

Study on the framework conditions for High Growth Innovative Enterprises (HGIEs): framework conditions selected, measurement, data availability and contingency measures

INNOVA Measure Workshop:
Innovation, high-growth and internationalization of R&D
28th November, 2017

Pedro Costa, INOVA+

Study on the framework conditions for HGIEs

Brief overview of the study

Study on the framework conditions for High Growth Innovative Enterprises (HGIEs)

INNOVA Measure Workshop

Brief overview of the study:

Objective:

The overall objective of the study was to develop a **better understanding of how framework conditions relate to and impact on the development of High Growth Innovative Enterprises (HGIEs), which policies were used to foster their development and how their overall effectiveness can be improved.**

Geographical coverage:

The study includes 37 countries worldwide: the 28 EU Member States plus other selected countries:

- Iceland, Switzerland, Norway and Turkey
- USA, Israel, South Korea, New Zealand and Singapore

Study on the framework conditions for High Growth Innovative Enterprises (HGIEs)

INNOVA Measure Workshop

Brief overview of the study

Objective 1: To obtain a quantitative insight into the **situation of HGIEs on a country level** by providing an up to date and structured set of **quantitative data and indicators** describing specific features relevant for assessing the situation of HGIEs in each Member State

Objective 2: To provide an **analysis of trends and performance differences** between countries as regards such data and indicators

Objective 3: To identify the **most important framework conditions for the development of HGIEs**, at EU level and in each Member State

Objective 4: To get information on the **policies used to foster HGIEs** and how these are evolving

Objective 5: To **analyse possible links between framework conditions, policies and performance patterns at country level.**

Objective 6: To identify **examples of good policy practice** fostering HGIEs

Objective 7: To identify a set of **policy recommendations** at EU and Member State level for improving framework conditions for HGIEs.

Study on the framework conditions for HGIEs

Framework conditions selected

Study on the framework conditions for High Growth Innovative Enterprises (HGIEs)

INNOVA Measure Workshop

Description of the Framework Conditions Selected

- Under the scope of this study, framework conditions were **all the conditions that can shape the context in which enterprises are created and grow over time.**
- **Framework conditions for innovation** are all the conditions that can shape the context in which enterprises innovate and influence also their innovation performance over time and its subsequent market success.
- Framework conditions for innovation can include, for example, public support to R&D activities; labour market regulations; regulations about starting, running or expanding a company; bankruptcy regimes; access to finance from different sources, including private sources; enterprises taxation policies; fiscal incentives to R&D and innovative activities; product market regulations; accessing international markets; higher education systems; existence of specific innovation oriented programmes to support new enterprises and existing enterprises, etc.

Study on the framework conditions for High Growth Innovative Enterprises (HGIEs)

INNOVA Measure Workshop

Description of the Framework Conditions Selected

- In order to carry out the HGIEs Study, 16 Framework conditions were defined within six policy areas adopted from the **OECD-Eurostat Entrepreneurship Indicators Programme (EIP)** and the **NGER model presented in the Nordic Growth Entrepreneurship Review 2012** (Napier et al. 2012): i) Regulatory framework; ii) Market conditions; iii) Access to finance; iv) Creation and diffusion of knowledge; v) Entrepreneurial capabilities; vi) Entrepreneurial culture.
- The selection of the 16 framework conditions associated to the above-mentioned policy areas was based on a joint expert judgement of the most important framework conditions related to HGIEs performance, taking growth and innovation as core and pivotal themes.
- Each framework condition includes one or more **indicators** to help measuring country performance, in a total of **33 indicators** selected on the basis of the following non-exhaustive criteria: availability, ability to capture/measure the framework condition at hand, overall completeness and overlap.

Study on the framework conditions for High Growth Innovative Enterprises (HGIEs)

INNOVA Measure Workshop

Description of the Framework Conditions Selected

Policy area	Framework Conditions	Indicators
Regulatory framework Refers to laws, regulations and other measures in force at regional national or international level that influence business performance, as they set the main lines regulating the business environment. Framework conditions related to regulatory framework include e.g. requirements to start a business, legislation influencing work relations, tax legislation, legal barriers to circulation (of products, services and people), enforcement of justice (courts, control of corruption) and property rights.	Administrative burden	Nº of days for starting a business Cost for starting a business
	Labour legislation	Product market regulation Difficulty of hiring and firing
	Court and legal framework	Regulatory quality Rule of law Control of corruption
	Competition legislation	Legal barriers to entry
	Business and capital taxes	Taxation dividends SME and corporate income revenue
	Property rights and standards	IPR

Study on the framework conditions for High Growth Innovative Enterprises (HGIEs)

INNOVA Measure Workshop

Description of the Framework Conditions Selected

Policy area	Framework Conditions	Indicators
Market conditions Refers to the characteristics of domestic and foreign markets with an impact on the creation and expansion of businesses. Framework conditions in this policy area are related e.g. to the penetration of foreign direct investment, size of markets, easy of trade (in and outside borders) and level of state involvement in the market.	Foreign markets	Foreign direct investment Barriers to foreign direct investment Trading across barriers index
	Degree of public involvement	Legal barriers to entry
	Domestic market	Domestic market size and index

Study on the framework conditions for High Growth Innovative Enterprises (HGIEs)

INNOVA Measure Workshop

Description of the Framework Conditions Selected

Policy area	Framework Conditions	Indicators
Access to finance Assesses the resources available for entrepreneurs to start and grow their businesses. This policy area encompasses items such as access to loans and access to venture capital for the different stages of the business.	Access to debt finance	Easy of access to loans Country credit rating
	Access to venture capital	Venture capital at earlier stage Venture capital at expansion stage Venture capital availability

Study on the framework conditions for High Growth Innovative Enterprises (HGIEs)

INNOVA Measure Workshop

Description of the Framework Conditions Selected

Policy area	Framework Conditions	Indicators
Creation and diffusion of knowledge Related to the ability of diffusing new knowledge created through R&D activities, as well as the availability of new technology in the market. It also relates to the conditions of individuals and firms to access knowledge and technology (e.g. ICT penetration, internet access, e-government, etc.). Includes indicators related to R&D funding (public and private), IDI access, collaboration between business and academia, etc.	R&D activity, technology availability and take-up	Public R&D funding as % of GDP Private R&D funding as % of GDP ICT development index IDI access
	Cooperation among firms	University-industry research collaboration Share of SMEs collaboration with others

Study on the framework conditions for High Growth Innovative Enterprises (HGIEs)

INNOVA Measure Workshop

Description of the Framework Conditions Selected

Policy area	Framework Conditions	Indicators
Human Capital / Entrepreneurial capabilities Refers to the stock of people with capabilities for creating value through new innovative products and for creating and developing businesses. Includes perceived capabilities for entrepreneurship, education attainment and human resources in Science and Technology.	Business and entrepreneurship skills	Perceived Capabilities for Entrepreneurship Individuals' Computer skills
	Technological/ innovation propensity	Adult Population with upper secondary or tertiary education Human resources in science and technology

Study on the framework conditions for High Growth Innovative Enterprises (HGIEs)

INNOVA Measure Workshop

Description of the Framework Conditions Selected

Policy area	Framework Conditions	Indicators
Entrepreneurial culture Refers to how society and individuals perceive entrepreneurship and in which circumstances they consider the possibility of creating a business. Entrepreneurial Intention	Entrepreneurial attitude in society	Entrepreneurial intention

Study on the framework conditions for HGIEs

Framework conditions – Measurement issues

Study on the framework conditions for High Growth Innovative Enterprises (HGIEs)

INNOVA Measure Workshop

Measurement issues

- The data collected was **diversified and therefore not directly comparable**. Some indicators are absolute values, some are percentages or ratios, and others are calculated based on time.
- To make the indicators comparable, they were **converted into index values** (normalized). Each one was normalized by setting the value of the country with the best performance at 1 and the weakest at 0.
- In some cases the best performance is not the “highest score” and the normalization methodology was used in a reverse direction (e.g. indicator “Number of days for starting a business”).
- After normalizing all the indicators in a policy sub-area, **the countries’ scores were determined for each policy sub-area by calculating the average value of the indicators**. This allowed a performance analysis of all the countries in a policy sub-area (between 0 and 1).
- Based on each country’s score for the individual policy sub-areas, a total score of the policy area was calculated as a simple sum of the scores of all policy sub-areas. The countries are ranked accordingly in the benchmark analysis.

Data Sources

Main data sources used:

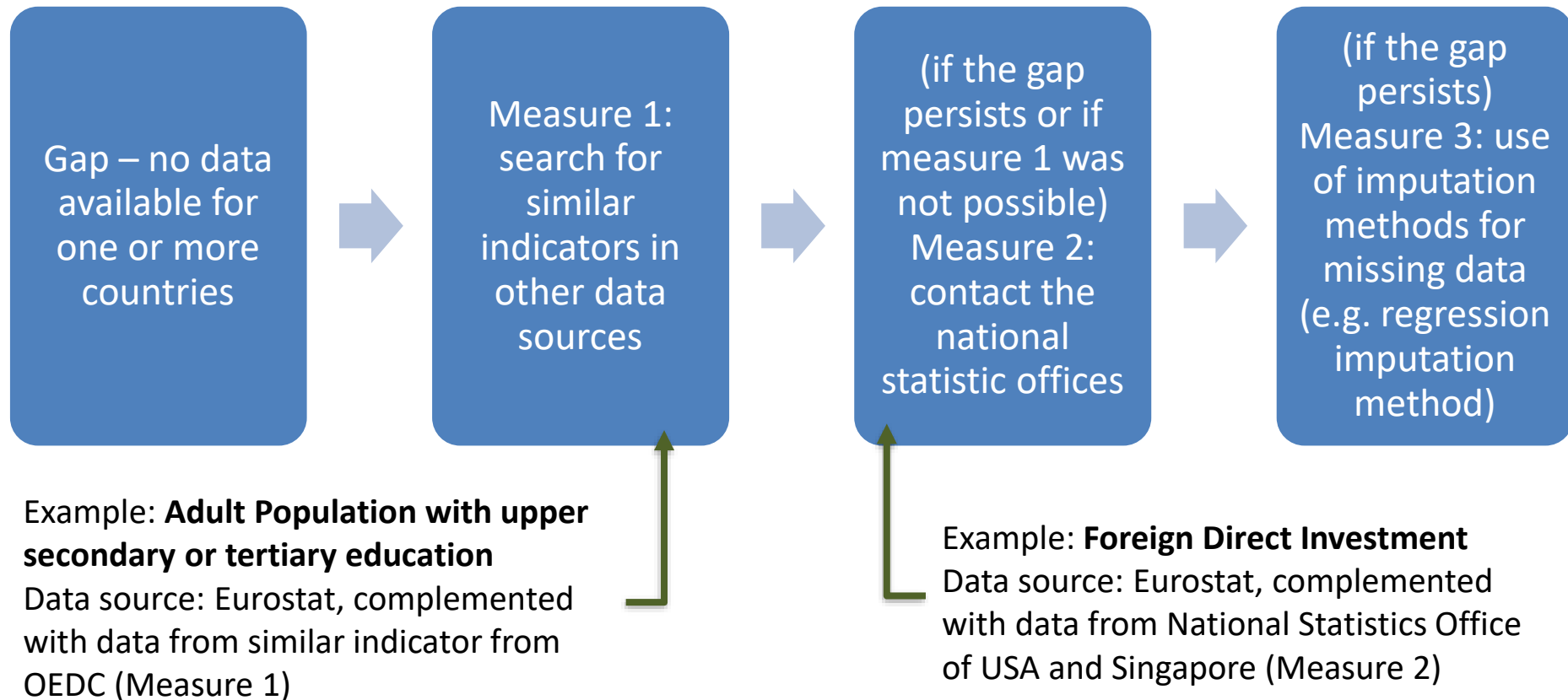
- Eurostat
- OECD
- World bank – Doing business
- World economic forum
- Global innovation index
- CIS Report
- Global entrepreneurship report

GAPS were found on almost all the indicators selected and contingency measures were used to cover the gaps.

Study on the framework conditions for High Growth Innovative Enterprises (HGIEs)

INNOVA Measure Workshop

Data Availability – some issues



Data availability – some issues

- **Some data was not available for all the countries analysed in the period of observation defined (2013-2014) and initial contingency measures did not produced results.** For these situations the following methods for inputting missing data were used:
 - (i) Unconditional median imputation (explicit modelling) where the sample median of the recorded values for the given individual indicator replaces the missing values.
 - (ii) Simple regression imputation where the missing value was replaced by the predicted value obtained from regression.

Study on the framework conditions for High Growth Innovative Enterprises (HGIEs)

INNOVA Measure Workshop

Data Availability – some issues (examples)

Indicator	Product market regulation
Data Source	OECD
The data for this indicator is available every 5 years. The last years available are 2008 and 2013. For the purposes of the study these 2 years were taken into consideration. In this sense, for the year of 2012 we have used the regression imputation method for all the countries under analysis.	

Indicator	FDI – Foreign Direct Investment
Data Source	Eurostat
There is no data available in both years for Norway, South Korea, New Zealand and Israel. To overcome those gaps and input the missing data, the unconditional media imputation method was used.	

Study on the framework conditions for High Growth Innovative Enterprises (HGIEs)

INNOVA Measure Workshop

Data Availability – some issues (examples)

Indicator	Venture Capital at earlier stage
Data Source	OECD

There is no data available in both years for Bulgaria, Cyprus, Croatia, Lithuania, Latvia, Malta, Romania, Iceland, Turkey, Singapore for both years and Estonia, Slovenia and Slovakia for 2012 and Greece for 2013. To overcome those gaps and input the missing data, **the unconditional media imputation method** was used.

Indicator	Perceived Capabilities for Entrepreneurship
Data Source	GEM

There are several gaps concerning the availability of data for this indicator in both years. To overcome them, different input methods were used:

- No data was available for Czech Republic, Italy, Iceland and Croatia for 2012 but it was available for earlier years, the method used for imputing missing data was a simple **regression imputation method** where the missing value was replaced by the predicted value obtained from regression.
- To overcome the gaps in data of the year 2012 for Bulgaria, Cyprus, Luxembourg, Malta and New Zealand, the method used for imputing missing data was the **unconditional media imputation method**.

Data Availability – some issues (examples)

Countries where higher constraints were noticed:

- Greece, even for Eurostat indicators + no answer from the statistical office
- USA, New Zealand, South Korea, Singapore and Israel – for almost all Eurostat indicators, no data was available
- Israel – no answer from the statistics office
- USA – different statistic offices to consult (vary according to the subject) and low response rate



On the opposite: good reaction and collaboration from statistical offices of Iceland, New Zealand and Singapore!

Thanks for your attention!

Final Report study is available at EU Law and Publications webpage

<https://publications.europa.eu/en/publication-detail/-/publication/e326b62f-24cd-11e7-b611-01aa75ed71a1/language-en>

(it includes an annex with country profiles)

Contact:

Pedro Costa: pedro.costa@inovamais.pt

Study on the framework conditions for HGIEs

Countries performance on selected framework conditions

4.2 Framework Conditions performance indicators:

- I. Regulatory framework
- II. Market conditions
- III. Access to finance
- IV. Creation and diffusion of knowledge:
- V. Entrepreneurial capabilities:
- VI. Entrepreneurial culture

This section of the report presents a summary of the key findings regarding the countries' performance on framework conditions. It does not link to performance on HGEs/HGIEs – this is done in chapter 5 of the report.

Study on the framework conditions for High Growth Innovative Enterprises (HGIEs)

INNOVA Measure Workshop

4.2 Framework Conditions performance indicators:

Main findings:

- General overview

- Overall, all countries performance on framework conditions stands below 4,00 (out of a maximum of 6,00), suggesting that there is room for improvements in the different policy areas in all the countries involved in the analysis.
- The EU-28 average performance result in framework conditions is negative in both years of analysis (2,90 in 2012 and 2,84 in 2013) and always lower than the average result of the other (non-EU) countries involved in the study.
- Poorest performances at EU-28 level are noticed in policy areas III. Access to Finance, IV. Creation and Diffusion of Knowledge and VI. Entrepreneurial culture.
- Countries outside the EU-28 show better performance in the policy areas I. Regulatory Framework, III. Access to Finance and IV. Creation and Diffusion of Knowledge.

Policy areas with higher performance

EU-28	Other countries
I. Regulatory Framework	I. Regulatory Framework
V. Human Capital / Entrepreneurial Capabilities	III. Access to Finance
	IV. Creation and Diffusion of Knowledge

Study on the framework conditions for High Growth Innovative Enterprises (HGIEs)

INNOVA Measure Workshop

4.2 Framework Conditions performance indicators:

Main findings:

- I. Regulatory Framework

- Policy area where EU-28 countries perform at a higher level, but still below the performance achieved by the other countries involved in the study. Estonia, Finland and the United Kingdom are the top performers.
- Some countries outside the EU-28 are performing exceptionally, such as New Zealand and Singapore.
- Bulgaria, Poland, Greece and Italy showed the highest improvements in performance over time (but not always sufficient to overcome the poor performance level) .

I. Regulatory Framework

Top performers	Low performers
Estonia	Greece
Finland	Hungary
The United Kingdom	Croatia
Denmark	Italy
Luxembourg	Malta

Study on the framework conditions for High Growth Innovative Enterprises (HGIEs)

INNOVA Measure Workshop

4.2 Framework Conditions performance indicators:

Main findings:

- II. Market Conditions

- A negative performance is seen among the EU-28 countries (on average) in both years, despite a slight improvement from 2012 to 2013.
- Significant improvement is seen in 2013 in countries outside the EU-28. This can suggest that market conditions in these countries are more favourable than in the EU-28 countries
- Only two EU-28 countries (Germany and the United Kingdom) present a remarkable performance.

II. Market Conditions

Top performers	Low performers
Germany	Cyprus
The United Kingdom	Croatia
The Netherlands	Luxembourg
Poland	Slovenia
Czech Republic	Bulgaria

Study on the framework conditions for High Growth Innovative Enterprises (HGIEs)

INNOVA Measure Workshop

4.2 Framework Conditions performance indicators:

Main findings:

- III. Access to Finance

- Policy area where the EU-28 countries present the poor average performance (below 40% of the maximum performance) in both years and well below the average performance of the other countries involved in the study.
- Only Sweden, Finland and Luxembourg perform at a good level, and only these three countries and the Netherlands perform positively in both years.
- It seems that the conditions for access to finance in most of the EU-28 countries present large constraints and stand below practices of other reference countries, such as the United States, Norway, Singapore or Israel.
- Only Sweden presents a remarkable improvement of its conditions in this policy area, while Ireland and Estonia present smaller progresses.

III. Access to Finance

Top performers	Low performers
Sweden	Greece
Finland	Croatia
Luxembourg	Spain
The Netherlands	Italy
Belgium	Portugal

Study on the framework conditions for High Growth Innovative Enterprises (HGIEs)

INNOVA Measure Workshop

4.2 Framework Conditions performance indicators:

Main findings:

- IV. Creation and diffusion of knowledge
 - Also in this policy area the average performance of the EU-28 countries is poor in both years and below the average performance of the other group of countries and with a negative progression over time.
 - There is room for improvements also in this policy area and inspiration can come from good performers outside the EU-28, such as Norway or South Korea.
 - However, the United Kingdom, Finland and Sweden, despite some regression in their performance in 2013, reach very positive performance and well above the EU-28 average result.

IV. Creation and Diffusion of Knowledge

Top performers	Low performers
The United Kingdom	Romania
Finland	Bulgaria
Sweden	Italy
Belgium	Poland
Denmark	Slovakia

Study on the framework conditions for High Growth Innovative Enterprises (HGIEs)

INNOVA Measure Workshop

4.2 Framework Conditions performance indicators:

Main findings:

- V. Human Capital / Entrepreneurial Capabilities
 - A positive (although moderate) average performance of the EU-28 countries is seen in this policy area.
 - However, this average performance is higher than the average result of the other countries included in the study, which present a negative average performance in this policy area.
 - The Netherlands, Sweden, Germany and the United Kingdom are the top performers and can inspire other EU-28 countries.
 - Outside the EU-28 and despite the lower performance, there are some countries performing well such as Norway, Iceland or Switzerland.
 - Three EU-28 countries show significant improvements in this policy area: Croatia, Denmark and Romania,

V. Human Capital / Entrepreneurial Capabilities

Top performers	Low performers
The United Kingdom	Malta
Netherlands	Romania
Sweden	Italy
Germany	Portugal
Belgium	Spain

Study on the framework conditions for High Growth Innovative Enterprises (HGIEs)

INNOVA Measure Workshop

4.2 Framework Conditions performance indicators:

Main findings:

- VI. Entrepreneurial Culture
 - The sixth policy area shows a large tendency for poor performance both for the EU-28 countries and for the other countries involved in the study.
 - The average performance result at EU-28 level is negative in both years and the average performance of the other countries under analysis does not differ.
 - Eastern countries such as Romania, Latvia and Lithuania are performing at positive and higher level
 - Outside the EU-28, only Turkey and Israel show positive performances.
 - Considering progression on the performance, Denmark, Ireland and Italy are showing the most significant improvements in their performance.

VI. Entrepreneurial Culture

Top performers	Low performers
Romania	Germany
Latvia	Italy
Lithuania	Finland
Croatia	The United Kingdom
Estonia	Belgium