

What are the main issues ?

- Quantitative analysis of economic, demographic, anthropological transitions and their interactions in History
 - Highlighting the specific profiles of each transition
 - Study of the complex relations between these transitional phenomena
- Can we achieve these objectives with cross-sectional data ?

Clustering and Time serialization

- Economic transition : Clustering of countries
 - Active variables for Hierarchical Cluster Analysis HCA

- Initial active variables
 - %VA in the following sectors : Agriculture, Industry, Services
 - %Employment in the following sectors : Agriculture, Industry, Services
- Additional criterion of intra-class homogeneity
 - GDP per capita

- Final active variables: Variables in parentheses (right term)

$$\left(\frac{GDP}{Pop}\right) = \sum_{i=1}^3 \left(\frac{Pop_{15-64}}{Pop}\right) \times \left(\frac{\sum_{u=1}^3 E_u}{Pop_{15-64}}\right) \times \left(\frac{E_i}{\sum_{u=1}^3 E_u}\right) \times \left(\frac{GDP_i}{E_i}\right)$$

Pop is the total population,
 Pop_{15-64} is the population from 15 to 64 years old,
 E_i is the employment by sector,
 $\sum_{u=1}^3 E_u$ is the total employment,
 GDP_i is the GDP of sector i .

- Time serialization of the economic clusters
 - Monotonous transitional variable to be used : % Jobs in agriculture

- Demographic transition : Clustering of countries
 - Active variables for Hierarchical Cluster Analysis HCA

- Initial active variables
 - Birth rate
 - Death rate

- Additional criterion of intra-cluster homogeneity
 - Net migration rate?

- Final active variables: Terms on the right

Fundamental equations.

Equation 1 : $(PGR)_t = (RNI)_t + (NMR)_t$

Equation 2 : $(PGR)_t = (BR)_t - (DR)_t + (NMR)_t$

$(PGR)_t$: The population Growth Rate at the date t .
 $(RNI)_t$: The Rate of Natural Increase at the date t
 $(NMR)_t$: The Net Migration Rate at the date t .
 $(BR)_t$: Refers to the Birth Rate at the date t .
 $(DR)_t$: Refers to the Death Rate at the date t .

- Time serialization of the demographic clusters
 - Monotonous transitional variable to be used : Infant Mortality Rate

- Anthropological Clustering of countries
 - Active variables for Hierarchical Cluster Analysis HCA

- Traditional vs Secular-rational values

- Traditional values dimension

- Societies near the traditional pole emphasize the importance religion, of parent-child ties and deference to authority, along with absolute standards and traditional family values, and reject divorce, abortion, euthanasia, and suicide.
- These societies have high levels of national pride, and a nationalistic outlook.

- Societies with secular-rational values

- have the opposite preferences on all of these topics

- Survival vs Self-expression values

- Survival values

- emphasis on economic and physical security above all

- Self-expression values

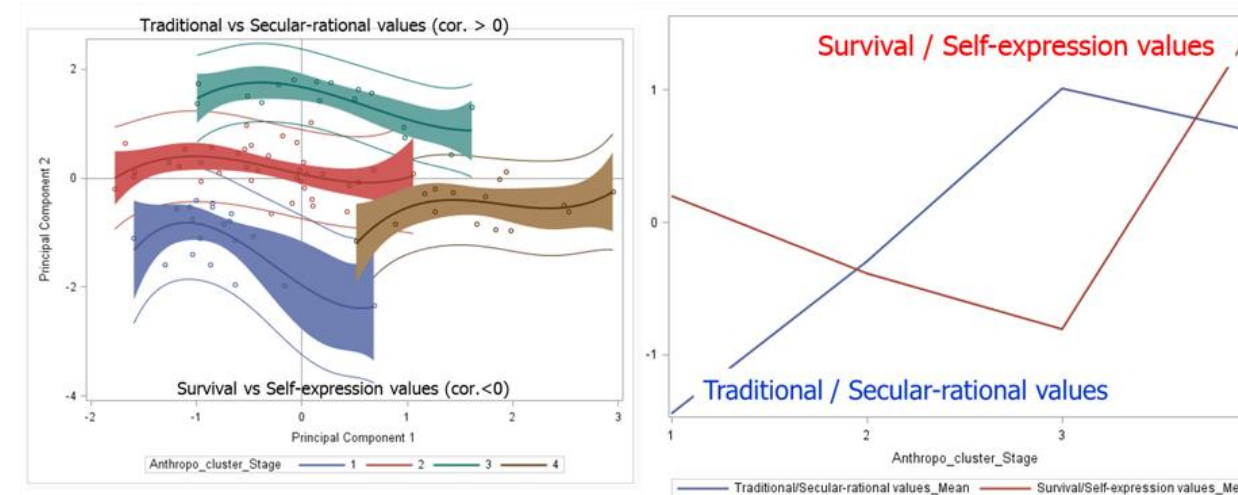
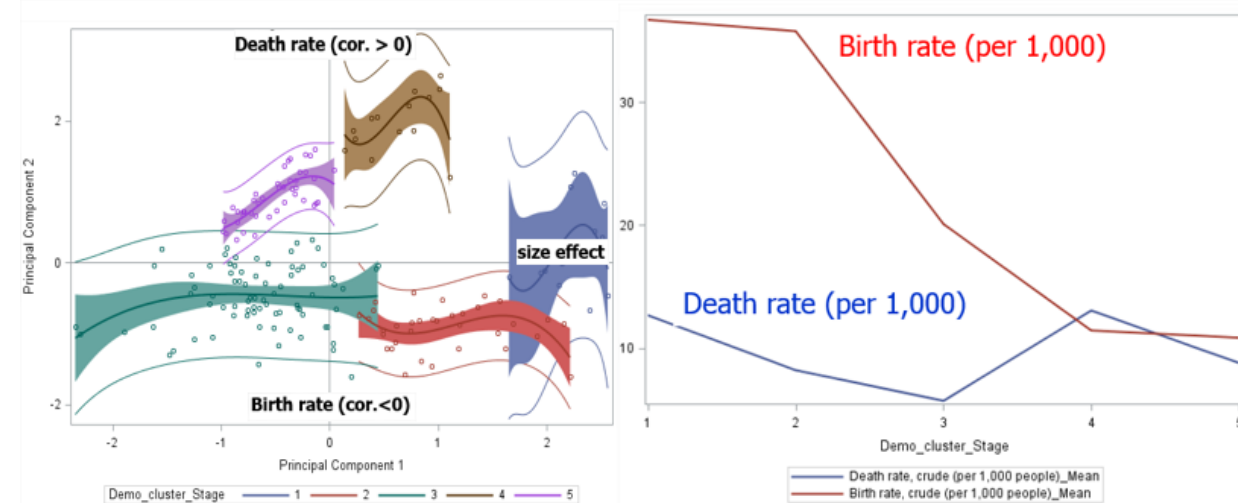
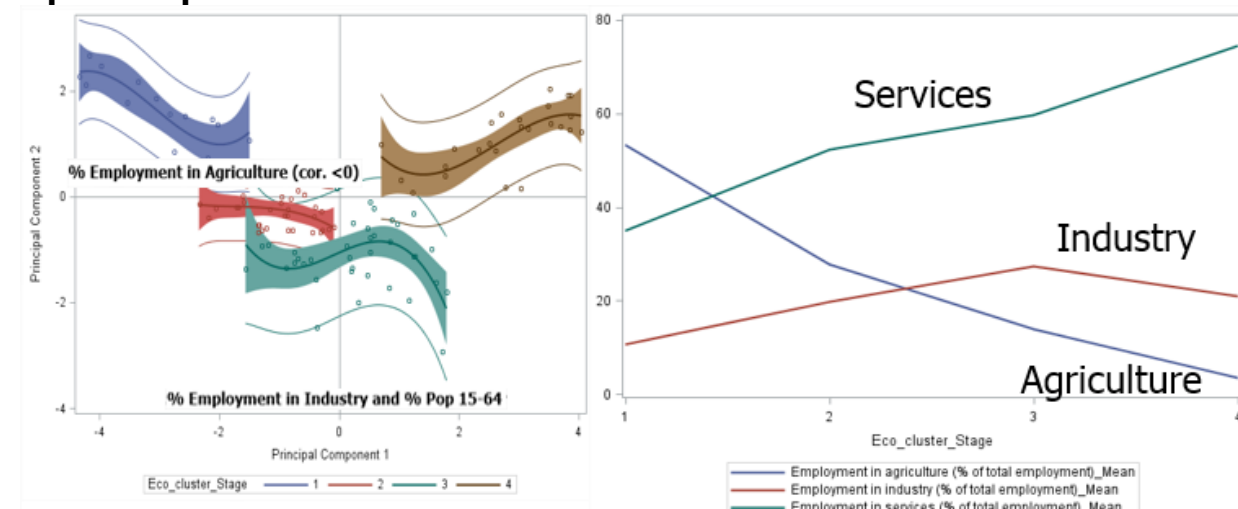
- emphasis on subjective well-being, self-expression and the quality of life.

- Time serialization of the anthropological clusters

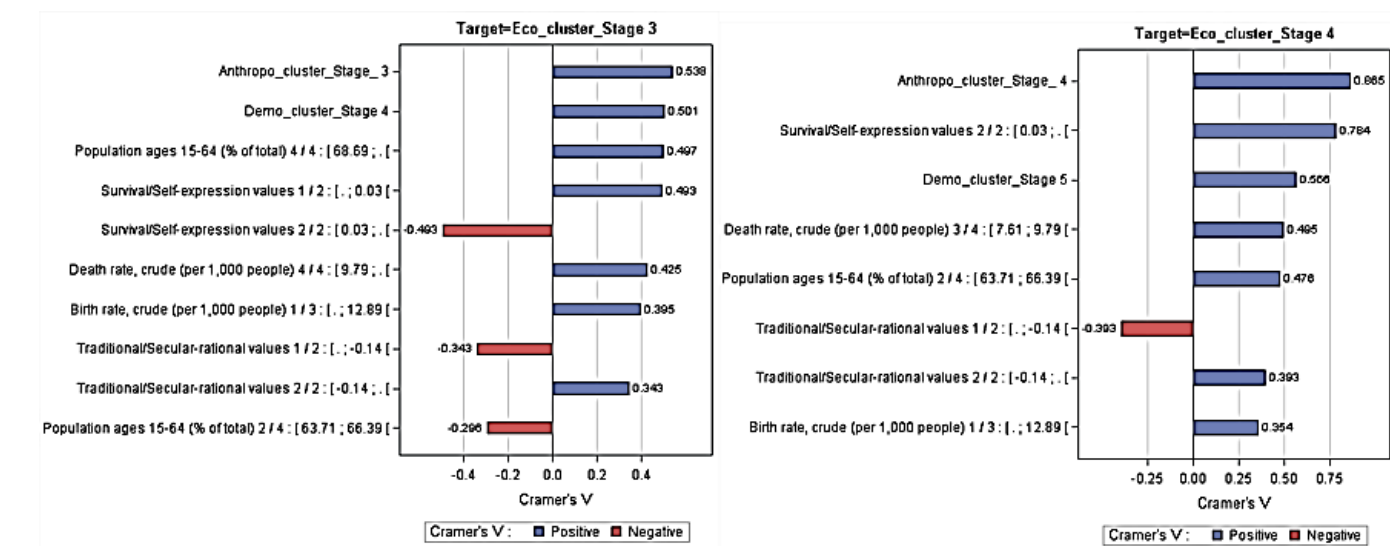
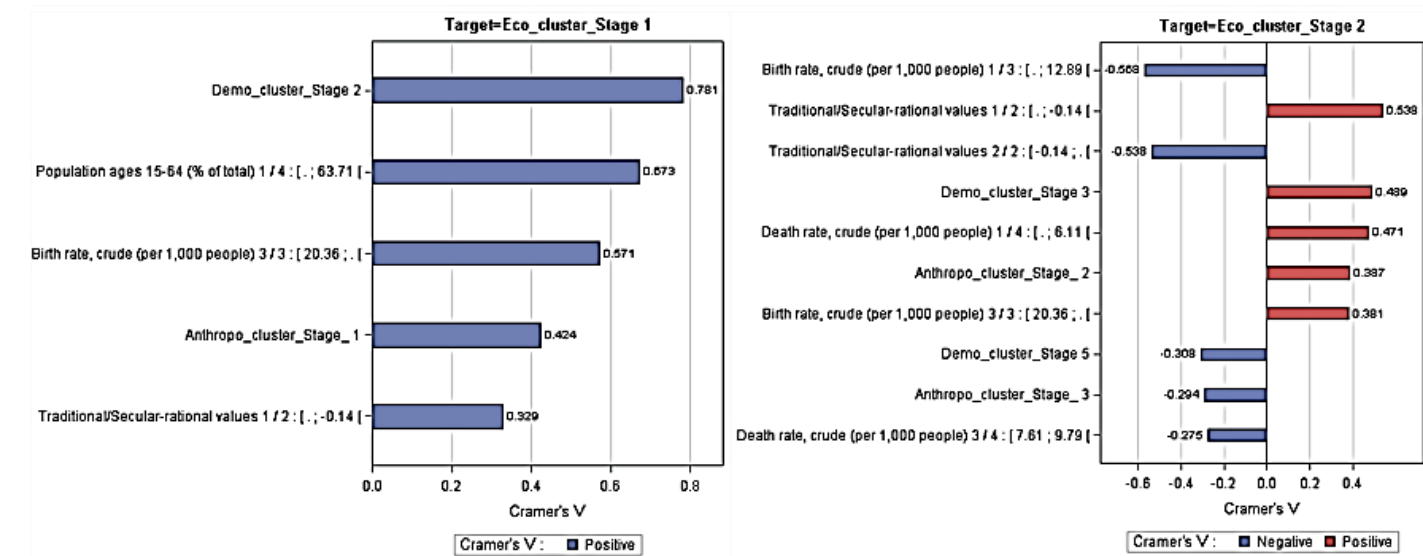
- Monotonous transitional variable to be used : Infant Mortality Rate

Main Results

Specific profiles of each transition



Significant and complex associations between phases from different transitions



Conclusion

- Through this study, we were able to:
 - Derive longitudinal conclusions from cross-sectional data, by using Clustering and Time serialization techniques
 - Discover the phases currently observable among the countries of the world, for each of the 3 transitions (economic, demographic, anthropological)
 - Demonstrate significant and complex associations between phases from different transitions
- Next steps with cross-sectional approach
 - Social Classes transition
 - Institutional transition

References

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