



Deliverable 4.1

Agenda on

“Research on

Country/Sector specificity”

This project has received funding from the European Union's Horizon 2020 Marie Curie Research and Innovation Staff Exchange under grant agreement No 778398



Agenda on “Research on Country/Sector specificity”

Months: **M33-M66** – from January 2021 to October 2023

Deliverable: **D4.1** Agenda on “Research on Country/Sector specificity”

Work Package: **4**

WP4 Objectives: The primary objective is the development of new analytical models by specific country/industry case studies that allow policy makers to identify the constraints and the opportunities that GVCs bring to domestic firms and to design ad-hoc interventions that can strengthen their performance.

Participants:

Lead Beneficiary: **UB-ICRIOS**

Other Participants: **NTUA-LIEE; UNU-MERIT; IBS; TUT-RNS; EESC-GEM;**

UCM- ICEI; CDS; UEC-DPCT; UNA-CINPE; UM-MY; TUT-FMS; CEC;

UNIROMA3; UNIDA.

Table of Contents

1. Introduction	3
2. Country/Sector report structure.....	3
3. Catch-Up analysis through Catch-Up Performance Index.....	5
4. Supervisors for each Country-report.....	9

This project has received funding from the European Union's Horizon 2020 Marie Curie Research and Innovation Staff

Exchange under grant agreement No 778398



1. Introduction

This task will identify for each country linked with every PO the sectors that respond to particular characteristics in terms of structure and policy centrality. In order to focus the attention of the research on relevant sectors, this activity will follow a top-down perspective, whereby we will select relevant case studies and interview policy makers, key actors in industries and sectors, relevant decision and policy makers at national and international level. These interviews will allow researchers to optimise the selection of critical case studies and align them with each country's specialisation.

There will be an overall analysis of the country's specific structure, specialization and policy mix. This will allow us to have an optimal representation of the relationship between structure, industrial specialisation and policy orientation. All this, of course, will unfold according to a GVC as the main point of reference and taking into account industrial performance as the specific unit of observation.

From this analysis, it will be possible to define a list of relevant country specific actors to interview according to a specific interview protocol. The structure of this list, as well as the characteristics of its members will be defined by the country's characteristics and maturity level in GVC's policy activities. The objective of this task is to enhance the effectiveness of this RP in terms of the country's innovation and industrial policies design and implementation capability.

This task will identify:

- a. modelling approach, empirical analysis and case study techniques, data organization and indicators of relevant variables elaboration;
- b. data and information that will be collected and entered in the platform for knowledge sharing, enabling partners involved in the following WP5 to have all data and information for the successful implementation of the activity planned.

2. Country/Sector report structure

In order to obtain a homogeneous and comparable analysis of the Countries considered, the following template will be used for each report, entitled "*Catching-Up along the Value Chains in different sectors: BMs, Determinants and Policies for Development – The case of *selected sector* in *selected Country**":

1. INTRODUCTION

- Explain the situation of the selected sector in the considered Country.
- What is catching-up?
- What is GVC (Global Value Chain)?
- Explain the connection between GVC and catching-up approach.

2. OVERALL ANALYSIS OF THE COUNTRY'S SPECIFIC STRUCTURE, SPECIALISATION AND POLICY MIX

- Representation of the relationship between structure, industrial specialization and policy orientation in the considered Country.

3. MODELLING APPROACH, EMPIRICAL ANALYSIS AND CASE STUDY TECHNIQUES

- Data organization and indicators of relevant variables elaboration;
- data and information that will be collected and entered in the platform for knowledge sharing, enabling partners involved to have all data and information for the successful implementation of the activity planned;
- application of “Catch-Up Performance Index” (CUPI) to capture country's economic dynamics.

4. DEEP ANALYSIS OF THE SELECTED SECTOR IN THE CONSIDERED COUNTRY

- Explain the situation of the selected sector in the considered Country before catching-up
- Find drivers of catching-up
- Has innovation contributed to the catching-up of the selected sector in the considered Country too?
- Analyze how these drivers conduct the considered Country to the actual leading role in the selected sector.
- Application of “Sector Catch-Up Performance Index” (S-CUPI) – based on sector's productivity data - to capture the specific sector's dynamics in that country.

5. RESULTS DISCUSSION AND CONCLUSIONS

- Explain lesson learned from the considered Country experience for the others Emerging Countries.

3. Catch-Up analysis through Catch-Up Performance Index

The Catch-Up Performance Index (CUPI) is a quantitative metric employed to evaluate the advancement of a nation in narrowing the income or economic development gap with more advanced economies.

The utilization of an index is prevalent within the realm of economics to assess the extent to which a nation is reducing income disparities or achieving parity with a benchmark country or a set of countries, frequently including the United States.

The main CUPI index is defined as follows:

$$CUPI_{0,T}^i = \ln \left[\frac{rel_y_T^i}{rel_y_0^i} \right] / T \times 100$$

In this formula, $rel_y_T^i$ is the relative difference between the per capita level of income between the emerging country i selected for analysis and US at year T (y_T^i/y_T^{US}), while $rel_y_0^i$ is the same difference but at the base year (y_0^i/y_0^{US}), measured in purchasing power parity (PPP) dollars at constant prices.

By definition, $CUPI_{0,T}^i > 0$ if country is catching up ($rel_y_T^i > rel_y_0^i$), $CUPI_{0,T}^i < 0$ if it is falling behind ($rel_y_T^i < rel_y_0^i$), and $CUPI_{0,T}^i = 0$ if it is neither catching up nor falling behind ($rel_y_T^i = rel_y_0^i$).

So, the CUPI index, in terms of both its sign and magnitude, offers a significant measure for evaluating a country's catch-up performance in per capita income throughout the specified period of analysis.

It is important to acknowledge that the index can be broadly understood as the per capita growth differential between the country under consideration and the United States (Vu and Nguyen, 2022).

In order to conduct a more in-depth analysis, we propose to calculate the considered Index as an average of level and size, in order to obtain an Index of Average Catch-Up and an Index of Average Catch-Up Speed.

The Index of Average Catch-up is formulated to assess the extent of catch-up, while the Index of Average Catch-up Speed is designed to evaluate the rate at which catch-up occurs because the rapidity of catch-up's process holds significance within the context of catch-up itself.

Furthermore, it is imperative to integrate a country's global income share and the rate at which this income share is growing into the calculation of the catch-up index's speed.

There are two fundamental indicators that can be utilized to assess economic conditions with respect to the measurement of these cited new indicators: income level and economic size.

The first one (Income Level) considers the measurement of a country's living standard which is often represented by the Gross Domestic Product (GDP) per capita in real terms, adjusted using Purchasing Power Parity (PPP) to account for differences in the cost of living.

The second one (Economic Size) represents the economic strength and market size of a country which are determined by its present Gross Domestic Product (GDP).

Through this approach, it becomes possible to manage the impact of currency devaluation on the present Gross Domestic Product (GDP) with regards to price competitiveness.

For instance, if there is a 10% devaluation in the national currency and a subsequent 10% growth, the resulting impact on the current GDP in USD would be 0%.

The *Average Catch-up Index* quantifies a country's performance in terms of its ability to achieve both income level and economic size catch-up. The metric is derived from the combination of a level catch-up index and a size catch-up index, resulting in an averaged score.

The income level catch-up index is a metric used to assess a country's per capita GDP in relation to that of a country with the highest per capita GDP in purchasing power parity (PPP), such as the United States. Similarly, the size catch-up index is a measure of a country's share in global GDP compared to that of a country with the biggest share in global GDP, also referring to the United States.

$$\text{Average Catch - Up Index} = \frac{\text{Level Catch - Up } (z_i) + \text{Size Catch - Up } (s_i)}{2}$$

$$z_i = \frac{(y_i - y_{min})}{(y_{max\ USA} - y_{min})} \times 100, \quad y_i = \text{Country } i\text{'s per cap GDP in PPP level}$$

$$s_i = \frac{(x_i - x_{min})}{(x_{max\ USA} - x_{min})} \times 100, \quad x_i = \frac{Y_i \text{ (current country } i \text{'s GDP)}}{\sum_{j=1}^n Y_j \text{ (sum of world' GDP)}}$$

The *Average Catch-up Index Speed* is a metric that evaluates the relative performance of a country in terms of both level catch-up speed and size catch-up speed. The metric is derived by taking the average of a level catch-up speed index and a size catch-up speed index.

The level catch-up speed index quantifies a country's annual growth rate of per capita GDP in purchasing power parity (PPP) relative to the average of a hundred countries.

The size catch-up speed index is a metric used to assess a country's annual growth rate of its GDP share in relation to the global GDP, as compared to the average of 100 nations.

Average Catch – Up Speed Index

$$= \frac{\text{Level Catch – Up Speed } (z_i) + \text{Size Catch – Up Speed } (s_i)}{2}$$

$$z_i = \frac{(y_i - y_{min})}{(y_{max\ USA} - y_{min})} \times 100, \quad y_i = y_i^* - \bar{y}$$

Where: y_i^* is the country i 's GDP growth rate (PPP) and \bar{y} is the average of GDP growth rate (PPP) for sample countries.

$$s_i = \frac{(x_i - x_{min})}{(x_{max\ USA} - x_{min})} \times 100, \quad x_i = x_i^* - \bar{x}$$

Where: x_i^* is the country i 's growth rate of GDP share and \bar{x} is the average of sample countries' growth rate of GDP share.

The two indexes exhibit distinct dimensions of catch-up:

1. Average Catch-up Index measures a country's performance in attempting to narrow the gap between itself and a rival or leading country (e.g. US) in an absolute sense.
2. Average Catch-Up Speed Index, on the contrary, is indicative of a country's rate of change relative to the other countries in the sample. It is a relative index because it is compared with the demeaned growth rate of per capita GDP and GDP share over the world.

Both indices are transformed into a scale that ranged from 0 to 100.

Furthermore, it is possible to adapt these last two average indicators, calculated for each country, to the analysis of the catch-up of a specific sector (S-CUPI) by modifying the parameters considered above as follows:

$$\text{Average Catch – Up Index}_{SEC} = \frac{\text{Level Catch – Up } (z_{i-SEC}) + \text{Size Catch – Up } (s_{i-SEC})}{2}$$

$$z_{i-SEC} = \frac{(L_i - L_{min})}{(L_{max} - L_{min})} \times 100, \quad L_i = \text{sector's country } i \text{ labor productivity}$$

$$s_{i-SEC} = \frac{(x_i - x_{min})}{(x_{max} - x_{min})} \times 100,$$

$$x_i = \frac{S_i (\text{country } i \text{ 's sales volume of sector – market share})}{\sum_{j=1}^n S_j (\text{sum of world sales volume of sector})}$$

$$\begin{aligned} & \text{Average Catch – Up Speed Index}_{SEC} = \\ & = \frac{\text{Level Catch – Up Speed } (z_{i-SEC}) + \text{Size Catch – Up Speed } (s_{i-SEC})}{2} \end{aligned}$$

$$z_{i-SEC} = \frac{(L_i - L_{min})}{(L_{max} - L_{min})} \times 100, \quad L_i = L_i^* - \bar{L}$$

Where: L_i^* is the sector's country i growth rate of labor productivity and \bar{L} is the average of growth rate of labor productivity for sample countries.

$$s_{i-SEC} = \frac{(x_i - x_{min})}{(x_{max} - x_{min})} \times 100, \quad x_i = x_i^* - \bar{x}$$

Where: x_i^* is the country i 's growth rate of market shares and \bar{x} is the average of sample countries' growth rate of market shares.

4. Supervisors for each Country-report

COUNTRY REPORT	EU SUPERVISOR	FOREIGN SUPERVISOR
<i>BRAZIL</i>	Nicholas Vonortas	Yannis D. Caloghirou
<i>COSTA RICA</i>	Jeffrey Orozco	Isabel Alvares
<i>INDIA</i>	Sunil Man	Franco Malerba
<i>MALAYSIA</i>	Baskaran Angathevar	Marek Tits
<i>SOUTH AFRICA</i>	Mammo Muchie	Rasmus Lema
<i>SOUTH KOREA</i>	Keun Lee	Isabel Maria Bodas-Freitas
<i>Quality check</i>		Tarmo Kalvet