

## Panel: On Innovation Policies for Developing Countries

June 9th 2005, at Universitat Pompeu Fabra, in Barcelona.

**Moderator:** William F. Maloney, World Bank

**The Panel consisted of:**

Bronwyn Hall, UC Berkeley, On Public Financing of Innovation

Jan Fagerberg, University of Oslo, On Capacity Competitiveness

Manuel Tajtenberg, Tel-Aviv University, On Government Support to R&D and the role of VC

### Summary

*Bronwyn Hall, UC Berkeley*

Professor Bronwyn Hall talk was on public funding of innovation in developed countries with a particular focus on Latin American ones. Problems that arise are R&D industry underinvestment, low government support for R&D and the presence of lower quality public sector research institutions with weak links to industry.

Under investment in Latin America is caused by low financing and high entry barriers. This last problem is very hard, just consider that to set a firm in Argentina costs four times more than in Malaysia even if these two countries have more or less the same GDP.

In the economic literature the optimal subsidy is calculated considering the difference between the optimal social level and the optimal competitive level of R&D. This simply derives by the comparison of the R&D cost and the R&D private and social returns. However, Hall brings in evidence some difficulties with this calculation since the magnitude of the spillover gap varies very much. It varies by country since they differ for development and openness degree, by industry since appropriability is industry-specific and by technology type since technology can be generic or specific.

Different remedies to encourage private sector R&D are considered. Tax-credit, that is becoming more and more popular, is mainly characterized by the firm's choice of the project. The problem of this policy is that it is an expensive instrument unless it is done incrementally (but doing this is very difficult). Subsidy-policies, instead, are targeted to collaborative research among university-industry or government-industry. In this case, it is the government that freely chooses the project to subsidize. This last policy has been successful in many developed countries and it is particular suitable in the early stages of development. Policies that, instead, seem to have not worked well are the creation of a VC industry and the FDI enhancing through low taxes, duties, trade zones with no provision of transfer activities. Some doubts also arise on Intellectual Property Rights policies since there are successful innovation stories even in their absence. Finally the speaker strongly believes in imitation as a way to learn.

*Jan Fagerberg, University of Oslo*

The second speaker, Professor Fagerberg, gave a talk on knowledge creation, knowledge exploitation and the global economy.

There is a very clear distinction between "catching up" countries and "falling further behind" ones. The former include all the new EU members, three Asian countries (China, Korea and Malaysia) and Chile. Some European countries (Belarus, Russia, Ukraine and Moldova, Bulgaria and Romania) joint with some of the Asian and Latin American countries included in the sample belong to the "falling further behind" group.

The author, in his joint work with M. Srholec and M. Knell, explains different growth rates using potential catch-up and competitiveness of each country. In particular, he identifies the crucial competitiveness factors behind such country growth-differential: technology, capacity, price and demand competitiveness.

Technology competitiveness is measured with R&D expenditure, numbers of patents, number of publications and a measure of ICT in each country; proxies for the capacity competitiveness are instead education, financial system and governance; price competitiveness is measured by growth in unit labour cost and demand competitiveness by growth in world demand weighted by export composition. Econometric results strongly suggest the relevance of technology competitiveness in explaining growth divergence among countries.

Deteriorating in capacity competitiveness, on the other hand, is one of the main factors at work in the catch-up process of new EU members. Demand competitiveness, instead, seems to be the main explanation for “Asian tigers” success.

Government policies implications are also discussed. An analysis on the factors behind the observed changes over time in technology and capacity competitiveness reveals that differences across country groups are striking. Differences in innovation between countries are mostly based on different investment on ICT. R&D differential, instead, seems to play a minor role. Along the capacity dimension, there is some catch up along one dimension, human capital, particularly by the new EU members, and the developing countries in Asia and Latin-America. Sub-Saharan African countries could be, instead, the potential losers in the catch-up process if their government don't take actions to improve both technological and capacity competitiveness.

*Manuel Tajtenberg, Tel-Aviv University*

The third presentation was done by Professor Trajtenberg. He recalled that the rationale for the government support of R&D relies on the fact that social innovation returns are higher than private ones, so R&D expenditure is subject to underinvestment. Governments in developed countries support basic research, higher education, defence-related R&D, health care-medical R&D using different policies like tax incentives, grants, conditional loans, incentives for technology transfer and jump-start VCs.

Even if the emerging view considers innovation policy and R&D incentives as a necessary condition to reach higher growth performance, Trajtenberg exposed his scepticism about this. Many questions need to be answered and economic literature should fill some important gaps in explaining the mechanisms that link R&D and growth. Some of these regards the role of “absorptive capacities”, the kind of innovations that has stronger impact on TFP, the difference in the R&D-growth mechanisms between less and more developed countries. The case of Israel, one of the most innovative countries nowadays is a good example to motivate his sceptic view.

In 1970's Israel had little resources but highly skilled manpower. Government sustained a “science-based” sector with policies characterized by a strong connection with market signals and dynamisms in terms of the variety of offered programs. Even if R&D indicators in the last decade perform very well (ICT production, patents per capita, number of major innovations are all very high), there isn't a clear indication of a sustained growth: disparities between ICT sector and the rest of the economy are very strong and the socio-economic inequality is rising. The first effect puts in evidence the existence of a dual economy that doesn't grow as a system while the second effect is negative for the future, since it works in the direction of reducing future human capital.

Thus it seems that Israel doesn't manage to fully appropriate of all the benefits its innovation creates. This happens because the country exports its innovations generating internal spillovers only at some extent. Moreover there are few Israeli-based corporations and R&D labs belong mostly to multinationals that absorb local talent transferring the benefits elsewhere.

Trajtenberg suggests many points to think at when one considers innovation policies. First, policies that enhance only one “high tech” sector could be limitative if they don't affect other, maybe stagnant, sectors. Second, heterogeneous needs should be considered when we want to accommodate innovations to different markets. Third he puts in evidence the importance of the local demand in the failure of innovation policies. Fourth, each policy works if other conditions are true, thus the same policy can perform differently in asymmetric situations. He suggested to create an information pool of failed project and to prolong life of before-last generation products to diffuse ICT in LDCs.

## **Discussion**

An animated discussion followed the three panel interventions. Questions regarded the incentive structure needed in LDCs to reach institutions for policy formation and university collaboration; differences between creation and transfert cost and instruments to better promote transfert and adoption of new technologies; suggestion for Israel to benefit of its innovations trickling them down to the rest of the economy; the role of local demand in the appropriation of innovation benefits; the role of failure in knowledge contribution.

Different participants recalled that in Latin America a lot of innovation can be done at corporate level, and that the large demand market should be a resource to exploit. As regard the difference between

creation and transfer costs Hall told that there are lot of unused data on this topic coming from innovation service.

Some suggestions emerged for the Israeli case: to skip the multinationals intermediation in innovation exports and to incentive mergers and acquisitions inside the country. Trajtenberg also noticed that the failure at work in the Israeli case could be an informational one. Participants didn't fully agree on the track of failure proposed by Trajtenberg, while recognized the importance of the issue.