

Innovation input and output.

Ladies and gentlemen

Thank you for inviting me to speak at this conference. It is an honor.

I have been in connection with the innovation system in Iceland and Sweden since 1996 through the inventors associations in both countries. It has worried me how the government in both countries have relied on innovation from the universities and most of the financial support goes to them.

Recent data from Dr. Christian Sandström shows that only 20% of innovation in Sweden comes from the universities.

There is no equals between education and innovation, or to be inventive.

People with no higher education can be more creative and inventive than doctors from the universities.

Even children can see opportunities for new products or inventions where we grownups didn't see.

Do we have any data on innovation input and output?

Is there an opportunity for IFIA to step in and collect data from its associations?

In this lecture I will talk about :

- What is already done – reports
- Closer look at GEM and IUS 2015
- Opportunity for IFIA – questions to be asked
- Conclusion
- References

Annually a number of international institutes publish data on innovation.

- Innovation Union Scoreboard from EU is one of them. The goal is to see how innovation friendly each member state is.
- WIPO and INSEAD (Business school of the world) is part of the The Global Innovation index and
- OECD makes its own report.
- GEM, Global Entrepreneurship monitor is also one annual report measuring amount of companies in each country.

All of these reports show facts and figures on the status of innovation and innovative growth in each country. They use number of so called indicators:

- Innovation Union use 25 indicators
- The Global Innovation Index use 21 different indicators
- OECD use 260 indicators
- GEM use standard questionnaire each year, sent to at least 2000 adults (> 18 years) and to experts in each countries. 25% of them must be entrepreneurs and 50 % must be professionals. The data is used to explain the relationship between entrepreneurial activity and national economic growth. It also identifies the factors which encourage and/or hinder entrepreneurial activity and also to guide formulation of effective and targeted policies aimed at stimulating entrepreneurship.

Closer look at the GEM 2014.

The reasons for the establishment of a company may vary by countries,

- it can be factor - driven economies, how much primary goods account for total export, characterized by low-skilled labor and the export of natural resources like in Africa

- efficiency – driven economies, have to show intensity as a major development like China, Latin America and Eastern Europe

- innovation – driven economies, characterized by the production of new and unique goods and services like Sweden, US, EU and South Korea

The entrepreneurial attitude, activity and aspiration are all components who produces innovation, economic growth and job creation.

The entrepreneurial attitude include :

- how many recognize business opportunities

- how many believe they have skills and knowledge

- how many have fear of failure

Entrepreneurial activity includes if it is driven by opportunity or necessity.

Entrepreneurial aspiration is addressing those who

- expect to create jobs

- to be involved in international trade

- to contribute to society by offering new products and services.

It is important to foster positive attitude toward entrepreneurship to affect those individuals who might wish to start a business.

Cultural differences and business-cycle patterns are important explanation for differences in perceptions across countries.

Sweden rank highest, 70% of the innovation driven countries (US, UK, Canada Switzerland, Singapore and the Nordic countries) of opportunity to start a business, but lowest in Singapore 16.7%.

Fear of failure is lowest in Switzerland 29%, highest in Italy 49.1%.

Only 5.9% of individuals in Germany expect to start a business, 12.1% in US , 14.2% in France and 8.5% in Sweden.

The motivation for starting a business differ vastly across the globe.

- Necessity-driven business is highest in Belgium 30%, but lowest in Norway 3.5%, and it indicates that there were no better option for work

- Driven opportunity business is highest in Singapore 70.8%, lowest in Austria 37.4%, and it indicates that the individuals see an opportunity to improve their living, either by earning more money or being more independent.

Financial difficulties and unprofitable business was the main reasons for closing a business. On average one of five entrepreneurs stopped their business due to personal reasons.

There is a global trend that the number of females engaged in entrepreneurial activity is much lower than men in most countries except Switzerland, where it is almost equal, in Sweden the female-to-male ratio is 1:2. In Switzerland they have since 2003 expanded social support system and encouraged acceptance and promotion of women as entrepreneurs, with this good results.

Entrepreneurship is playing a vital role in economic development. It contributes to creating new jobs. Unemployment rate among young people in EU is 22-24%. There is a low entrepreneurial activity among young people, like in Switzerland only 2-4%, despite the good economic condition. In my opinion young people newly graduated can not afford to start a business and to have no income for months like many inventors experience when they are trying to get a new product on the market.

Some say: “Innovate or Evaporate” because:

- life-cycle of products is shrinking and
- time to market is decreasing
- internationalization is major factor of growth and is most important for countries with small domestic market.

The features that are expected to have significant impact on inputs and outputs of entrepreneurial activity are:

- Finance – availability of financial resources for SME’s
- Government policy – support, taxes, regulations
- Government entrepreneurship programs assisting SME’s
- Entrepreneurship education and training in primary school and higher education
- R&D transfer – the extent to which national research and development will lead to new commercial opportunities and is available to SME’s
- Commercial and Legal Infrastructure – institutions that support or promote SME’s
- Physical infrastructure – communication, utilities, transportation, land or space – at a price that does not discriminate against SME’s
- Entry regulation – market dynamics (change in markets from year to year) and market openness (the extent to which new firms are free to enter existing market)
- Cultural and Social norms – who encourage or allow actions leading to new business methods or activities that can potentially increase personal wealth and income.

Experts see huge potential areas of improvement, especially in changing mind set towards becoming more risk taking and the developing a society that encourages entrepreneurship, despite the risk of failure. It is suggested that the culture of “celebrating failures” should be instilled so that failure is seen not as the end of everything but as a good chance for a second try.

One of the key purposes of GEM is to provide reliable data on entrepreneurship that will be useful over time in making meaningful comparisons, both internally and between economies.

If we look closer at the measurement framework of the Innovation Union Scoreboard 2015 we see that The innovation performance is divided in three indicators:

1. **Enablers** – capture the main drivers of innovation performance external to the firm
2. Firm activities – capture the innovation efforts at the level of the firm
3. Outputs – capture the effects of firm’s innovation activities

Enablers includes:

- a) education system, human resource – new doctorate graduates
how many aged 30-34 with tertiary education
Youth with at least secondary education
- b) research system – international scientific co publication
top 10% most cited scientific publication
non-EU doctorate students
- c) finance and support – R&D expenditure in the public sector
venture capital investments

2. **Firm activities** – capture the innovation efforts at the level of the firm

- a) investments – R&D expenditure in the business sector

Non R&D innovation expenditure

- b) entrepreneurship and networks – SME's innovating in-house
 - Innovative SME's collaborating with others
 - public-private co-publication
- c) Intellectual assets – PCT patent application
 - PCT patent application in societal challenges
 - community trademarks
 - community designs

3. **Outputs** – capture the effects of firm's innovation activities

- a) Innovators – SME's with product and process innovation
 - SME's with marketing or organisational innovations
 - Employment fast-growing firms of innovative sectors
- b) Economic effects – Employment in knowledge-intensive activities
 - medium & high tech product exports
 - knowledge intensive services exports
 - sales of new to market and new to firm innovations
 - license and patent revenues from abroad

The data source comes from OECD, World Bank, United Nations and Eurostat.

Member states are classified into 4 performance groups based on their average innovation performance:

- Innovation leaders – Sweden, Denmark, Finland, Germany
- Innovation followers – UK, Slovenia, France, Austria... (close to EU average)
- Moderate Innovators – Estonia, Hungary, Italy, Slovakia, Poland, Portugal ...(lower than EU)
- Modest Innovators – Latvia, Romania, Bulgaria

If we look at other countries in Europe we see that Switzerland is the best performer of innovation, Iceland is an innovation follower, Norway and Serbia is moderate innovators and Macedonia and Turkey are modest innovators.

Sweden has the best performing innovation system in the EU, followed by Denmark, Finland and Germany. They have balanced innovation system with strength in all dimensions.

Estonia, Denmark, Finland and Sweden perform best in finance and support of innovation.

Ireland, Denmark and Luxemburg reach the highest result in economic affects and the innovation leaders (SW, F, DE, G) reach the top in intellectual assets.

The gap between the Member states closes slowly by time, but innovation activities has decreased in EU and it can be the result of the economic crises.

Internationally South Korea, US and Japan are top global innovators in indicators capturing business activity (R&D expenditures, co-publication and PCT patents) and education (tertiary)

China and South Korea are the fastest growing performers of innovation, globally.

When you look at the scores in the Innovation Union Scoreboard then you can see that countries ranks high if :

- the national education is advanced and generating new doctorate graduates
- the countries scientists paper are widely published
- high expenditure on R&D
- accessible venture capital.

Unfortunately these annual reports are almost solely quoted from the “input” charts but very seldom by outputs.

But the most important thing to measure is what comes out from the investment in education and innovation, in the form of tradable products and technologies. Don't you agree?

The primary task of Universities is to produce knowledge, by theories and methodology, but not to teach inventive thinking. Scientists gain more respect from the society by publishing papers then to produce new products on the market. There is also a gap at the Universities between departments and there should be a link between science, technology and business. There is a lack of motivation at the Universities to bring products on the market who might be the outcome of R&D.

What is interesting regarding Sweden which has the best performing innovation system in EU It is among the lowest of the 27 EU states when it comes to innovation growth, only 0.34% but Latvia is growing 3.39%

Turkey's innovation growth is topping in Europe's countries by 6.98%

Several of the leading countries hold high scores on the “input” charts but perform average or not very good in results of new products, new businesses or lower unemployment.

So there seems to be no direct connection between input and output.

Opportunity for IFIA.

In my opinion, and others, there is an opportunity for IFIA to step in and take a position as an international data provider alongside with the OECD, The Global Innovation Index and Innovation Union Scoreboard.

IFIA represent 64 countries and more than 110 inventors associations.

Therefore it could present facts about innovation output (new products and new jobs and new SME's) since the organisations represent the majority of inventors and innovators in each country.

The Swedish report “Where did Sweden's 100 most leading innovation come from”? that was represented yesterday by Dr. Sandström is sufficiently indicative, to warrant further work to clarify how innovation policies can be improved, in favour of general innovation or industrial growth.

IFIA could and should be the information provider at least every other year.

Broadening and deepening IFIA's knowledge on the potential and productivity of inventors and innovators would be most valuable for the IFIA's member countries.

How could such a questionnaire possibly be?

We need to know:

- age
- gender
- level of education
- immigrant background
- type of innovation
- number of innovation
- number of patents
- quantity and origin of finance support
- distribution and type of innovations across geographic regions.

Conducting such a survey in IFIA's member countries poses a challenge to see different conditions in each country, regarding:

- administrative resources
 - logistics costs
 - cultural differences
 - political and regional divergence
 - number of patents
- among other things.

It would be very valuable for all of us if IFIA could establish such knowledge.

I know from my innovative members in Iceland that :

- the financial support for innovation is too little and limited,
- the application process is too complicated and the application dates too few
- there are many workshops to start a business for inventors
- but few innovation products are successful on the market
- many inventors lose their passion for their innovation and give up, because they have to get a paid job.

It is mine and others' beliefs that IFIA and their members would gain visibility, attention and respect if it could gather information of innovation like one of the major global organisations.

Conclusion.

- GEM and IUS give similar results regarding innovation leading countries
- No direct connection between Education and innovation
- No direct connection between Input and output
- Opportunity for IFIA to gather valuable information from members(inventors and innovators) and gain visibility, attention and respect.
- Celebrate failure:

"If you're not failing every now and again, it's a sign that you're not doing anything very innovative"
says Woody Allen

THANK YOU!

Referenses:

- Global Entrepreneurship Monitor 2014, London Business school
- Innovation Union Scoreboard 2015, EU commision
- Var skapades Sveriges 100 främsta innovationer by Dr. Christian Sandström, Chalmers tekniska högskola
- Global Innovation Index 2014, by WIPO, INSEAD and Johnson Cornell University