Innovation Management and Strategy
Prof. Dr. B. Van Looy
Exam Questions
Preliminary List - Part I

1) Schumpeter is considered as one of the pioneers who recognized the importance of innovation for understanding the dynamics of wealth creation. Can you briefly describe some of his main ideas? Do you consider them still relevant today? Argue why (not) and/or to what extent.

2) Baumol claims that innovation can be understood as the engine behind free market growth. Briefly explain his ideas. Do you agree? Why (not)? Do you think his account provides a complete perspective on innovation dynamics within market economies? Argue why (not)?

Once capitalism was in place and fully operational, a flow of innovation and the consequent rise in productivity and per capita gross domestic product were to be expected. The greed where A. Smith refers to in the economical sentence translated into continuously searching for profits. Companies therefore do not battle any more only on prices but on the flow of innovations.
More growth has to be expected when these 5 conditions are more in the market:

1. oligopolistic competition
2. routinization of R&D process
3. Productive entrepreneurship (contra Schumpeter II)
4. Rule of law ➔ stand in for enforceability of contract between partner)
5. Possible: Technology selling and trading (sell vs. license)

Not only big but also small firms contribute to technology and science. Large firms are important for incremental innovations; providing the customers more product reliability.
Small firms are important for major breakthroughs.
Baumol claims that innovation flows could be enhanced by the cooperation of the government (active and passive) and the universities.
Passively by providing a good Intellectual Property Right protection to the firms.
Actively by spendin' money into basic research (done by universities)
Baumol also states that there is an important trade-off: getting monopoly power by heavily investing into R&D but knowing that power is just for a while (until new technique has made his way to the top, very fast nowadays).
This however is not a problem: firms engage into R&D cooperation hereby reducing risk of uncertainty and also may block new entrant. This is due to the fact that the entrant is not admitted to the possible technique → antitrust?

He also stated that foreign innovation is also extremely important. The government should for example contribute to the smoothly integration of skilled foreign engineers.

Agree on Baumol findings however did not mention about certain aspects of innovation dynamics:

- What about the market failures? Also important for innovation?
- Differentiation problem: he mentioned that innovations should be adapted to the customers need however he did not told that this could impede the R&D cooperation
- Did not mentioned that an option is that the government can grant a firm a possible patent hereby assuring that a company will engage into R&D.
- What about moral hazard problems when cooperating between firms?

Versie 2:

A) Briefly explain his ideas

Baumol believes that innovative activity is mandatory for firms in free market economies to survive. Also, the new technologies spread much faster in capitalistic industries (or free market economies) than in other types of economies. The primary product of capitalism (or free market) is economic

growth, which will appear automatically by itself and without any planning or decision making. This capitalist economies have competitive pressures which are not present in other economies that force companies to invest in innovation and provide incentives for a fast dissemination (=spread) and exchange of improved technologies throughout the industry.
Following features are typically available in free-market economies or capitalist economies that are most innovative:

- Oligopolistic competition in capitalist free-markets: innovation has replaced price as being the most important competitive weapon
- Routinization of innovative activities: this makes innovation a regular ordinary component of the firm's activities; uncertainty is minimized
- Productive entrepreneurship: entrepreneurs prefer productive innovation to innovative rent-seeking (=the non-productive pursuit of economic profit)
- Rule of law
- Technology selling and trading

These features are crucial for the extraordinary growth of free-markets. They are fundamentally different from other types of economies. Other economic systems may produce some *inventions*, but only capitalism produces *innovation* in the Schumpeterian sense: making technological progress itself in an industry that provides inputs to others

In most literature, free market firms are characterized by a tendency towards static efficiency (=use the most economical of the available methods of production and supply the marketing mix adapted to the demand). This however implies that there would be a level of innovation far below the optimal level, because of spillover effects to other firms. Nevertheless, Baumol argues that in capitalistic economies, there is still high innovation because of competitive market pressures that force the firm to integrate innovation into their routine decision processes and activities. Baumol says that there is too little attention for innovation in standard microeconomics, which is currently focusing on prices and its related variables. Routine innovation is at least that important as price in the competitive process. The competitive pressures have forced companies to systemize innovation processes to a accustomed and predictable controlled procedure (routinized). Moreover, innovation stimulates innovation, so innovative activities can be considered to be a cumulative process, in which there is feedback from one innovation to the next: once innovation is launched in an industry, it will spread and cause new innovations. It is often most profitable for an owner of an innovation to spread the technology to competing firms since the financial rewards help to internalize the externalities of the innovation process.

B) Do you agree? Why/Why not?

Although some of Baumol's statements are very informative, his theory should be handled with care.
For example, not *all* free market economies in which people were more or less free to chase their economic interests ended up being equally technologically creative and innovative. Moreover, the author's enthusiasm for routinized research by oligopolies leads to underestimate the importance of preserving not only competition among those large firms but also competition from "the inspired innovator." Can a search for the unknown really be routinized? Can one conclude that the nineteenth century discoveries in the fields of for example electricity were driven by free market capitalism?
Furthermore, I don't think that innovation is more important than price in the competitive process. It is not that evident that the benefits of innovation would be passed on to consumers if price competition is not dominant.

C. Do you think his account provides a complete perspective on innovation dynamics within market economies? Argue why/why not?

No, he doesn't offer a complete perspective.

- The selection of new techniques in "free" markets in capitalist economies also have a large component of political decision-making in them.
- The theory doesn't say how the spending norm of firms on innovation should be determined. What is the equilibrium?
- Another concern is the possibility of winner-take-all patent races: the highest bidder wins, but every bidder has to pay. In such circumstances, collusion to reduce duplicative efforts might be socially desirable.

- Baumol also puts much more emphasis on the incremental improvements to innovations than to the original innovations themselves. In this routinized R&D that is essential for firms to survive, where do good ideas come from?
- Baumol underestimates the entrepreneurial element in bringing the results of R&D to the market. How do good ideas get into the marketplace? The apparently small step between R&D and a marketable product is entrepreneurship, but this is neglected by Baumol.

3) Several authors claim that innovation is a field characterized by the presence of market failures. What is understood by this notion? Would you agree that such market failures are indeed present? And if so, does this apply for all types of innovative activity?

Roberts and Frohman told that there has to be a tolerance of false foundations→ can prove to be challenging new starts. Therefore we should accept market failures.

Arrow: uncertainty involved in technological & development process cause market failures.

A solution could be:

- Like stocks, having a big portfolio (only by big firms possible).
- Having an insurance → averse selection could take place → no insurance anymore (too high problem).
- Investing in basic research by government in universities → split commercialisation and science.

Market failures are widely common in every industry. These market failures could enhance the future developments. However in industries where there are no or few process innovations (in the model of Abernathy & Utterback) (like in bulk chemicals) these market failures are do not contribute to product development

4) Is it justified to support R&D activities with public money? Why (not)?

5) Briefly explain what is understood by the notion of 'innovation system'. What does it add to our understanding of innovation dynamics? What could be the role of universities or research institutes within such a system?

6) Briefly explain what is understood by the notion of 'innovation system'. What does it add to our understanding of innovation dynamics? From an innovation system perspective, what should you recommend the EC in order to meet the Lisbon targets?

7) What is the difference between 'market pull' and 'technology push'? Does this distinction hold any relevance for a firm's innovation strategy? Argue why (not)?

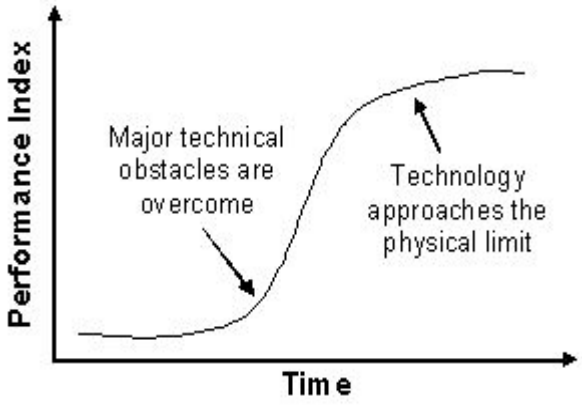
8) Innovation dynamics are not time-invariant. Briefly explain what is meant by this idea. How can this idea be useful for guiding innovation related decisions (both on the policy and the firm/managerial level)?

Innovation dynamics are not time-invariant. Briefly explain what is meant by this idea.

In the past, models were static in nature, meaning they considered the factors affecting innovation under a fixed perspective. The following models include the innovation "dynamics", in a time-variant approach. Three relevant models are discussed. However the explanation should be briefly, just to give you a better overview of the dynamics the three models are explained more in detailed lower.

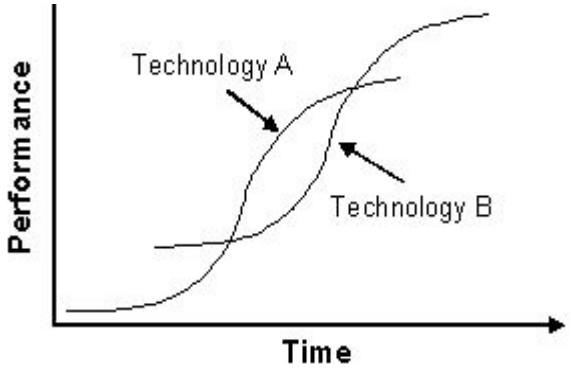
When explained **briefly**, it can be stated that the innovation models have become more dynamic in time. Meaning that factors affecting innovation are variable, instead of with a fixed perspective.
In the S-Curve model, in the early stage, large amounts of resources have small effects on innovation improvements. During time the innovation technology accumulates, till it in the end is faced with physical limitations.
The Abernathy-Utterback Model adds that when there is an innovation, three phases are detected in time. In the “fluid phase”, there is a high product innovation (e.g. product design, operational characteristics), with much less attention given to the processes by which products are made. Secondly, innovation will evolve to the “transitional phase”. Standard optimal product designs become settled, not the product innovation but the process (e.g. efficient production) innovation is important in this time stage. Finally, in the “specific stage”, innovations for product and process decreases, now the industries become extremely focused on cost, volume and capacity.
The disruptive models shows the difference between sustaining in or disruptive in time. Sustaining innovations are the incremental year-by-year improvements or breakthroughs, where established competitors almost always win the battles of sustaining technology. Disruptive innovation do not attempt to bring better products to established customers in existing markets. They disrupt and redefine that trajectory by introducing products and services that are not as good as currently available products. However, they offer other benefits, for example they are simpler, more convenient and less expensive products that appeal to new or less-demanding customers. Resulting in a new cycle. In time, this “not-good-enough” technology will improve, till it intersects with the needs of more demanding customers. When that happens, the disruptors are on their way to defeating the incumbents

Models more in detail:
S-Curve:



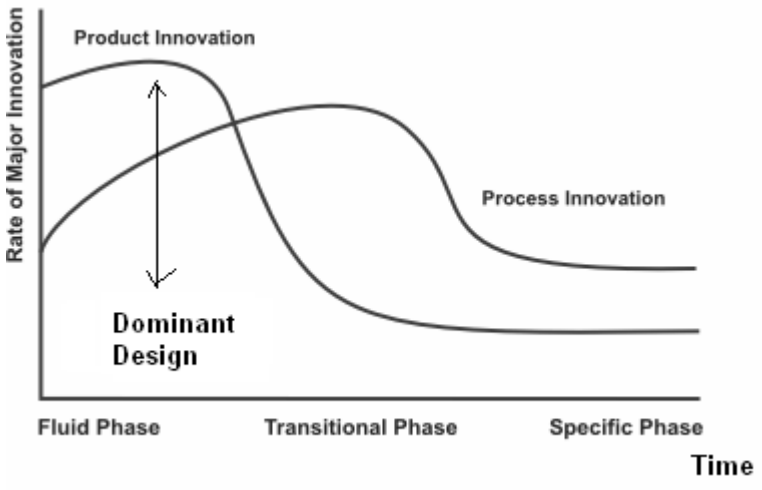
In the innovation management field the S-Curve illustrates the introduction, growth and maturation of innovations as well as the technological cycles that most industries experience. In the early stages large amounts of money, effort and other resources are expended on the new technology but small performance improvements are observed. Then, as the knowledge about the technology accumulates, progress becomes more rapid. As soon as major technical obstacles are overcome and the innovation reaches a certain adoption level an exponential growth will take place. During this phase relatively small increments of effort and resources will result in large performance gains. Finally, as the technology starts to approach its physical limit, further pushing the performance becomes increasingly difficult, as the figure below shows.

When a product reaches its limit, new technologies can expand the S-curve. This innovation creates a new S-curve, if it is shifted to the right compared to the original one, it can reach a higher performance limit.



Abernathy-Utterback Model:

As the figure indicates, the rate of product innovation in an industry or product class is highest during its formative years. During this period, called the 'fluid phase,' considerable experimentation with product design and operational characteristics takes place. This phase is characterized by high product innovation, with much less attention given to the processes by which products are made.



The period of fluidity, according to the model, typically gives way to a 'transitional phase' in which the rate of major product innovation slows down and the rate of major process innovations speeds up. At this point, product variety is superseded (or outdated) by standard designs that have proven themselves in the market as best satisfying user needs, or designs that have been dictated by accepted industry protocols or regulations. As the form of the product becomes settled, the pace of innovation in the way it's produced quickens.

Finally, some industries into what Abernathy and Utterback call the 'specific phase' in which the rate of major innovation dwindles for both product and process. These industries become extremely focused on cost, volume and capacity; product and process innovation appears in small, incremental steps.

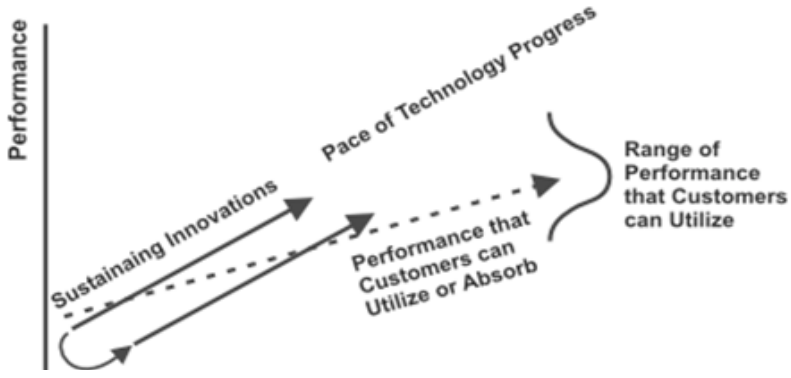
Not all industries or products pass through these phases, but the model has proven durable over the years as a way of explaining the pace of innovation as a competitive advantage.

Source:

Utterback, James M.; Mastering the Dynamics of Innovation; Harvard Business School Press; 1994.

Disruptive Innovation Model:

Harvard Business School professor Clayton M. Christensen described



his Disruptive Innovation Model in The Innovator's Dilemma (1997). The model identifies three critical elements of disruption.

First, in every market, there's a rate of improvement that customers can utilize or absorb, represented by the dotted line slopping gently upward across the chart. To simplify the chart, customers' ability to utilize improvement is depicted as a single line; in reality, there's a distribution of customers around this median—a range indicated by the distribution curve at the right. Customers in the highest or most demanding tiers may never be satisfied with the best that's available and those in the lowest or least demanding tiers can be over satisfied with very little. The dotted line represents technology that's 'good enough' to serve customers' needs.

Second, in every market there's a distinctly different trajectory of improvement that companies provide as they introduce new and improved products. This pace of technological progress almost always outstrips the ability of customers in any given tier of the market to use it, as the more steeply sloping lines in the chart suggest. Accordingly, a company whose products are squarely positioned on mainstream customers' current needs today will probably overshoot what those same customers are able to utilize in the future. This happens because companies keep striving to make better products that they can sell for higher profit margins to not-yet-satisfied customers in more demanding tiers of the market.

The third critical element of the model is the distinction between sustaining and disruptive innovation. A sustaining innovation targets demanding, high-end customers with better performance than what was previously available. Some sustaining innovations are the incremental year-by-year improvements that all good companies produce. Other sustaining innovations are breakthrough, leapfrog(=sprongsgewijs)-beyond-the-competition products. It doesn't matter how technologically difficult the innovation is, however: The established competitors almost always win the battles of sustaining technology. Because this strategy entails making a better product that they can sell for higher profit margins to their best customers, the established competitors have powerful motivations—and the resources—to fight and win sustaining battles.

Disruptive innovations, in contrast, don't attempt to bring better products to established customers in existing markets; rather, they disrupt and redefine that trajectory by introducing products and services that are not as good as currently available products. But disruptive technologies offer other benefits—typically, they are simpler, more convenient and less expensive products that appeal to new or less-demanding customers.

Once the disruptive product gains a foothold in new or low-end markets, the improvement cycle begins. And because the pace of technological progress outstrips customers' abilities to use it, the previously not-good-enough technology eventually improves enough to intersect with the needs of more demanding customers. When that happens, the disruptors are on their way to defeating the incumbents. This distinction is important for innovators seeking to create new-growth businesses. According to Christensen's model, whereas current leaders of the industry almost always triumph in battles of sustaining innovation, successful disruptions have been launched most often by entrant companies.

Source
Christensen, Clayton M.; The Innovator's Dilemma: When New Technologies Cause Great Firms to Fail; Harvard Business School Press; 1997.

How can this idea be useful for guiding innovation related decisions (both on the policy and the firm/managerial level)?

At policy level, decisions will be based on where should we compete or where should we innovate. The managerial decisions will be based on how should we compete or innovate.

As seen in the S-Curve, in the first time stage a lot of money, effort and other resources are expended with low improvement results. In the further stages, the technology will accumulate and will pay off. Therefore, long-term decisions on where the innovation investments will go to and how much resources can be put into the innovation, have to be made.

Another element that the models have showed, is to indicate where the product is in the S-curve and at what pace the current products are reaching their limits. These elements indicate what the potential of the current product still is and at what time it is interesting to launch a new product.

Policy makers should more be aware of the Christensen model, are they focusing on sustaining innovations or disruptive innovations. An even more important question is whether there is a possible disruptive threat and should we compete against these threats. These questions combined with elements, such as the potential market and the available resources, are important to create a long-term strategy with time-variance in mind. It is best that policy makers continually think about the different time stages in innovations and to communicate them to the firm level.

At firm level, they should consider the chosen innovation strategy and the possible threats. It is up to them to elaborate the different stages in an innovation process, from the fluid phase till the specific phase. And they should also prepare reactions towards disruptive innovations, especially when a disruptive technology has the possibility to take over the current technology. Furthermore, it is up to them to make the different time stages operational. The research and development department should be aware of the focus at each time stage. And it is also important for other departments to know in what stage the product innovation is. For example, marketing will focus on different promotional aspects in each stage or logistics will have to become more efficient in the last innovation stage.

9) A more 'entrepreneurial' orientation of universities might contribute to economical growth dynamics. Do you agree? Why (not)? What are crucial points of attention in this respect (for policy makers and/or the management of knowledge generating and diffusing institutes like universities)?

A more 'entrepreneurial' orientation of universities might contribute to economical growth dynamics. Do you agree? Why (not)?

I agree with this statement. Entrepreneurship in general has long been valued as a key contributor to the growth of an economy. If we talk about entrepreneurship, moeten we meteen denken aan Joseph Schumpeter. In his vision, the entrepreneur was the partner of the inventor -the businessperson who recognizes the value of the invention, determines how to adapt it to the preferences of prospective users and whose tasks include bringing the invention to market and promoting its utilization. It is widely believed that economies that are abundantly supplied with entrepreneurs will tend to grow far more rapidly than those in which entrepreneurial talent is scarce. Also universities kunnen hier een rol inspelen. If universities become more commercial, more entrepreneurial, this would contribute to economical growth dynamics.

The reduction of research funding has forced public sector institutions, especially universities, to undertake activities that either attract industrial funding or generate income. In part responding to government policies, universities have become involved in exchange activities such as contract research, licensing patents, establishing innovation centres and spin-off companies. In de VS is dit al het geval, willen we in Europa ook die duidelijke shift naar "entrepreneurial" universities zien, dan zullen er nog een paar dingen moeten veranderen. This will require new institutional orderings (universities should be part of a new knowledge infrastructure where knowledge exchange and exploitation more effective kunnen verlopen) and modified academic regimes that govern and reward entrepreneurialism. In europa is er heel lang gedacht er is er soms nog steeds de vrees, dat je moest kiezen tussen goed zijn in science of developing entrepreneurial activities. Dit is echter niet het geval. Empirische studies hebben aangewezen dat goed zijn in science universiteiten helpt met het ontwikkelen van hun entrepreneurial activities.

What are crucial points of attention in this respect (for policy makers and/or the management of knowledge generating and diffusing institutes like universities)?

Het kan natuurlijk niet de bedoeling zijn dat universities de rol van de bedrijven overnemen, er moet dus een duidelijke rolverdeling zijn tussen universities en bedrijven. Universities should be more involved in knowledge transfers but how should universities be related to firms? Een antwoord hierop heb ik al gegeven in het vorige stuk nl. door contract research, licensing patents, establishing innovation centres and spin-off companies. However we should also pay attention to who should get the benefits from this (the benefits from these entrepreneurial activities). Should these benefits go to the professor, the university, the inventor or the tax payers? It is important to have a clear legislated framework about this.

Volgens sommigen hangen aan deze verschuiving (de verschuiving naar meer entrepreneurial universities) gevaren vast:

1) We zullen belanden in een omgeving vol secrecy en corporate manipulation efforts

Indien dit het geval is zal je wnn je iets vindt met a lot of economical potential het proberen te verbergen voor anderen. Er zal dus een secret onstaan about the core knowledge.

2) Er zal skewing optreden. You move away (afwijken) from the basic to applied. Je wijkt af van de basisopdracht van universiteiten nl het beoefenen van de "pure wetenschap" en het onderrichten ervan (the generation of knowledge and the learning role).
3) De kans bestaat dat you will say what industries like you to say. So there can be corporate manipulation efforts and these will kill the science itself.

Wanneer we deze gevaren in rekening nemen, blijkt het toch dat deze verschuiving naar meer entrepreneurial activities niet zonder gevaren is. Dus ondanks de voordelen that it has for the economic growth, we should take these risks/threats in consideration.

Versie 2:

Meer ondernemings georiënteerde universiteiten kunnen zeker **bijdragen tot economische groei**. Onderzoek aan de universiteit wordt grotendeels gefinancierd door zowel de overheid als door privé bedrijven. Dankzij deze steun krijgen de universiteiten kansen om op **wetenschappelijke domeinen doorbraken** te realiseren. Typische voorbeelden zijn hier het onderzoek naar kanker, stamcellen, DNA, … Vanzelfsprekend is dit van zeer groot belang voor de maatschappij dat hier onderzoek naar verricht wordt. Niet alleen op het medische vlak heeft onderzoek bewezen waardevol te zijn, maar ook op andere domeinen zoals technologie (denken we maar aan de elektronische computer, het internet, …), economie, sociologie, … Onderzoek leidt ook tot snellere en betere exploitatie van nieuwe uitvindingen. Bovendien kan door onderzoek aan universiteiten een **regio** volledig **economisch opgeknapt** worden. Voorbeelden zijn hier: Sillicon Valley (op grote schaal) en iets korter bij huis het research park in Heverlee (welliswaar op een kleinere schaal). Hier vestigen zich dikwijls **spin offs** van de universiteiten. Een spin off is een bedrijf gebaseerd op de kennis van de unief, maar opgericht om een eigen product te maken (vb: LMS, Metris). Deze spin offs dragen ook bij tot de economische groei omdat zij blijven doen aan onderzoek en ontwikkeling en trachten om een zo efficiënt mogelijk product op de markt te brengen.

Ondernemende activiteiten binnen universiteiten kennen een groeiende tendens, maar er zijn toch nog enkele **aandachtspunten**. Ten eerste zijn er grote verschillen binnen en tussen landen. Dit kan te wijten zijn aan de institutionele factoren die onderzoek kunnen stimuleren of belemmeren. Ten tweede, binnen de activiteiten van universiteiten maken ondernemende activiteiten nog maar een klein deel uit. Ten derde, moet er aandacht zijn voor de veld specifieke karakteristieken van sommige activiteiten zoals biomedische wetenschappen.

Er is sprake van een duaal interactie effect binnen de universiteit en binnen de regio. Wetenschappelijke vermogens leiden tot het ontstaan van een meer ondernemings georiënteerde universiteit en deze universiteit is aanwezig en interageert met de locale bedrijven.

Het beleid van de overheid moet erin bestaan om de R&D activiteiten te ondersteunen waarin de overheid de rol van de klant speelt. Het is niet de taak van de overheid om de succesvolle projecten verder te ondersteunen.

Baumol heeft ook geargumenteerd dat **ondernemerschap de grote succesfactor is voor de economische groei**. De overheid kan 2 rollen innemen: een passieve en

actieve. Aan de passieve kant zorgt de overheid voor een legaal kader dat het ondernemerschap stimuleert. Denken we maar aan patenten, afwezigheid van de overheid door zich niet te mengen, vormen van nieuwe firma's, … Door een actieve rol in te nemen gaat de **overheid basisonderzoek ondersteunen**. Maar het ondersteunen van basisonderzoek is bewezen niet waardevol te zijn omdat er grote onzekerheden en onvoorspelbare winsten aan vasthangen. Dit onderzoek is dus niet aantrekkelijk voor privé bedrijven. Hoewel basisonderzoek in de lange termijn wel vele vruchten afwerpt. Dus moeten universiteiten hun bezig houden met basisonderzoek en privé bedrijven eerder het toegepast onderzoek verrichten. Effectieve programma's ter ondersteuning van het ondernemerschap zijn zeer belangrijk, maar er kan nog meer gedaan worden dan er hedendaags gedaan wordt. **Basisonderzoek** kan bijdragen tot **economische groei**, althans in de **lange termijn**, maar haar twijfelachtige opbrengsten maakt het ongeschikt voor de private investeerders. Inderdaad, de onderzoeksactiviteiten ondersteund door de overheid baseren zich dikwijls op basisonderzoek omdat dit de meest effectieve en vertrouwenswaardige manier is om dit soort onderzoek uit te voeren.

De overheid heeft ook een rol om **buitenlandse technologie te verwerven**. Ze kan dit doen door:

1) Education and training
De overheid kan beurzen geven voor ingenieursstudies aan studenten van kleinere landen die studeren in US, Japan, …en andere landen die leiders zijn in productie en innovatie.

2) Immigration of foreign technicians and related personnel

3) Establishment of observer staff in the country's embassies

4) Study of measures taken by governments in other countries to facilitate absorption of foreign technology by their industry

Een artikel van Van Looy bevestigt dat **universiteiten** gezien worden als **belangrijke spelers** in het stimuleren en beïnvloeden van het **innovatieve** potentieel van een gemeenschap. Ondernemende universiteiten hebben gezorgd voor enkele **ontwikkelingen** zoals een stijging in patent en licensing activiteiten, institutionering van spin offs en bedrijfs- en gedragveranderingen bij academici met het oog op samenwerkingen met de industrie.
Belangrijke **voordelen** zijn: verbeterde industriële innovatie, additionele mogelijkheden voor het financieren van opportuniteiten en nieuwe innovaties door een toenemend gebruik van patenten en spin off activiteiten. Er zijn ook enkele **bezorgdheden**. Deze situeren zich op het vlak van verplichting en interest. Bij de academici heerst er een angst omtrent de universiteit-industrie samenwerking. Vooral het volledig verschillend belonings en incentive systeem baart hun zorgen. Bij het incentive systeem is er de grote zorg om de publicatie geheim te houden. Academici publiceren graag hun onderzoeksresultaten wat zorgt voor discussies met hun collega's. Wanneer er met een industrie samengewerkt wordt kan er wel eens het idee ontstaan om de info geheim te houden (**secrecy problem**). En andere zorg is the **corporate manipulation thesis** die stelt dat het academisch onderzoek bedorven gaat worden door de toepassing georiënteerde behoeften van de

industriële bedrijven. Onderzoek aan de universiteit is eerder vrij en onafhankelijk van aard. Bedrijven zouden wel eens misbruik kunnen maken van universiteitsonderzoek en dit gebruiken voor hun eigen doeleinden. Het **skewing problem** beschrijft deze wijziging naar een meer toepassingsonderzoek.

Bronnen:
→ slides over entrepreneurial universities
→ artikel Baumol: Entrepreneurial Enterprises, large Established firms and other components of the free-market growth machine
→ artikel Van Looy, Callaert & Debackere: Publication and patent behavior of academic researchers: conflicting, reinforcing or merely co-existing?