

## Towards a consensual innovation strategy in the US

**Since 2005, the Board on Science, Technology, and Economic Policy the National Academies (STEP), has carried out a broad survey of possibilities to improve innovation policy of the USA. From a European point of view, this work seems to have reached a turning point by establishing a kind of intellectual consensus. But that may be an optical illusion?**

Formally, during the XX<sup>o</sup> century, there was neither industrial nor innovation public policy. It was politically correct to say that market laws were enough to generate and optimize innovation. Nevertheless U.S. is not the world champion of innovation by chance. During the last seventy years, behind the politically correct arguments, we do find a strategy to build the U.S. military and industrial preeminence on a strong scientific strategy and a large public procurement. By now, we can see that the U.S. wants to maintain this leadership, even if it needs a revolution in their mind and in the “politically correct”. History enlightens the present change.

### **US Innovation starts from the beginning of the XIX<sup>o</sup> century**

USA didn't become innovator in one moment in the middle of the XX<sup>o</sup> century. Historians saw an endless improvement of economic efficiency from the XVIII<sup>o</sup>. This increase is first founded on the use of imported technics and innovations. From the beginning of the XIX<sup>o</sup> century, this development model was turned into a local innovations model such as agricultural mechanization with Cyrus McCormick (1809-84), electricity with Thomas Edison (1847-1931) and telephone with Graham Bell (1847-1922).

At that time, the innovative capacity of USA relies on social organization and behavior; there was no innovation policy. The U.S. is innovative because people are innovators and entrepreneurs and because administration didn't seek to constrain or to manage innovators. In 1953, Federal policy established a public procurement dedicated to the SME through the SBA. This “simple” combination of public procurement and entrepreneurship led to two major worldwide references for innovation parks or clusters: the Silicon Valley near San Francisco and Road 128 near Boston.

### **The Key role -although minor- of the federal state after the Second World War**

At that time, when the Federal State is fostering innovation, it feels, thinks and says that it only develops a Government purchasing policy! It also adds a Federal scientific research policy through Agencies. This policy started during the War driven by Vanevaar Bush, the scientific advisor of President Roosevelt. This policy for financing fundamental research labs while large industrial groups finance the development labs, has been the core of the US innovation policy from the end of the war until the 80's.



*Vannevaar Bush in the 40s, as he was the Head of the National Defense Research Committee (NDRC) founded in 1940 by President Roosevelt. He founded Raytheon in 1922*

*source : wikipedia / Library of Congress*

For 70 years, we have seen an increasing number of public funding agencies like NSF (1950) and Tech development agencies like NASA (1958)<sup>1</sup>.

### **1950s, beginning of the federal innovation policy for SME**

Though the Bush system was well working in the 50s, it was clear that the SME were to play a key role in creating jobs<sup>2</sup>. In the Small Business Act of July 30, 1953, Congress created the Small Business Administration. The Small Business Investment Corporations (SBIC) were created by the Small Business Investment Act of 1958. SBICs are privately owned and managed investment funds, licensed and regulated by SBA. These companies can borrow with the SBA guarantee around twice their equity. With the Business Angels, SBICs have been the core of the start-ups financing for nearly 50 years. This policy fueled the US entrepreneurship with a great deal of money and consequently became a key of innovation.

### **The dimly successful local States policies**

Based on the model of Silicon Valley and Road 128, several States tried to develop innovation policies, with scarce successes: Triangle Park in North Carolina is a fair industrial estate, but with no real innovation area; New York city tried to become a digital center but Funds were not successful during the 2000s. Texas really succeeded but only for invention, not for innovation.

In a recent book, Josh Lerner<sup>3</sup> provides a sad picture of these policies and draws two conclusions which have become a part of American consensus:

- States (Federal or local) have a key role in the success, mainly through public procurement.
- Direct involvements of States, in creating Venture Fund for instance, always led to no result (at best)

Founding a new “silicon valley” is the “holy Graal” of any local policy. But this is still a powerful dream that very often turns into dust.

### **The 80s crisis and the Bayh-Dole Act**

At the end of the 70's, offshoring production of brown electronics in Asia was a new evidence. The US answer has been to reorganize the development of microelectronics in USA thanks to a policy combining R&D partnership (Sematech) and Tech Transfer towards SME (Through the Bayh-Dole Act).

In fact, more than ten laws were passed in the 80's including SBIR (Small Business Innovation Research) and STTR (Small Business Technology Transfer), for improving the innovation strength of SME because they are the main engine of innovation.

Finally, we must remember that the « Endaka » (revaluation) of the Yen in the 80's, from 250 to 100 Y/\$ has been a great contributor to rebalancing the US technological trade balance.

### **The 2000s relapse**

During the 80's and 90's, US success in microelectronics, then on the Web and in Biotech has shown the restart of the American innovation machine. Unfortunately, at the beginning of the 2000's, emerging economies led the US to rethink its innovation policy.

In 2004, a committee of the Parliament queried the National Research Council (NRC) of the National Academies for “the ten emergency actions” needed to foster US innovation. Several reports written under the authority of the STEP have progressively changed the way people look on innovation policy and the way of thinking innovation policy established in the 40's.

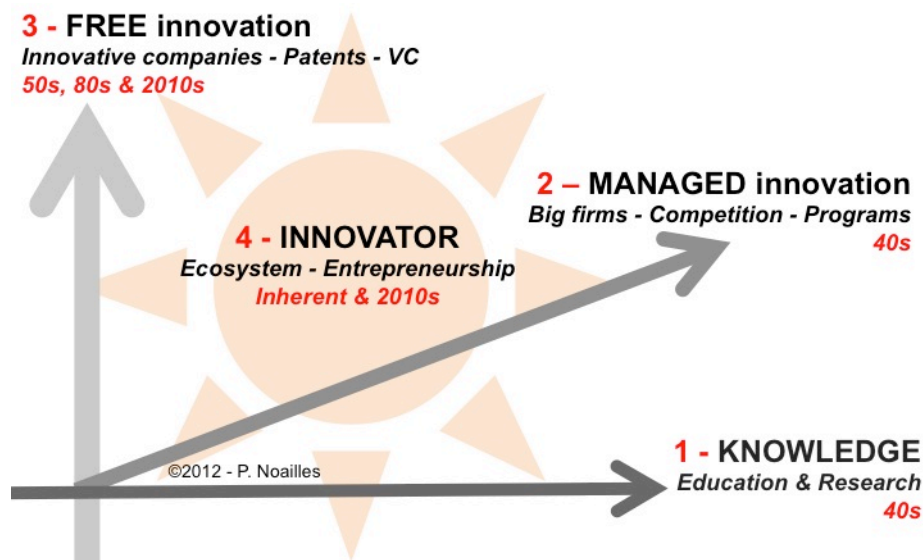
Simultaneously, it has been shown that entrepreneurship results from immigrants and that immigration policy for graduates was a major part of entrepreneurship policy.

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<sup>1</sup> The National Advisory Committee for Aeronautics (NACA) was founded in 1915 and is followed by NASA in 1958.

<sup>2</sup> This policy followed some New Deal ruling for SME.

<sup>3</sup> Boulevard of Broken Dreams, Princeton University Press, 2012



The 4 dimensions of the US innovation policy (diagram by the author)

### Consensual Democracy

This collective approach and the progressive conception of a US innovation policy are a great lesson of Consensual Democracy: the original question about the “measures” was set up in the middle of the 2000s. The first report named “Gathering storm” was edited in 2007; several meetings in the US and in the world allowed to feed and foster the debate, to bring ideas to maturity and to express all possibilities. Experiences, successes, analyses accumulate and are embedded in an international approach to build an American synthesis. At the same time, several consensual laws are passed by a republican Parliament and signed by a Democratic President: patents law, extension of the SBIR, Innovation Act, Startup Act... On the innovation topic, there are a variety of sensibilities, but a real consensus for acting.

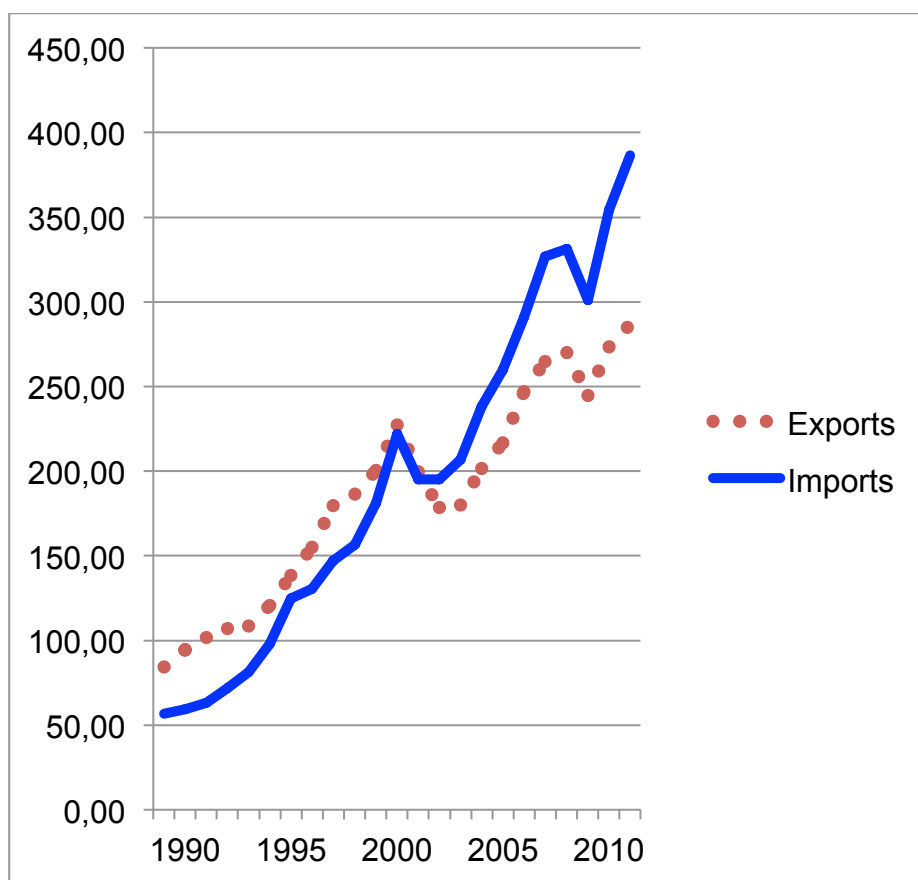
<b>A complex organization</b>
1 - National Academies (National Academy of Sciences, the National Academy of Engineering, and the Institute of Medicine)
2 - National Research Council (NRC), Dr. Ralph J. Cicerone, Chair and Dr. Charles M. Vest, vice chair.
3 - Board on Science, Technology and Economic Policy (STEP), Paul L. Joskow, Chair + STEP Staff, Stephen A. Merrill, Executive Director; Charles W. Wessner, Program Director
4 - Committee on Comparative National Innovation Policies: Best Practice for the 21st Century, Alan Wm. Wolff, Chair + Project Staff, Charles W. Wessner, Study Director
5 - Committee on Competing in the 21st Century: Best Practice in State and Regional Innovation Initiatives; Mary L. Good, Chair + Charles W. Wessner, Rapporteur

### Analysis in the early 2000s

Initial analysis by academics as Rosenbloom<sup>4</sup>, underlined the end of the US innovation system which didn't work anymore: Fundamental research managed and paid by the Federal Government through institutions like NSF and development research managed and paid by big

<sup>4</sup> Author with William Spencer, of Engines of innovation – US industrial Research at the end of an era, Harvard Business School Press, 1996

companies and Groups. The shift to an open model based on Universities and tech transfer to SME, has begun in the 80's, under the Bayh-Dole Act. In the 2000's, it appears that this innovation system is no longer efficient to keep America as the unrivalled leader of the World. The technical products balance sheet became negative at the beginning of the 2000's.



*U.S. exports and imports of advanced technology products – 1989-2011,*

*SOURCE: U.S. Census Bureau, Foreign Trade, Trade in Goods with Advanced Technology Products..*

STEP works included a large comparative analysis of innovation strategies throughout main countries, to find what could be efficient to restart the US innovation & leadership machine. In 2012, two key reports published by Charles Wessner<sup>5</sup> and al. supply the main items of the synthesis.

### **The basis of the consensus in progress**

The current analysis is that the erosion of US leadership is the result of the attrition of the current innovation system (decrease of funding of research<sup>6</sup> and decrease of real VC<sup>7</sup>) and of the alleged unfair competition from emerging countries.

<sup>5</sup> and Alan Wolff, editors of the report « Rising to the Challenge: U.S. Innovation Policy for Global Economy » - 2012, by the Committee on Comparative National Innovation Policies : Best Practice for the 21st Century + Board on Science, Technology, and Economic Policy + Policy and Global Affairs.

- With the Committee on Competing in the 21st Century: Best Practice in State and Regional Innovation Initiatives; Board on Science, Technology, and Economic Policy; Policy and Global Affairs; National Research Council « Clustering for 21st Century Prosperity »

- National Academy of Sciences, National Academy of Engineering, and the Institute of Medicine, Rising Above the Gathering Storm: Energizing and Employing America for a Brighter Economic future, Washington, DC: The National Academies Press, 2007.

- National Academy of Sciences, National Academy of Engineering, and Institute of Medicine, Rising Above the Gathering Storm, Revisited: Rapidly Approach Category 5, Washington, DC: The National Academies Press, 2010.

<sup>6</sup> In 2012, The Battelle report shows a 0,7% decrease of the funding of R&D. in “2013 Global R&D Funding Forecast”, Battelle, R&D Magazine, December 2012

<sup>7</sup> As stressed again by the last report of PWC « Double-digit dip » in February 2013

The unfair innovation policies of emerging countries are harshly highlighted. These policies aimed to help R&D and industrialization too, with no respect to free market regulation. That leads to an unfair competition and the US have to meet this challenge:

- For the innovation process, the Committee suggests new subsidies such as Tax Credit for Research, cluster development and pre-financing loans, etc.
- For industrialization, the Committee suggests that the US asks for removal of foreign subsidies or develop similar systems. This may be the end of the fables company<sup>8</sup>.

US entrepreneurship is ignored by the reports while all international experts consider that it is the main innovation engine of USA. American experts didn't feel this point that may be the 4<sup>th</sup> dimension of innovation policy - and the most important one. By the way, the debate on graduated immigrants may be considered as the beginning of a debate on the importance of entrepreneurship.

Reading these reports and new legislation, shows that the US has found the basis of a four points consensus:

- The need of a global innovation policy
- A new distribution of roles and responsibilities of the main actors of this global innovation policy: States for education and clusters; large companies for incremental innovation; Start-ups and SME for free innovation.
- A competition regulation for all competitors, based on reciprocity and fair competition.
- Entrepreneurship and a free market are still the implicit bases and may need specific measures.

So we arrive to a new vision that will be the foundation for new Federal innovation policy, for new States innovation policies, and as a framework for all partners. The slow maturation (already 9 years) is the greatest strength of this process and can make the future of US innovation even better and greater.

### **Patrice Noailles-Siméon**

- Economist, Advisor of the French minister of research (1986)
- Author of : « De Gaulle & la technologie » (1994 – forewords by Stanley Hoffmann) and of « L'Innovation - valeur, économie, gestion » (2008)
- Founder and CEO of a privately held VC fund.
- Member of the board of the Evry University (France)

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<sup>8</sup> See also the MIT report on Production in the Innovation Economy – 2013