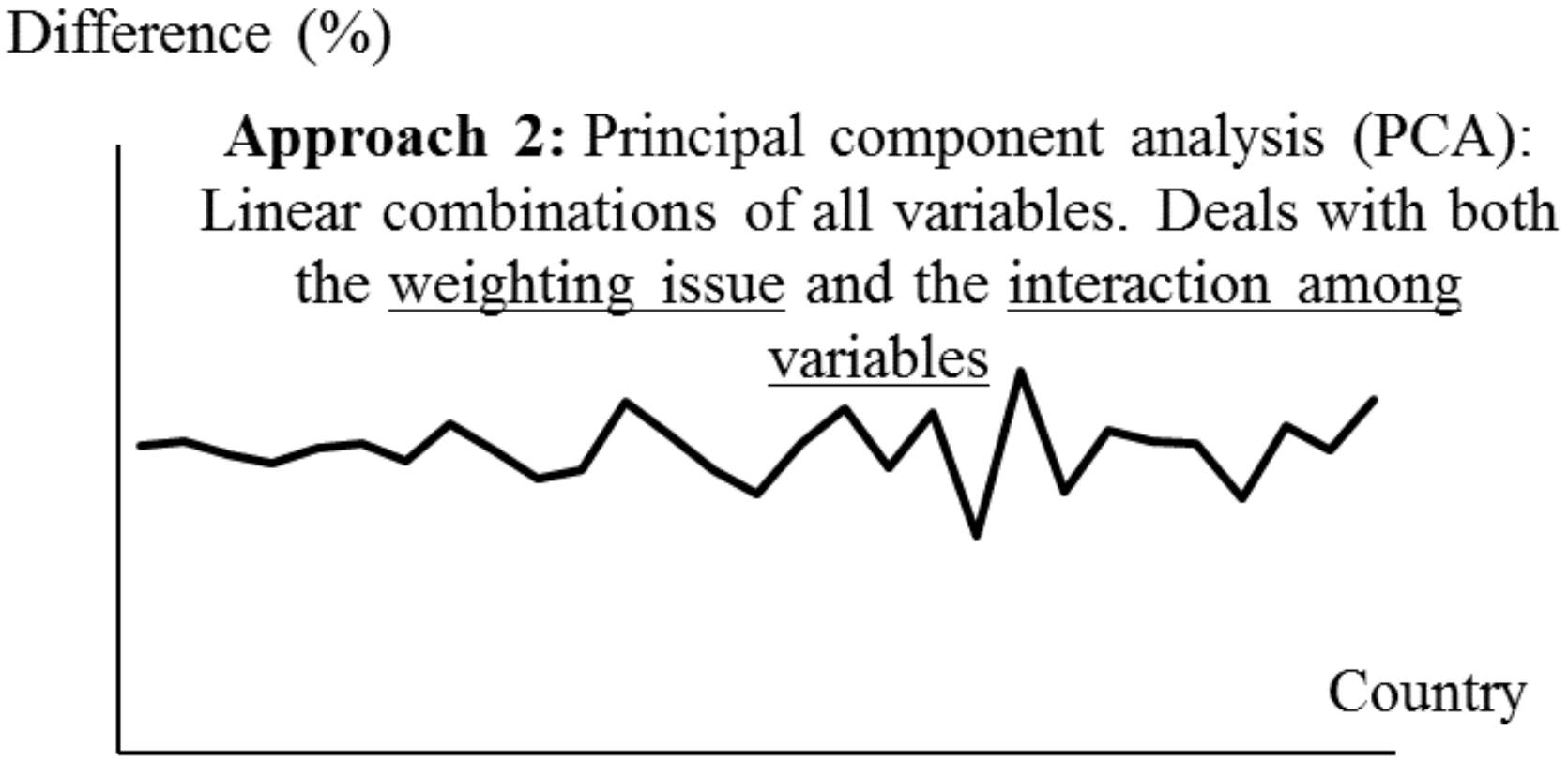
- Increasing availability of high frequency, large datasets

- Is this information useful in measuring economic activity?

OBSERVABLE ECONOMIC ACTIVITIES



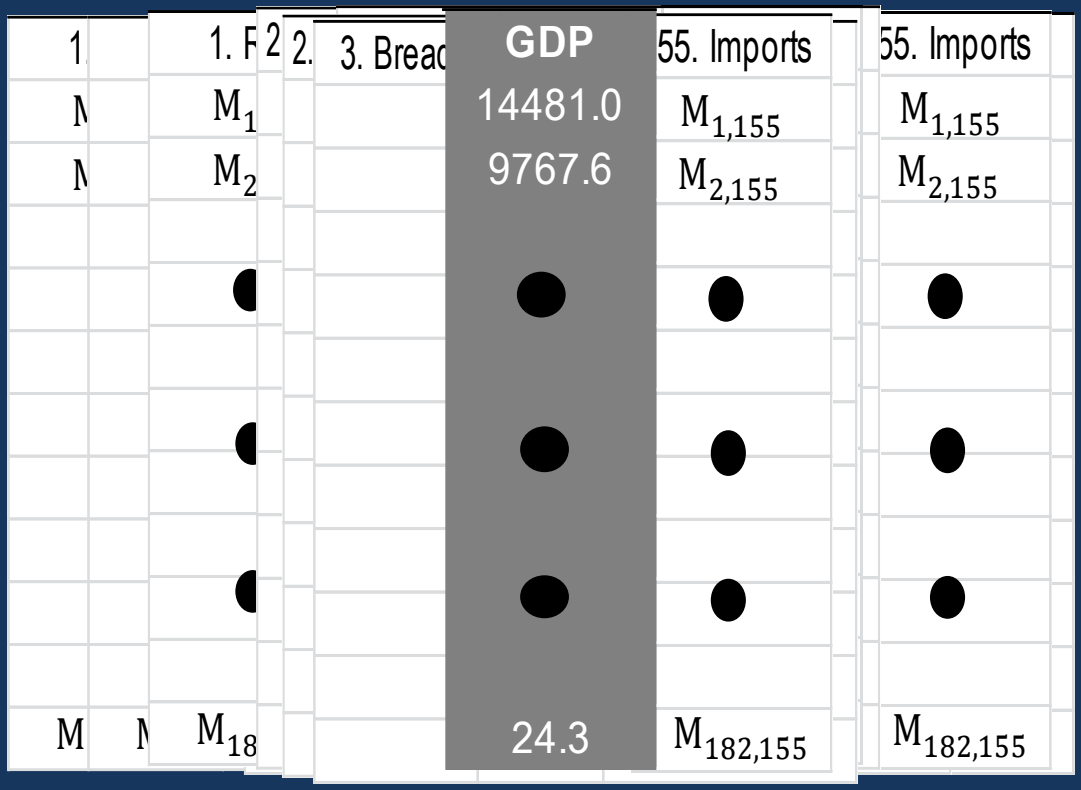
FROM TIME TO SPACE: CROSS-SECTIONAL DATA



OUR DATA: ICP, 2011 ROUND

Values of…

182 Countries
1. Algeria
2. Angola
3. Benin
4. Botswana
5. Burkina Faso
…
178. Sudan (WAS)
179. United Arab Emirates
180. Yemen
181. Georgia
182. Iran, Islamic Rep.



$182 \times 155 = 28,210$ **elements**

FOOD CONSUMPTION IN OECD COUNTRIES

Sample

- International Comparison Program, 2011 round

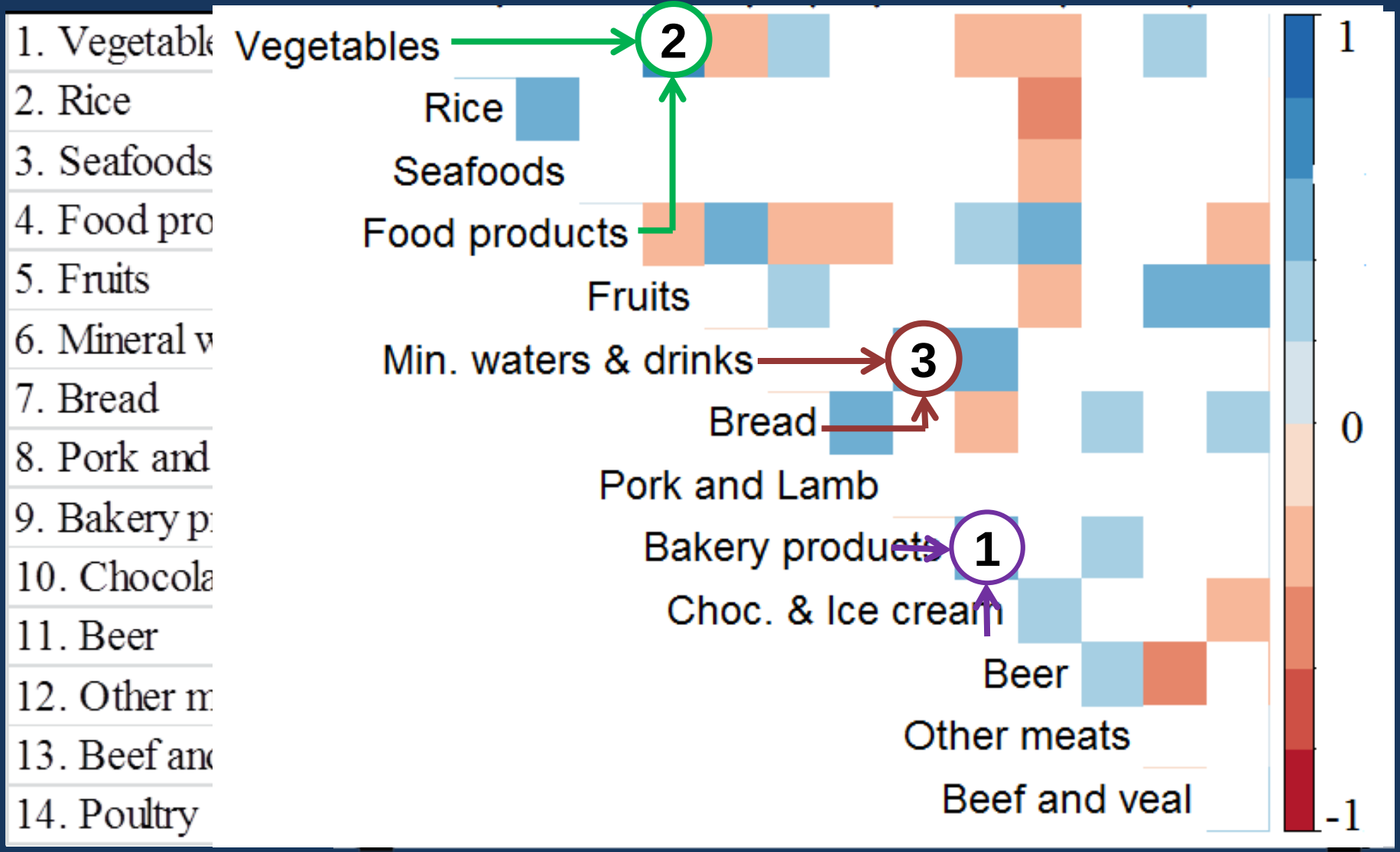
14 Food Items, 46 OECD countries

Two variables:

Consumption

Relative prices

CONSUMPTION CORRELATION MATRIX



A PRIMER ON PCA

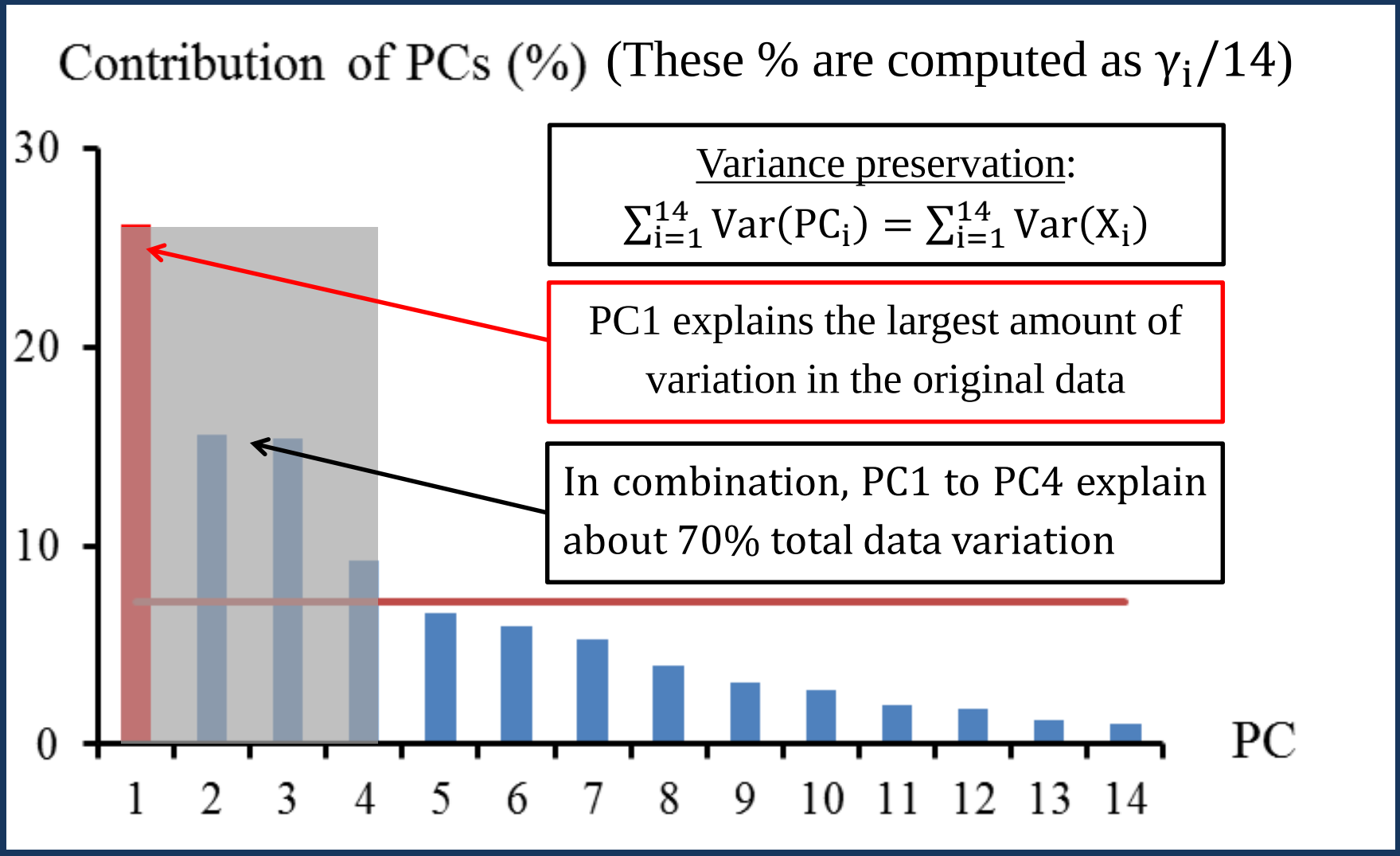
$$PC_i = \mathbf{X} a_i \quad (i = 1, \ldots, 14)$$

Data matrix

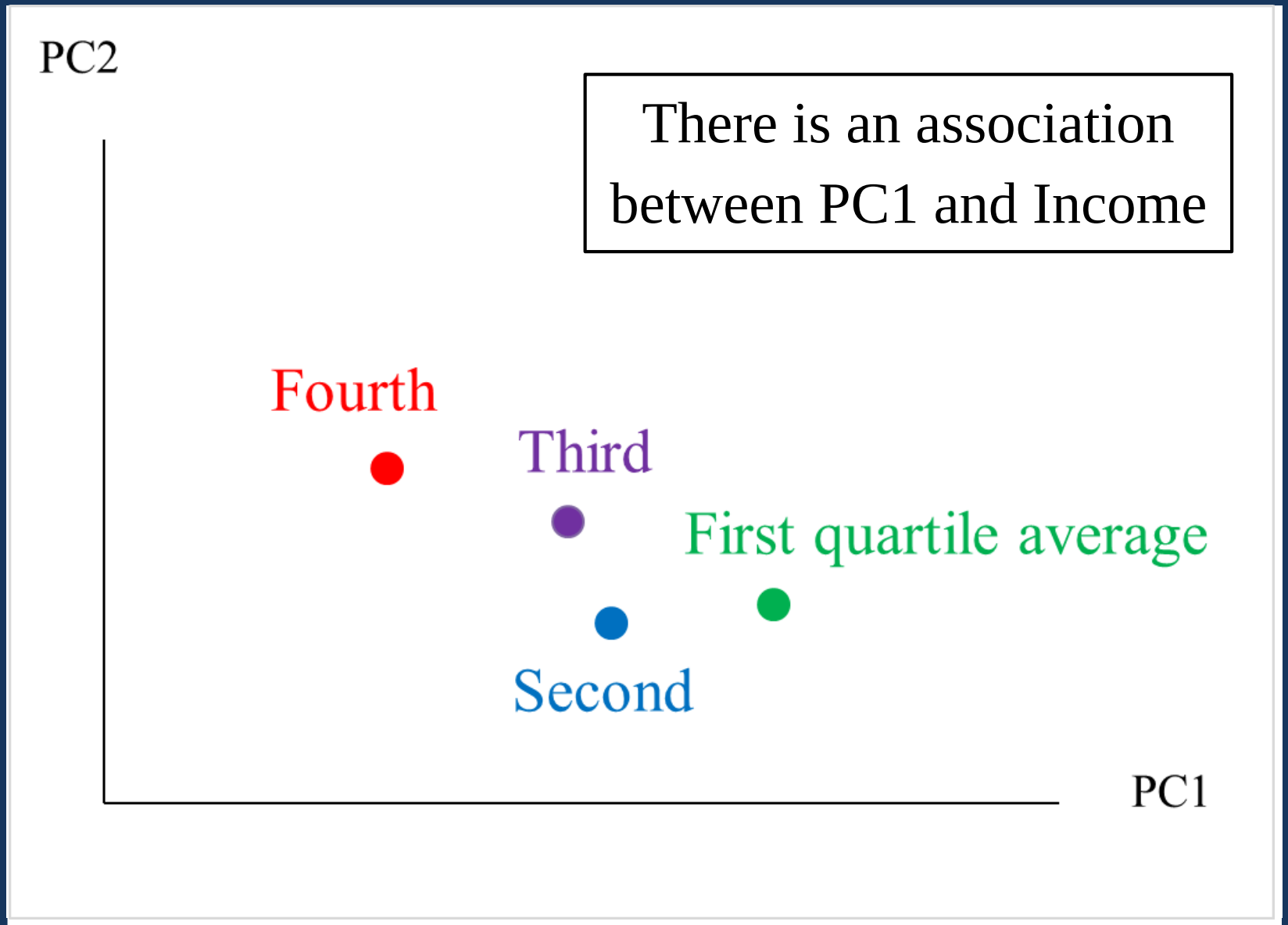
First PC (i = 1):

$$\begin{aligned}
pc_{1,1} &= x_{1,1}a_{1,1} + x_{2,1}a_{2,1} + \cdots + x_{1,14}a_{14,1} \\
pc_{2,1} &= x_{2,1}a_{1,1} + x_{2,2}a_{2,1} + \cdots + x_{2,14}a_{14,1} \\
&\vdots \qquad\qquad \vdots \qquad\qquad \vdots \\
pc_{46,1} &= x_{46,1}a_{1,1} + x_{46,2}a_{2,1} + \cdots + x_{46,14}a_{14,1}
\end{aligned}$$

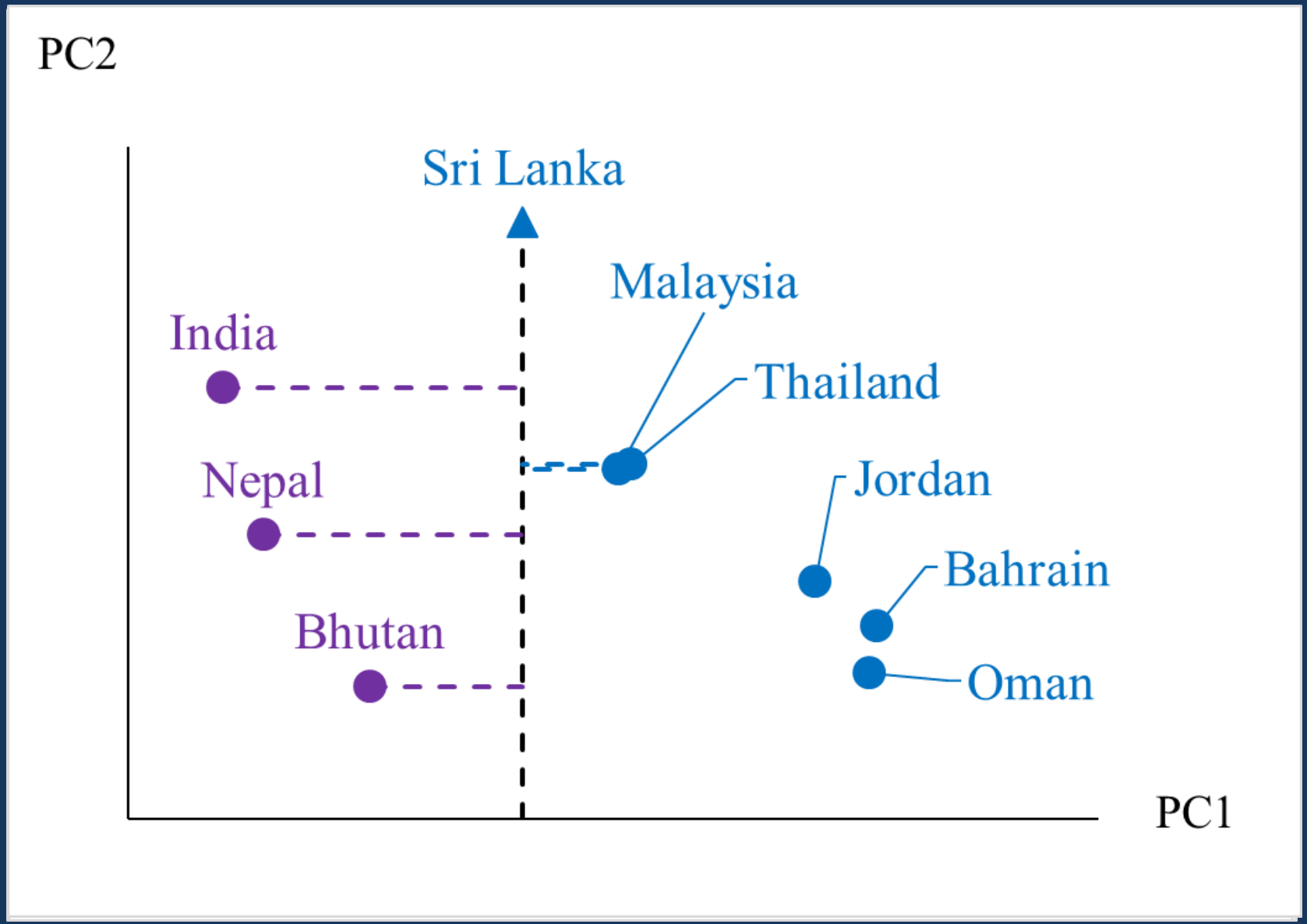
SCREE PLOT


Contribution of PCs (%) (These % are computed as $\gamma_i/14$)
30
20
10
0
1 2 3 4 5 6 7 8 9 10 11 12 13 14
PC
Variance preservation:
$\sum_{i=1}^{14} \mathrm{Var}(PC_i) = \sum_{i=1}^{14} \mathrm{Var}(X_i)$
PC1 explains the largest amount of variation in the original data
In combination, PC1 to PC4 explain about 70% total data variation

PC_1 AND PC_2, OECD COUNTRIES



PC_1 AND PC_2, 22 ASIAN COUNTRIES



NATIONAL CUISINES?

Sri Lanka

Most consumed items

- Rice
- Seafoods
- Vegetables

Least consumed items

- Pork and Lamb
- Beer
- Other meats

TAKEAWAYS

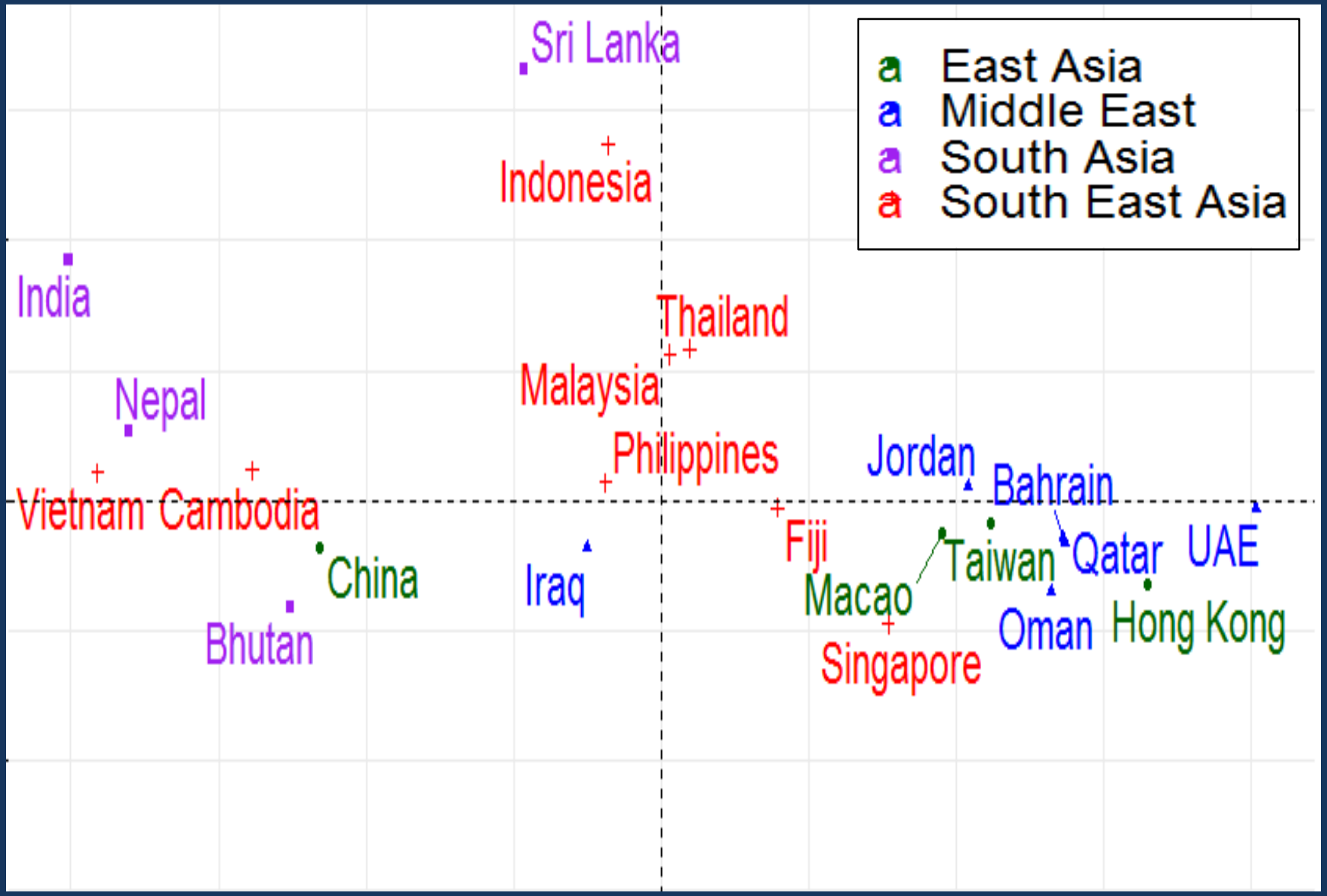
Evidence that SKL food consumption pattern is:

1- Different from the rest of the SA countries

2- More similar to countries in the same income quartile such as Malaysia or Thailand

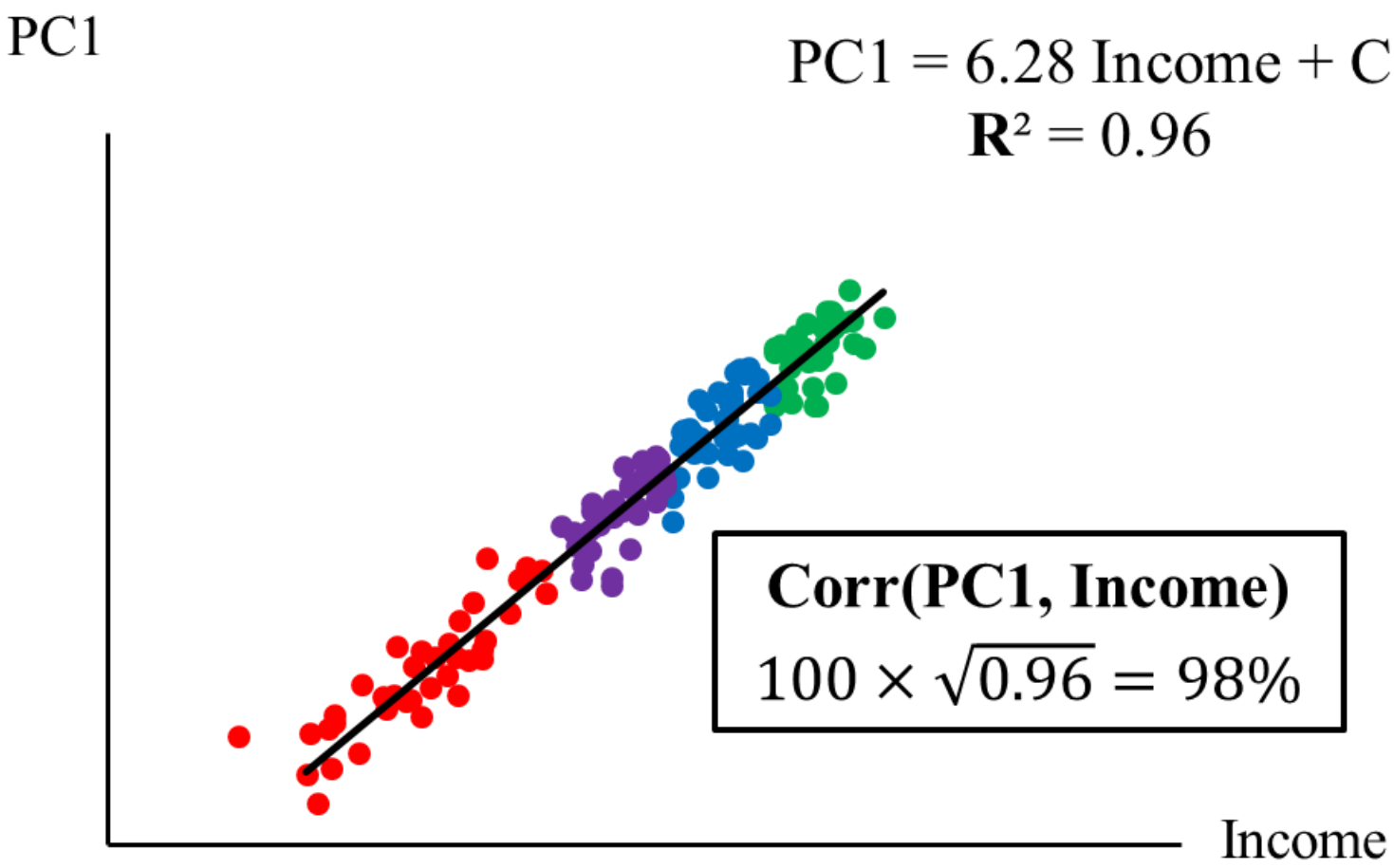
PC1 picks up the effect of rising income in SKL

OTHER GEOGRAPHICAL CLUSTERS

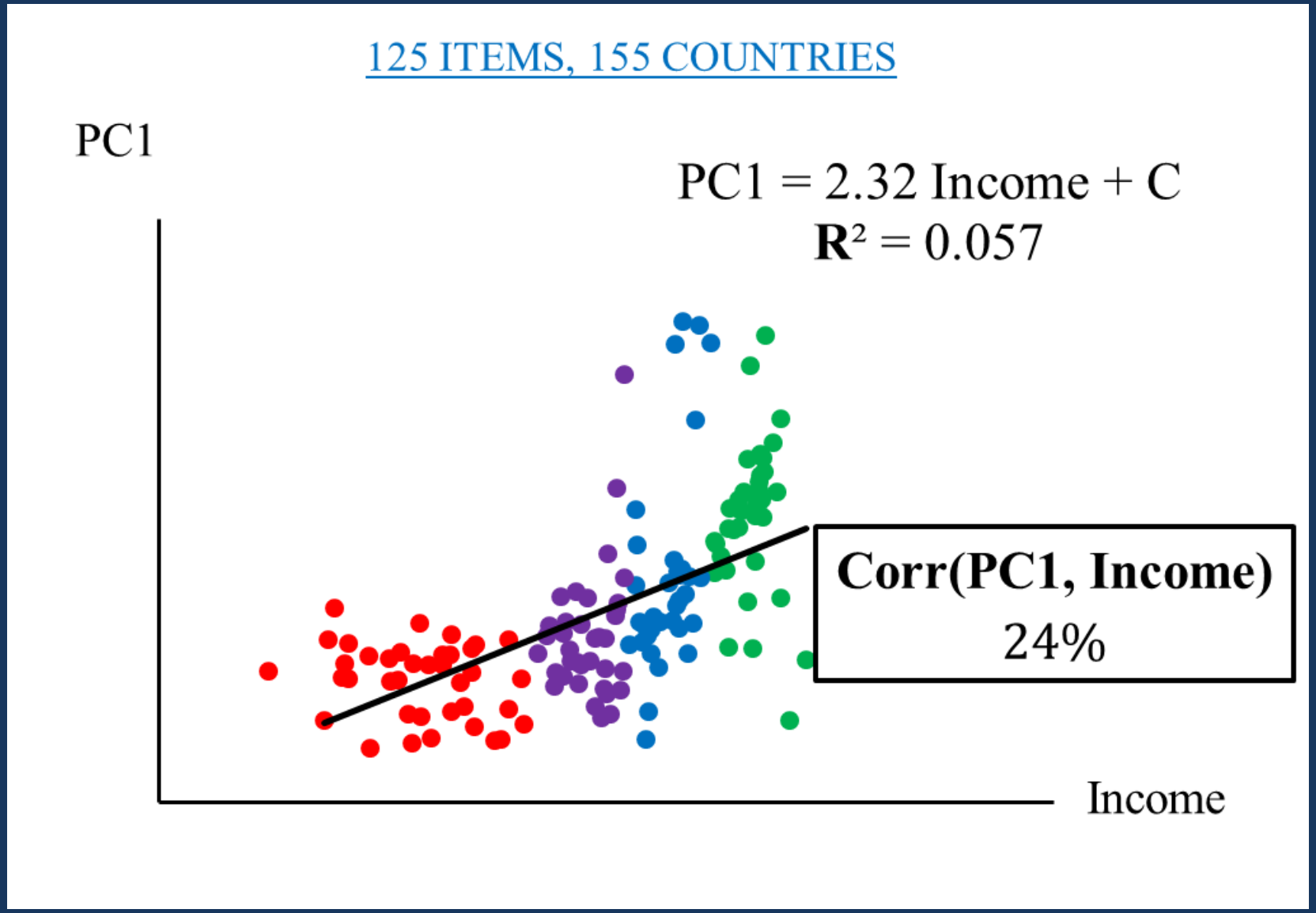


CONSUMPTION PC1 VS. INCOME

125 ITEMS, 155 COUNTRIES



PRICE PC1 VS. INCOME



CONCLUSIONS : PCA APPLICATION

- PCA is a powerful *dimensional reduction* technique, particularly when the data correlation structure is complex and/or distribution of variables differ across items.

- In combination with high-quality data from the ICP, PCA allows us to obtain a *clear economic implication* for the common factor determining international consumption

CONCLUSIONS: ICP APPLICATION

	Prices	Consumption	Remark
Total data variation explained by PC1	86%	42%	*It is easier to summarise price co - movement with a common factor*
PC1 variation explained by Income	24%	98%	*The common factor of consumption is predominantly determined by affluence*

Consumption being driven mostly by local factors (income, in particular), while there is a tendency for prices to be globally determined (via trade, for example).

MY TIME MUST BE UP.

THANK YOU!

QUESTIONS & COMMENTS?