Article #5 – Innovation

The Role of the State in Supporting Innovation.

Will the invention of new products that were imagined only in the science fiction literature happen without the slightest help from the government within a purely capitalist system. Are the "invisible hand" and the profit incentive alone sufficient to stimulate innovation and create cutting edge advances?

The question of the role of the state has been keenly debated when the US gained its independence; the philosophy of two of the framers of the Constitution, Jefferson and Hamilton, gave rise to two schools of thoughts. The Jeffersonians felt that "he governs best who governs least" while the Hamiltonians favored active government involvement.

In order to arbitrate the debate in the context of innovation, it would be useful to investigate how the development of many new products of the high-tech industry has occurred. Keen to protect the country and to remain a world leader, the US government has spent huge sums towards the development of military and space technology, and more generally on research and development (R&D). One would think that some of this would trickle down to the private sector. In fact this has happened through three channels.

First some of the technology essential to the high-tech industry was directly developed by government agencies: one does not have to think far to mention the internet, GPS positioning, or voice-activated assistant. In addition, the government finances research in publicly-funded universities and laboratories where technologies like the touch screen or the HTML language were developed. Finally the government makes funds available for research through various organizations. Academics are very familiar with two of them: the National Science Foundation (NSF) funded the research leading to the development of the search algorithm used by internet search engine and the National Institutes of Health (NIH) finances most of the breakthrough discoveries essential to the development of medications and medical procedures eventually marketed by the biotechnology industry. At this point, we can draw a list of successful companies that owe a lot to government's spending on R&D: Boeing, Apple, Microsoft, Google, Pfizer – the list is endless.

Nevertheless the conventional wisdom has been that states should intervene solely to correct market failure by investing directly in certain areas or by nudging the tax system. Does the case for government investment in R&D fit such criteria? If the private sector, with its short-term profit maximizing bias, is unwilling to get involved in risky long-term R&D investment, can this be regarded as market failure?

Many states, adhering to this line of thought, have poured huge amounts of funds in research, hoping to develop an advanced high-tech industrial sector only to find their efforts completely wasted; non-discriminatory state aid is well known for its lack of success. On the other hand, a state supporting its R&D in a discerning manner is more likely to achieve a better allocation of aid and a higher success rate. For instance, in the US, academics have to compete for government funds by applying for NSF or NIH grants and, in addition, the symbiosis between state universities funded research and profit-maximizing companies is encouraged. Is there a middle ground for government involvement in innovation between the two schools of thought?

Read the above article and write an essay answering the following question: The Jeffersonians versus the Hamiltonians: which school of thought is right about the financing of R&D or do they both have a point? Use arguments from the article and your own ideas to discuss the issues and make your case.

Evaluation will be based on the accuracy, clarity, completeness, and originality of your answer. A good essay should be well written, well organized, and coherent.

ESSAY EXAMPLES - score 6 or 5 – Very Strong

Essay 1

Should government intervene to stimulate innovation by funding research and development (R&D)? The issue of state aid has always been controversial. In fact, there was already a debate about the extent of the role of government when the framers wrote the Constitution. One group adhered to Jefferson's philosophy believing in small government while another group led by Hamilton saw a definite role for government. Interestingly this dichotomy is still with us.

However, to find out whether the success of our high tech sector is partly based on public contribution, we can look at some specific cases. In fact, we do not have to look farther than the city of Seattle. Seattle is the home of the US main aeronautic industry, Boeing; it can also boast a thriving high-tech sector with companies like Microsoft and Amazon; finally Seattle has a diverse biotechnology industry. The case of Boeing is straightforward: as a military contractor during the second world-war, it developed a plane to carry soldiers that was easily transformed into a passenger plane right after the war ended. As an ongoing military contractor, Boeing is still able to transfer innovations developed for the Pentagon into their profit-making division. The Seattle high-tech industry is also highly dependent on innovations such as the internet, the search engine, GPS etc. developed in the public sector. Finally Seattle is endowed with a public university, the University of Washington, which possesses strong engineering and computer science departments. But the university's greatest strength resides in its medical school. It is one of the top recipients of NIH funds in the country and is a leader in the area of cancer research. This translates into a vibrant cooperation with the local private biotechnology sector.

It seems that Seattle makes a good case for the Hamiltonian school of thought. However, whenever state funds are allocated to education and research, there is always a great fear among citizens and elected politicians that part or all of these funds will be wasted because accountability is very difficult to monitor without the profit incentive. This is why the Jeffersonians in the Washington state house in Olympia are always weary about funding their own state university.

In conclusion, the success of Seattle might be Hamiltonian, but checks and balances from the Jeffersonians remain significant.

Essay 2

Ever since the establishment of the Republic, the citizens of the United States have been torn by the question of how much government intervention is needed to keep the US at the forefront of technology. The idea that Adam Smith's invisible hand is all what it takes to promote cutting-edge innovations in all sectors of the economy has now been debunked. Interestingly, this did not happen as a deliberate policy rebuking the Jeffersonians and supporting the Hamiltonians ideas that active government involvement would be beneficial. It happened because the US wanted to keep its dominant position in the world.

To do so, the US government was willing to make huge investments in military and space technology. Since, in the American capitalist format, the private sector is the purveyor of these technologies, this could only happen through massive subsidies to these firms. For

instance, companies like Boeing were the recipients of these subsidies during the Second World war – when peace broke, Boeing went back to become a producer of commercial aircraft and became the world leader in aircraft technology.

The article mentions a long list of companies that, like Boeing, have benefitted of new technologies facilitated by government subsidies. One can note that the party which clamor most loudly the benefits of small government is totally at ease about giving subsidies to large companies (e.g. the oil industry) – in this respect this party is more Hamiltonian than Jeffersonian.

If it is quite acceptable to give subsidies to the private sector to advance technology that protect the US and ensure its leading position, the next question concerns the best way for the government to support innovation. The US and its European allies have a different take on capitalism. The belief in profit incentive is stronger in the US while many European countries adhere to a "mixed capitalism" approach where companies are often state-owned and receive large subsidies. Without any profit incentive, this format has not been effective at promoting new technologies as it often results in waste.

In conclusion, the US model has been quite successful. To continue in its stride, it is important to stimulate the private sector with nuanced incentives. Basically the government should be able to help the private sector in its effort to develop new technologies without destroying profit incentives and competition.