DEPF Etudes

Economic complexity and development: Strategies for the structural diversification of the Moroccan economy

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Introduction

- Morocco has managed, from the beginning of the 2000s, to **accelerate the growth rate** of its per capita income and to improve its **economic specialization** profile thanks to the emergence of **new industries** with high potential.
- However, the potential of this transformative momentum is **far from being fully mobilized**.
- Even though the pace of growth of the Moroccan economy is increasing, it remains globally **insufficient** to allow an **accelerated convergence** of Morocco towards the **income levels** of **developed** and emerging countries.

Introduction (cont'd)

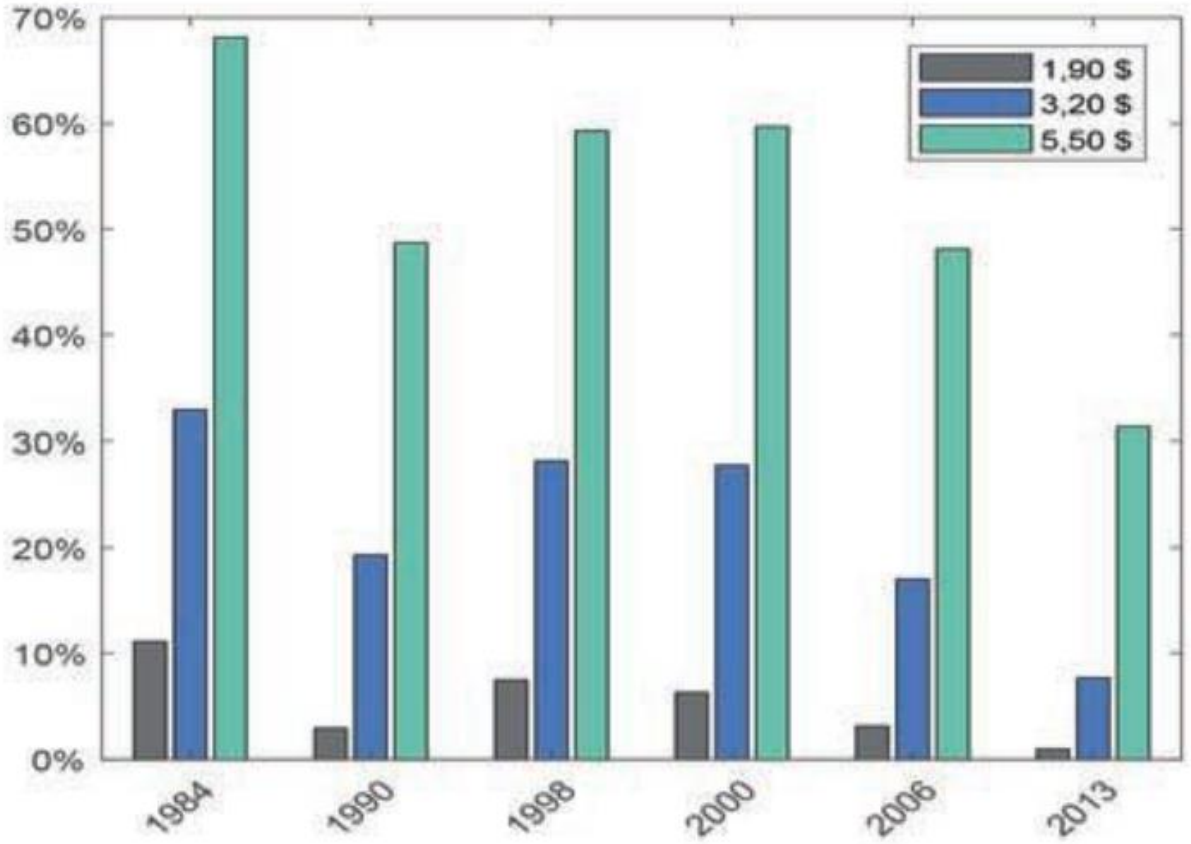
- Recent developments in the theoretical and empirical concept of **economic complexity** have opened up **new opportunities** to study the process of **economic development** as a process of **structural transformation.**
- This line of research has led to the **development of a set of measures**, including the **Economic Complexity Index**, which measures the productive capabilities a company mobilizes.
- Recent empirical work has shown that **differences in development** between countries can be **explained by differences in economic complexity**.

Introduction (cont'd)

- Given its interest in structural issues with a strong impact on the development trajectory of our country, the Department of Economic Studies and Financial Forecast (DEPF) has deemed it useful to examine in depth the process of **structural transformation** of the **Moroccan economy** in the light of the concept of **economic complexity.**

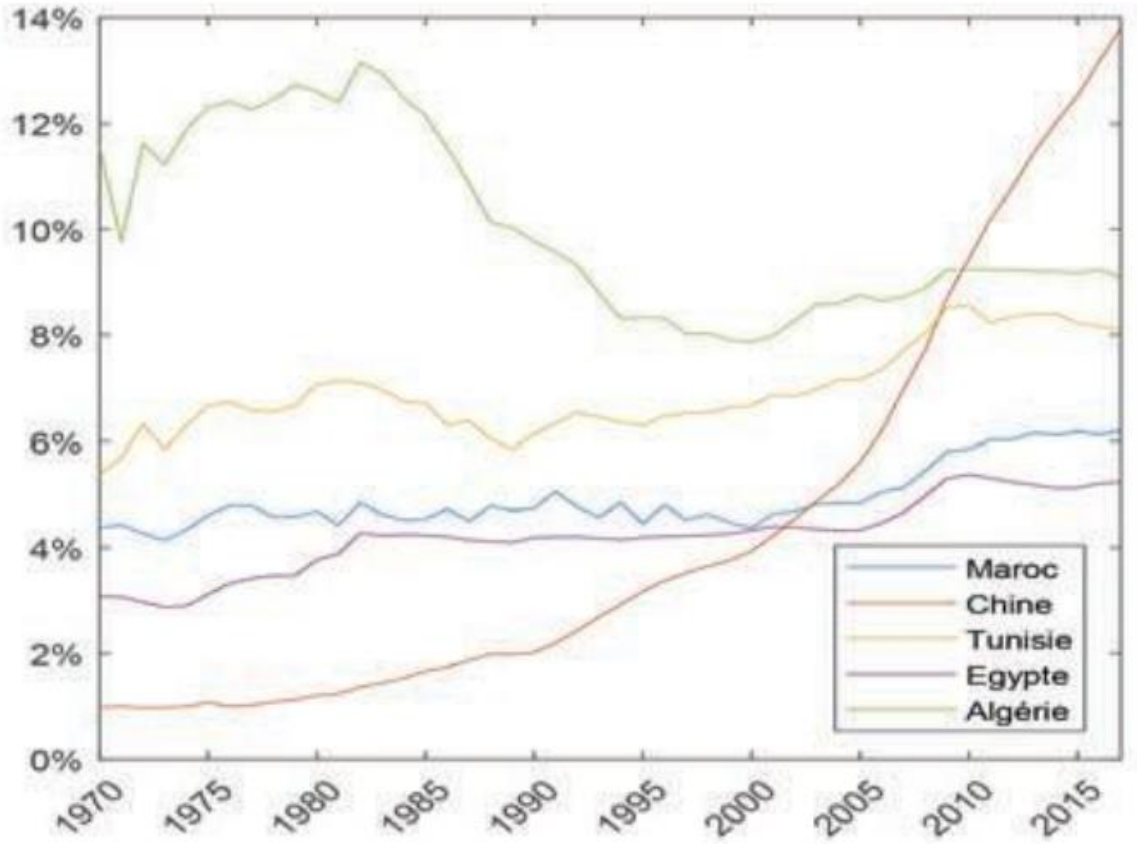
Graph 1: Trends in poverty rates and relative GDP per capita

Evolution of poverty rates

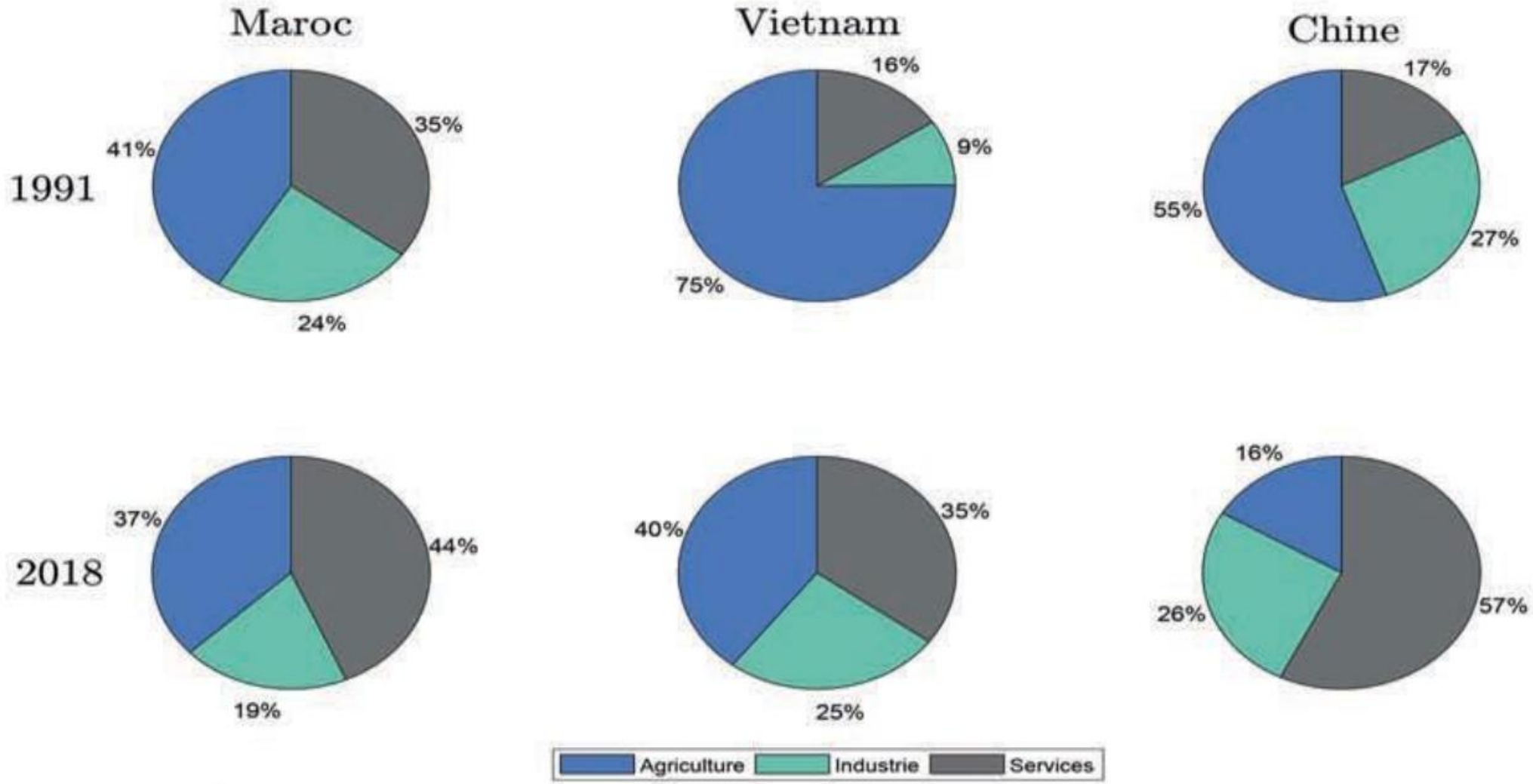


Source: World Bank data

Retention ratios compared to the USA



Graph 2: Structure of the employed labor force by sector (in %)



Source: International Labor Office data

The calculation of the economic complexity index is based on the matrix M_{cp} which is given for a country c and a product p by:

$$M_{cp} = \begin{cases} 1 & \text{si } RCA_{cp} \geq 1 \\ 0 & \text{sinon} \end{cases}$$

RCA refers to the revealed comparative advantage of a country over a given product defined by Balassa (1965) as follows:

$$RCA_{cp} = \frac{\frac{X_{cp}}{\sum_c X_{cp}}}{\frac{\sum_p X_{cp}}{\sum_{c,p} X_{cp}}}$$

From the M_{cp} matrix Hausmann, Hidalgo, and al. (2014) define a recursion to calculate the economic complexity index:

$$k_{c,N} = \frac{1}{k_{c,0}} \sum_p M_{cp} \cdot k_{p,N\ 1} \qquad k_{p,N} = \frac{1}{k_{p,0}} \sum_c M_{cp} \cdot k_{c,N\ 1}$$

The recursion starts with the calculation of two indicators:

$$\text{Diversité} = k_{c,0} = \sum_p M_{cp} \qquad \text{Ubiquité} = k_{p,0} = \sum_c M_{cp}$$

Intuitively, the economic complexity index is a measure that is based on the reciprocal correction of the information contained in the diversification of countries and the ubiquity of products.

By stating :

$$\tilde{M}_{cc'} = \sum_p \frac{M_{cp} M_{c'p}}{k_{c0} k_{p0}}$$

The recursion satisfies the equation, $k_{c,N} = \sum_{c'} \tilde{M}_{cc'} k_{c',N-2}$, which is satisfied by, $k_{c,N}=k_{c,N-2}=1$

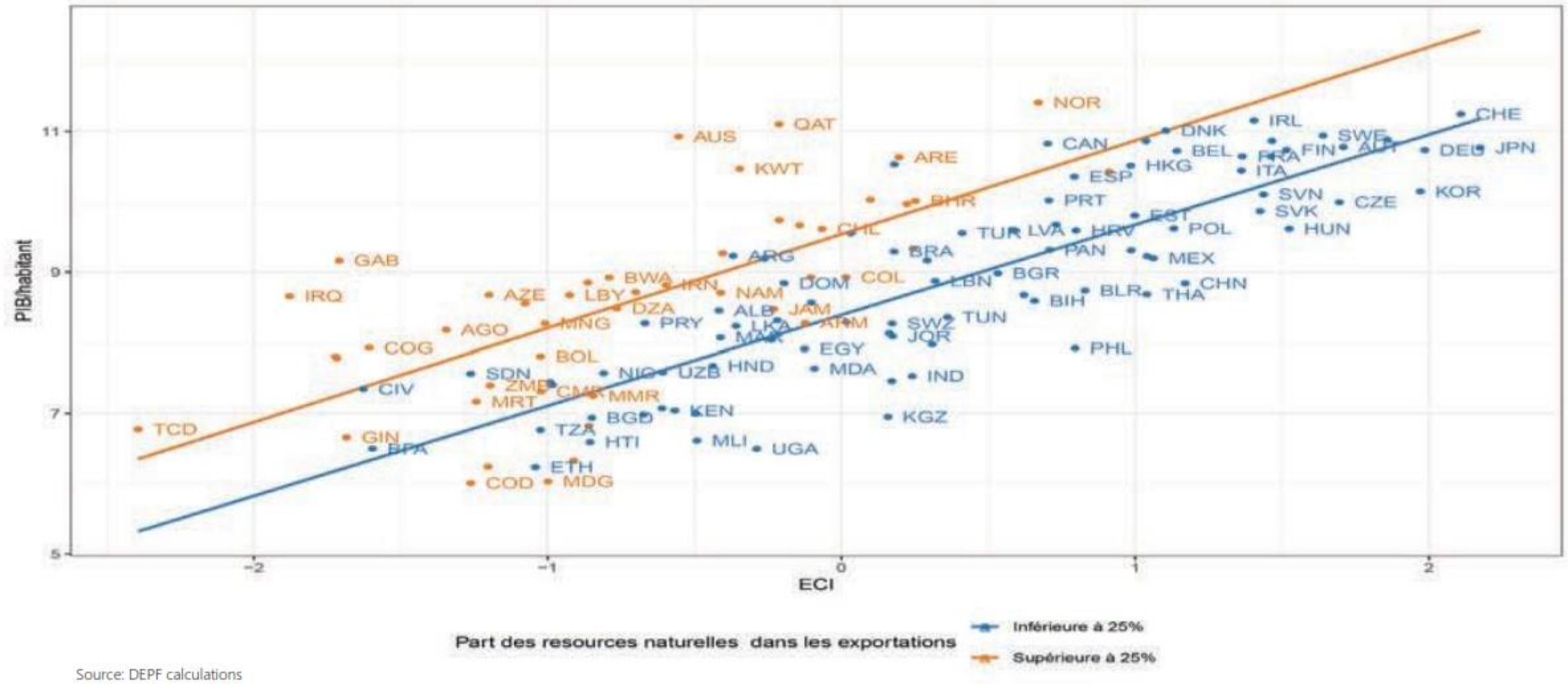
The solution corresponds to the eigenvector of $\tilde{M}_{cc'}$ associated with the greatest eigenvalue. Since this vector is a vector of 1, the ECI is calculated on the basis of the eigenvector **K** associated with the second eigenvalue and then centered and reduced:

$$ECI = \frac{\vec{K} - < \vec{K} >}{stdev(\vec{K})}$$

The product complexity index **(PCI)** is calculated by transposing the matrices, with **Q** the eigenvector associated with the second eigenvalue of the $\tilde{M}_{pp'}$ matrix:

$$PCI = \frac{\vec{Q} - < \vec{Q} >}{stdev(\vec{Q})}$$

Graph 3: Relationship between economic complexity and GDP per capita

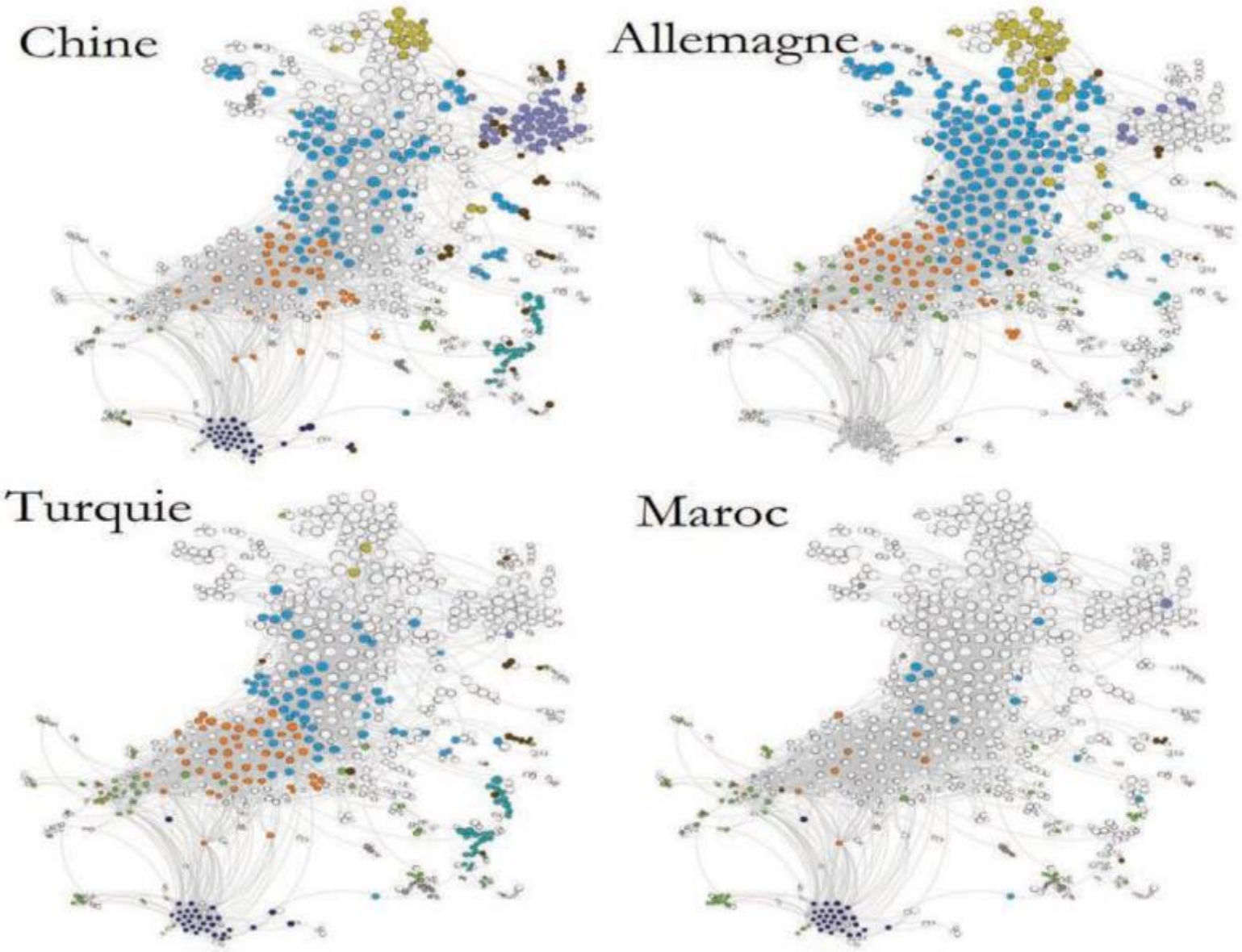


Source: DEPF calculations

Shares of natural resources in exports

Less than 25%
Greater than 25%

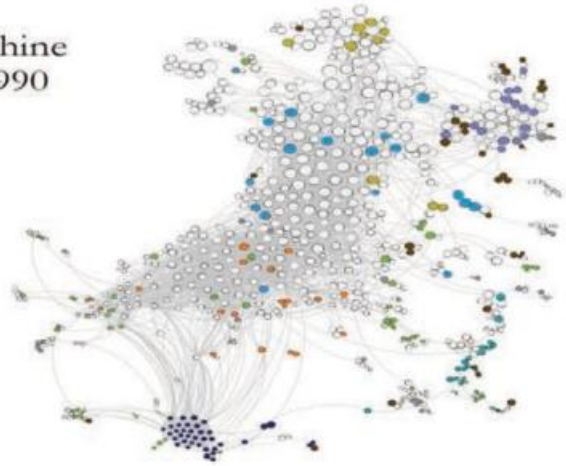
Graph 6: Product space of countries at different stages of development



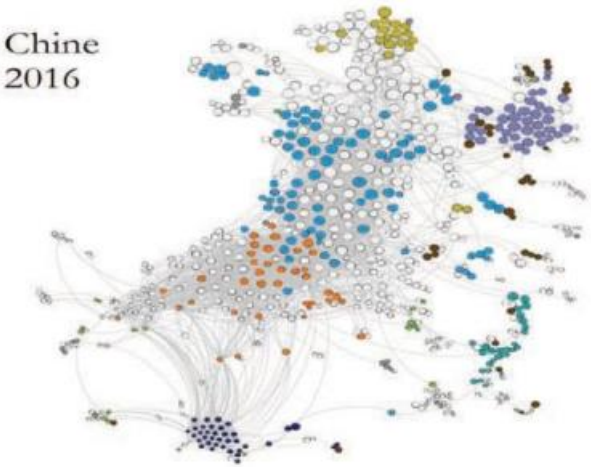
Source: DEPF calculations

China – Germany – Turkey - Morocco

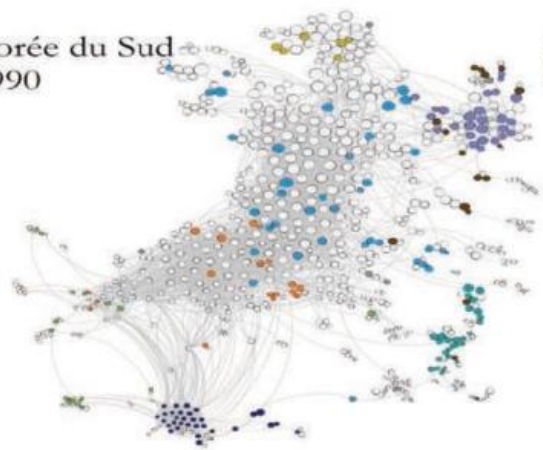
Chine
1990



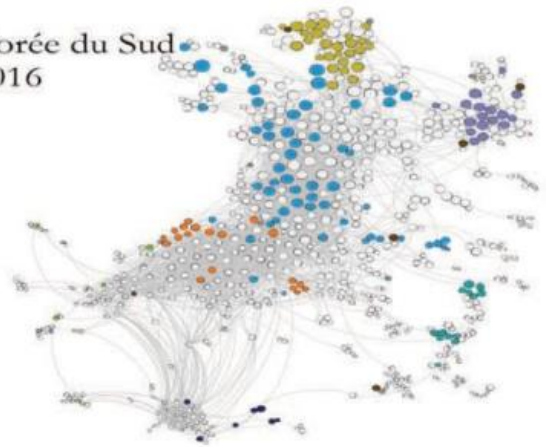
Chine
2016



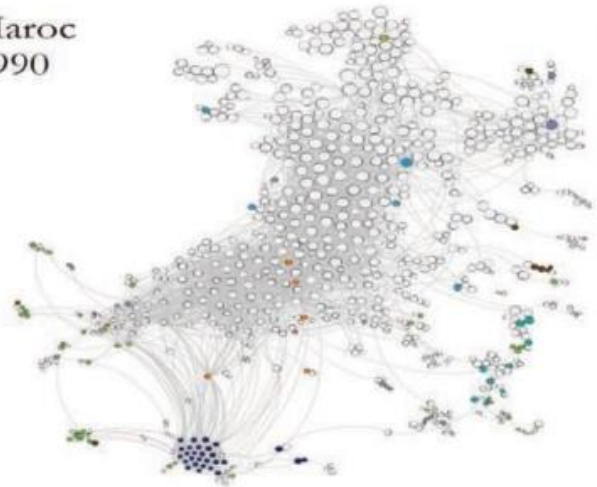
Corée du Sud
1990



Corée du Sud
2016



Maroc
1990



Maroc
2016