



# INNOVATION LECTURE 2001



Ministerie van Economische Zaken

# Gebrek innovatie nekt Nederlandse economie

de Volkskrant

Het p  
ROB H

krant Van een onzer verslaggeefsters  
DEN HAAG, dinsdag

Hoewel de Nederlandse economie op het eerste oog gezond lijkt, zijn de fundamenten aan het kraaken en scheuren. Het poldermodel is ten dode ongeschreven en Nederland moet het roer drastisch omgooien, wil het ook in de toekomst op internationaal niveau mee kunnen concurreren. Dat zei de Amerikaanse econoom Michael Porter, verbod aan de Harvard Business School, gisteren een lezing in de Haagse Ridderzaal.

Minister Jorritsma (Economische Zaken) nam in het voorwoord alvast afscheid van de verouderde technocratische opvattingen van de Nederlandse Staat. Het beginsel van vernieuwing is te lopen. Er is een tekort aan onderzoek en de relatie met onderzoek en onderwijs is onvoldoende, zo stelde Jorritsma.

Porter leidde het daarop volgende uur fjintjes de vinger op de zere plek. De strategie van loonmatiging en kostenbeheersing heeft zijn langste tijd gehad. En de industriepolitiek, waarbij de overheid bepaalde bedrijfstakken financieel ondersteunt, werkt hoogst ondoelmatig. Nederland moet de breedte van de omische vaartbanden van de scheepindustrie bij de analyse van de concurrentie op de wereldmarkt inzien.

Nederland werd goedkoper dan het nabije buitenland en daardoor steeg hier de werkgelegenheid en daalde de werkloosheid. Nu bijna de gehele bevolking werkt zijn de grenzen bereikt. Volgens Porter wacht nu de Nederlandse model hetzelfde lot als het Japane. Daar bleef namelijk ook de inflatie beperkt houdende.

**INNOVATIE** We moeten onze productiviteit verbeteren, zegt basisschoolleider Michael Port. Met name de universiteiten moeten competitiever worden.

cieler  
Henk Tolsma

derlandse universiteiten een omslag naar een dergelijke structuur nog het meest in de weg. Commerciële bedrijven wordt bij de meeste universiteiten 'not done' geacht, terwijl ze juist willen ren van de

Den Haag  
Nederlandse  
schuldt, aan

in de VS ziet degenen die anders zijn. Bij de eerste plaatsen op de lijst van nieuwsgangers maken Amerikaanse universiteiten

informatie, onder andere via de internet. Naast de alomtegenwoordige aanwezigheid van de computer, zijn er ook andere belangrijke ontwikkelingen die de manier waarop we werken en leven veranderen. Het is belangrijk om deze ontwikkelingen te begrijpen en te benutten.

Porter noemt de bron van innovatie om de productie kosten te verlagen moet zijn dan tot innovatiever zijn dan tot top-innovatie houdt r-top-innovatie en wetenschap en

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**Poldermod**

**In de Ridderzaal Lecture 2005**

Harvard University

**Lecturesvormen**

Van onze  
AMSTERDAM

Porter be-  
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De Nederlandse Staat heeft een belangrijke rol te spelen in het behoud van de kwaliteit van de arbeidsmarkt. Het is de taak van de Staat om de arbeidsmarkt te beschermen tegen concurrentievervalsing en concurrentievervalsing te voorkomen. Het is de taak van de Staat om de arbeidsmarkt te beschermen tegen concurrentievervalsing en concurrentievervalsing te voorkomen.

# Geen jansen

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Michael...

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probleem is dat het zo moeilijk is' afscheid te nemen van een succesformule als die nog werkt.

WISMAN

bloemen. De vier doorslaggevende krachten (productiefactoren, thuismarkt, netwerk en economische orde) vangt hij in het zogeheten diamantmodel.

de voorsprong die Nederland heeft genomen, zal snel verdwijnen.'

Recente macro-economische cijfers en internationale concurrentieranglijsten laten inderdaad de eerste waarschuwendende signalen zien. De export loopt dit jaar snel terug en ook als vestigingsland moet Nederland terrein prijsgeven. Fin-

turele verandering. 'Een doorontwikkelde economie kan op de internationale markten uiteindelijk alleen concurreren met toegevoegde waarde. Alleen voor bijzondere producten en diensten zijn afnemers bereid om extra te betalen. Daarin schiet het Nederlandse bedrijfsleven tekort, zo blijkt uit alle gegevens. Innovatie is hier een

ondergeschoven stapte. Met uitga-

onderzoek en ontwikkel-  
Nederlandsche overheid  
schuldig aan de stoer-  
nologische ontwikkeling  
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men met het bedrijfsleven  
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Amerikaanse economie  
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op de groei. Loon-  
poldermodel hebben hun  
tijd gehad, stelt Furler.

Herman Wilders, voorzitter van de VVD, heeft het poldermodel van de Nederlandse politiek als 'nomistische raamwerk' aangekondigd. Hij heeft aan bij de aangesloten partijen van de VVD een discussie over de toekomst van de partij voorgesteld.

Wel is h

om juis

met loc

Onderzoekers en beleidsmakers moeten een belangrijke motor voor productiegroei op lange termijn. En juist daar wringt de schoen. Nederland kent weliswaar een hoge arbeidsproductiviteit per gewerkt uur, maar de productiviteitsgroei laat het intermediair gezien, afweten. Een verbetering van de groei van de arbeidsproductiviteit is noodzakelijk voor verdere economische groei. De politiek is zich daarvan bewust en de bestaande voorbeelden aan de hand van de productieve innovatie van de economie worden in de toekomst steeds belangrijker.

Porto riep de groei bovenal in, kunnen bereikt door een versnelling van de innovatiekracht. Daar moest echter een centraal vertekten

Alleerst inzien dat de wereld met allehande productiviteitsgeregendes die uit de Verenigde Staten komen overwaait, maar de vermenende Mierwa Rose omte hebben we onze les wel geleerd. Daarnaast zijn we er nog niet met een flink aantal extra oetrollop en den inzien van innovatieve productiemethoden.

Productiviteit is een cruciaal succesfacto-  
 melijk ook om een aantrekkelijk investerings-  
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Een akte-

NRC Handelsblad

eiten liggen dwars  
Polder Nederland'

zij het verlagen van de loonkosten. Nederland werd gekroond koning van het nabije buitenland en daar door steeg hier de werkgelegenheid en daalde de werkloosheid.

Nu bijna de gehele arbeidsbevolking werkt, zijn de grenzen bereikt. Volgens Porter wacht het Nederlandse model hetzelfde lot als het Japanees. Dat bleek uiteindelijk ook slechts beperkt houdbaar.

provincie hangt samen met bovenaan deze lijst. De Nederlandse Universiteit van Leiden staat op de eerste plaats.

In de VS ziet de lijst er compleet anders uit. Bij de eerste twintig plaatsen op de lijst van patentaanvragers maken Amerikaanse universiteiten de dienst uit. De Universiteit van Californië staat bovenaan en is een belangrijke werkende factor van het succes van Silicon Valley.

**Loonmatiging en  
poldermodel niet  
langer houdbaar'**

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# Universiteit

# Verloren

De Nederlandse universiteit van Amsterdam

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# Kan bij oud-vrij

op de groei. Loonverhogingen op de poldermodel hebben hun tijd gehad, stelt Porter.

Herman Velders, voorzitter van de Nederlandse Economische Bond, zegt dat de Nederlandse economie moet concurreren op de wereldmarkt. Hij pleit voor een vermindering van de belastingen op arbeid en voor een verhoging van de belastingen op kapitaal.

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Onderzoek en ontwikkeling  
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mijn. En juist daar vindt de schoen-  
industrie een heel ander terrein.

Nederlandse arbeidsproductiviteit in per  
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laast het intercontinentaal gezien, af-  
weten. Eigen verbetering van de groei te ma-  
ken. De komende jaren

van de afwijking van de norm, de noodzakelijk voor verdere economische groei. De patiënt is ziek, het begin ligt aan de bestaande welvaart, is de reden waarom de economie Michael Porter's 'moderne' economie moet hervormen.

Pontier meent dat de productieve groei bovendien is kunnen behouden door een versnelling van de innovatiekracht. Daar, juist achter een

Alleen met de meest geavanceerde technologie

meende Mierwaas te zijn. Daarom  
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Productiviteitsgroei was re-  
melijk ook om een aanzienlijk on-  
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toelating tot concurrentievervals-

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# INNOVATION: WORK IN PROGRESS

WHAT DO YOU UNLEASH WHEN YOU INVITE ONE OF THE UNITED STATES' MOST EMINENT ECONOMISTS TO MAKE A CRITICAL EXAMINATION OF THE DUTCH KNOWLEDGE-BASED ECONOMY? A GREAT DEAL, AS WE FOUND AFTER THE ADDRESS GIVEN BY PROFESSOR MICHAEL E. PORTER DURING THE INNOVATION LECTURE ON 3 DECEMBER 2001, WHICH WAS ORGANIZED BY THE MINISTRY OF ECONOMIC AFFAIRS. THE MEDIA DEBATE ABOUT PROFESSOR PORTER'S VIEWS RAGED ON FOR MONTHS AFTERWARDS.

In his lecture, Professor Porter gave a sharp analysis of the Dutch economy. His message was that the Netherlands must watch its step because it is losing momentum as a knowledge-based economy. Not because it is performing badly, but because other countries are doing better. The Netherlands' success model of recent years has now come to the end of its cycle. A strategy based largely on cost control will no longer work. The Netherlands will have to realise its future economic growth through innovation.

Introduction by the Minister of Economic Affairs, Mrs A. Jorritsma-Lebbink, for the report on Professor M.E. Porter's Lecture on Innovation for the Ministry of Economic Affairs booklet



According to Professor Porter, our agenda for innovation should look like this:

- \_ Companies must invest more money in research and development; the government is already contributing a reasonably large amount; now it's time for trade and industry to do the same.
- \_ More researchers and engineers should be employed to make up the current shortfall.
- \_ The institutional structure of research institutes must change so that new scientific knowledge leads to genuine innovations within the private sector and society.
- \_ Cluster policy must be strengthened; the emphasis must shift from analysis to action.
- \_ Universities must undergo an attitude shift so that a better dialogue can be established between university researchers and companies.

\_I see Professor Porter's message as supporting the policy we pursue at the Ministry of Economic Affairs. Innovation is and will remain a top priority. However, the problems cited by Professor Porter are deep-rooted and will take time and effort to resolve. In my opening speech for the Innovation Lecture, I named three imbalances which we must urgently redress if we are to achieve sustainable economic growth. These challenges are clearly recognisable in Professor Porter's agenda for innovation.

#### 1. DUTCH COMPANIES INVEST TOO LITTLE IN R&D

\_Investing in R&D is something companies must do for themselves. The role of the Ministry of Economic Affairs is to reduce those thresholds which deter companies from making these investments. My innovation policy also gives priority to cooperation in R&D between companies, and between the private sector and research institutes. This will help to implement our cluster policy. During the panel discussion that followed the lecture, I underlined the

importance of continuing the cluster policy by remarking that this is not something the government can do by itself. According to Professor Porter, companies must play much more of "a leadership role in cluster efforts". I therefore challenge them to do just that.

## 2. SCIENTIFIC KNOWLEDGE CAN BE USED MORE EFFECTIVELY

\_The supply of, and demand for, knowledge is not adequately matched. Our universities and researchers are highly regarded, but all this brain power is not leading to enough market-orientated innovation and new industry. This is because scientists are primarily valued according to their scientific publications. Why not also according to ideas they generate which are picked up and applied by companies and organisations? When allocating funding to universities and research institutes, we should also take more account of the social and economic impact of their research.

\_We must move towards a more flexible system in which the allocation of funding is more closely related to agreements concerning output. And part of that output includes the degree to which knowledge is picked up and applied by society and the private sector. To improve the return on public investments in knowledge, I would therefore argue for a more dynamic research system through the introduction of more competition, a more flexible deployment of financial resources and more public-private partnerships in the sphere of research. Professor Porter's call for a change of attitude among scientific researchers and managers is a key precondition for this.







### 3. WE HAVE A SHORTAGE OF RESEARCHERS

\_There has been a slowdown in the growth of talented young researchers in this country, especially in the field of science and technology. In statistical terms, the Netherlands lies well below the EU average. We will need to do our utmost to solve this problem in cooperation with the education and research institutes. This means putting more effort into encouraging young people to opt for a research career in technology subjects, improving the career outlook of university and non-university researchers alike, increasing the knowledge potential of women and attracting more researchers from abroad by expanding opportunities for immigration.

#### WE MUST ACT NOW!

\_The key to removing these shortfalls lies mainly with parties outside government. That is not to say the government will simply stand on the sidelines. Where it can play a role, it will certainly do so.

\_Our goal is well-known: we want to be among the front-runners. We want to play in the first division of competing knowledge-based economies. And we want this not just for the Netherlands, but also for the European Union as a whole. We concluded specific agreements on this at our summit in Lisbon. The big challenge now, however, is to turn those commitments into practical achievements. To remove the shortfalls mentioned, we must make reforms. But because we have been doing so well over the past few years, not everyone recognises this.

\_But if we fail to act **now**, our prosperity growth will come to a standstill, according to Professor Porter. By 'us', I do not just mean the government but also companies, researchers and the managers of research institutes and intermediary organisations. Dedication and commitment from **all** our knowledge partners is crucial if we are to achieve real success. This presents us with a new challenge. If the 'polder model' stands for a **joint approach** to tackling problems, then there is certainly still much to be gained from it. In an 'innovated form', the polder model can lead us towards a new future of sustainable economic growth.







**\_On December 3, 2001, Professor Michael E. Porter delivered the annual 'Innovation Lecture' organised by the Ministry of Economic Affairs.**

Professor Porter is the Bishop William Lawrence University Professor, based at Harvard Business School, and a leading authority on competitive strategy and international competitiveness. Professor Porter co-chairs the Global Competitive Report, a collaboration of Harvard University and the World Economic Forum. This Report analyses the state and causes of competitiveness and innovative capacity in over 70 countries around the world. Some of the data used in Professor Porter's speech comes from the Report. Professor Porter teaches strategy and economic policy and also leads a workshop for newly appointed chief executive officers of major corporations. In addition, Professor Porter serves as a strategy advisor to leading U.S. and international companies, as well as to various governments worldwide. A widely-read author and commentator, he has published some 16 books and over 75 articles, in addition to a series of influential competitiveness reports at the national and regional levels.

\_In his speech, Professor Porter addressed the competitiveness and innovation performance of the Netherlands. While acknowledging that the Netherlands' economy has performed well, he believes that this prosperity may not be sustainable because its foundations are weak. Professor Porter's recommendations include replacing the country's traditional industrial policy with cluster-based development and redirecting the country's policy approach to science, technology, and innovation. He stresses the need to place greater emphasis on R&D, and to reorient and increase the level of collaboration between government, businesses and universities.





# INNOVATION AND COMPETITIVENESS: FINDINGS ON THE NETHERLANDS <sup>(1)</sup>

## IS THE NETHERLANDS' PROSPERITY SUSTAINABLE?

\_For at least the past decade, the Dutch economy has performed well, with high growth rates, substantial job generation and a significant reduction in unemployment. However, the model that produced this success is reaching the end of its life. The Dutch model essentially held down wages and kept costs low to make the Netherlands an efficient place to do business. There are reasons to suspect that this model is no longer sustainable.

\_In order to sustain its success, the Netherlands needs to shift from an approach based on low cost and efficiency to one based on innovation and dynamism. To see why this is necessary, we must understand the fundamental sources of long-term success in an economy, especially as they relate to the role of innovation .

\_The Netherlands has also benefited from the relative slowness of its European neighbours in improving their competitiveness. However, the country will no longer be able to enjoy this advantage. As the Euro is adopted and a nation's currency is no longer a variable that can be manipulated, competitive pressures are going to build inexorably in all European countries. Productivity growth is going to have to be stepped up and there is going to have to be more innovation.

(1) Dr. Veronica Ingham and Dr. Christian Ketels of the Institute for Strategy and Competitiveness contributed greatly to the research underlying this lecture.

- A nation's standard of living (wealth) is determined by the **productivity** with which it uses its human, capital, and natural resources. The appropriate definition of competitiveness is productivity.
  - Productivity depends both on the **value** of products and services (e.g. uniqueness, quality) as well as the **efficiency** with which they are produced.
  - It is not **what** industries a nation competes in that matters for prosperity, but **how** firms compete in those industries.
  - Productivity in a nation is a reflection of what both domestic and foreign firms **choose to do in that location**. The location of ownership is secondary for national prosperity.
  - The productivity of **"local"** industries is of fundamental importance to competitiveness, not just that traded industries



- Nations compete in offering the **most productive environment** for business
- The public and private sectors play **different but interrelated roles** in creating a productive economy

Figure 1: Sources of Rising Prosperity



## THE SOURCES OF NATIONAL PROSPERITY

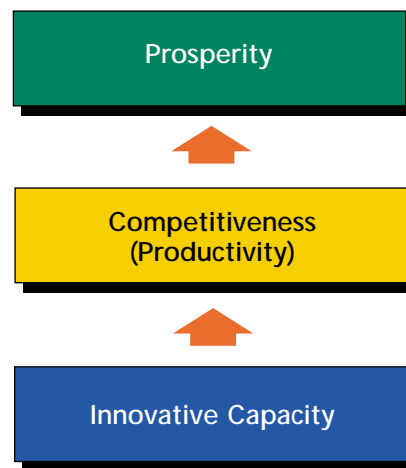
\_Over the past 10 to 15 years it has become clearer and clearer that competitiveness stems from productivity (see Figure 1). Being wealthy, and staying that way, requires that an economy produce a lot of valuable output per day of work and for every euro of capital invested. If a nation is productive, it can afford to pay itself a lot. Low productivity, conversely, means low wages. If a nation is productive, it can earn a good return on the capital invested. Low productivity, however, means scraping by with mediocre returns. If a nation is not constantly improving its productivity, if it is not dynamic, then its improvement in prosperity will eventually grind to a halt.

\_The old model of competing based on the cost of inputs - low wages, low taxes, and cheap capital, for example - could succeed in a less global economy. This strategy, however, has become increasingly ineffective for advanced nations. Today, production can migrate to even lower wage and lower cost locations in developing countries, and capital flows to those regions where an opportunity arises.

\_A nation can improve prosperity for some time without fundamentally improving productivity by adding people to the workforce. GDP per capita can grow even if productivity is not rising very rapidly. This is basically what has been happening in the Netherlands. However, Dutch productivity has not grown rapidly enough to sustain a rising standard of living. Now the country has reached full employment and its old economic model is starting to show signs of stress.

\_A country's economic success is determined not by **what** industries a nation competes in, but by **how** it competes in them. A country that competes in very productive ways with lots of skill and technology, can be prosperous in virtually any field.

\_A nation's prosperity depends on its ability to create an environment in particular fields in which its resources can be used productively. If a country



- Innovation is **more than just scientific discovery**
- There are **no low-tech industries**, only low-tech firms

Figure 2: Innovation and the Standard of Living

can create such an environment, not only will it prosper but firms from other countries will gravitate to it and establish operations to tap into this productive potential.

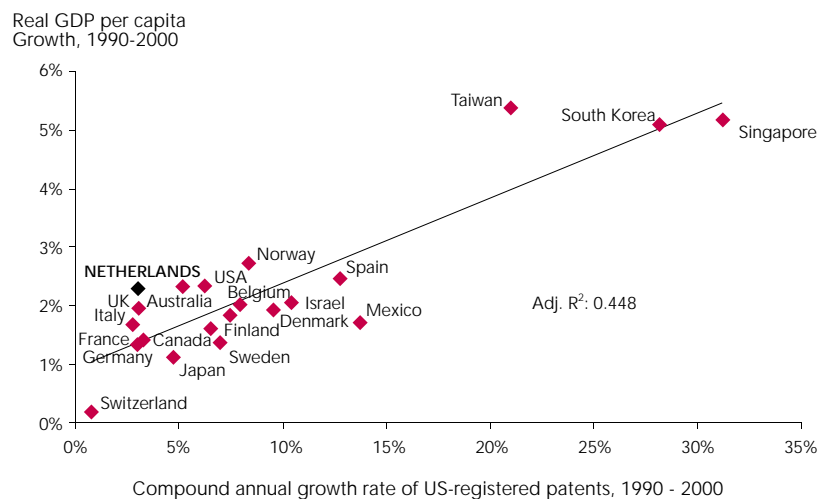
### INNOVATION PROMOTES PRODUCTIVITY GROWTH

\_What causes productivity to increase? Productivity fundamentally increases through innovation. Innovation involves more than just science and technology. It also involves improvements in marketing, service, branding, and the way a product is delivered to the customer. Innovation drives productivity, which increases wages and returns to capital. Over time, standard of living rises (see Figure 2). This is no quick fix, however. It can take years for investments in innovative capacity to translate themselves into new products, processes, and companies that will propel an economy forward.

\_The United States illustrates this point. Its economy has received an enormous boost from the information technology revolution. This started 30 or 40 years ago with some basic investments in U.S. universities by government, and it took a number of years for these to produce a series of technologies, including the Internet, that allowed a sustained increase in productivity growth. That is the way to attain sustainable economic growth: you nurture innovation, which leads to increased productivity, which leads to a rising standard of living.

\_The relationship between prosperity, productivity, and innovative capacity is becoming even more important in the new century. Most advanced countries are facing demographic changes that are slowing the growth of their workforce. Traditionally, one of the factors that fuelled economic growth in many countries was a **growing** workforce. Going forward, continued economic growth will require an increasingly **productive** workforce, which can only be achieved through innovation.





Note: \* The share of a country's patents filed between 1994 and 1998 that were highly cited in 1999.  
Source: CHI Patent, National Science Foundation and Council on Competitiveness data. Author's analysis.

Figure 3: Relationship between GDP Growth and Patenting  
Selected Countries, 1990 - 2000



## INNOVATION INVOLVES ALL INDUSTRIES

\_It is important to understand that innovation is not just restricted to a few high-tech industries. There are no low-tech industries, only low-tech firms. Virtually every industry today can employ highly advanced technology to improve its efficiency and products. There has been a tendency in the Netherlands to think that only few firms and industries need advanced technology. That mentality is fundamentally dangerous. To have a high and rising standard of living, the Netherlands must increase its rate of innovation across the board. There's considerable reason for concern about the innovative capacity of this country. It has not been a fundamental constraint over the last decade, but it is going to be.

## PATENT GROWTH IN THE NETHERLANDS

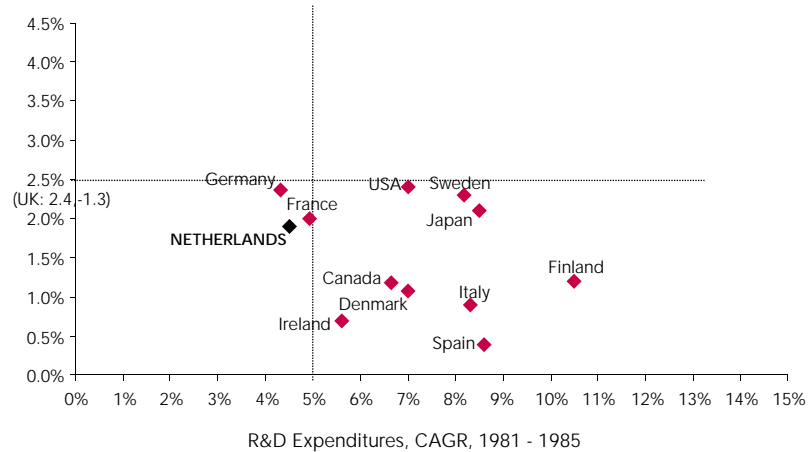
\_Because of the technological sophistication of the United States, patenting in the U.S. is a good test of international innovative capacity. A Dutch technology with significant commercial potential is very likely to be patented in the U.S. As can be seen in Figure 3, the Netherlands is a lagging patenting performer. The rate of patenting per capita is relatively low and, more ominously, its growth rate is low. Moreover, there is usually a strong relationship between the per capita GDP of a country and patent growth. Although the growth performance of the Netherlands' economy has been strong, the country's rate of innovation raises questions about its future potential.

## R&D INVESTMENT

\_One of the most important reasons for the low rate of innovation in the Netherlands is the country's rate of R&D investment, as seen in Figures 4 and 5.

\_In 1985, Dutch R&D spending was quite high but its R&D growth over the early 1980s was relatively low. These trends continued, so that by 1998, the Netherlands had markedly lost position.

R&D Spending as  
Share of GDP, 1985



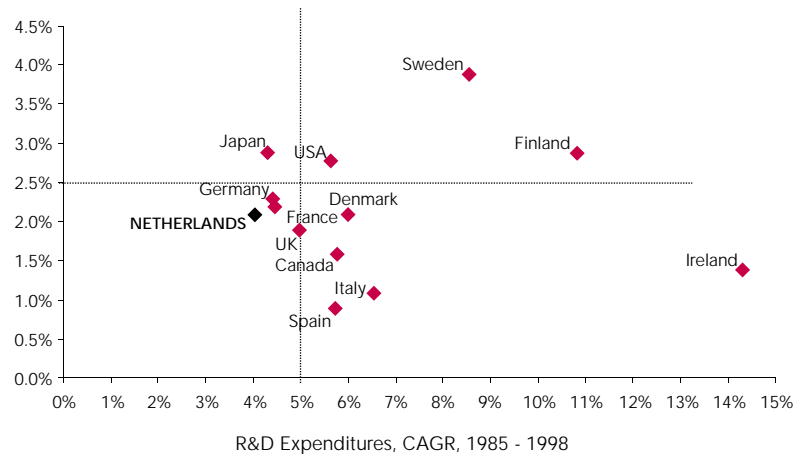
Source: US Competitiveness 2001: Strengths, Vulnerabilities, and Innovation Priorities Report; Global Competitiveness Report 2000, OECD 1999

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Figure 4: **Change in R&D Investments**  
**Compound Annual Growth Rate in R&D Expenditures, 1981 - 1985**

R&D Spending as  
Share of GDP, 1998

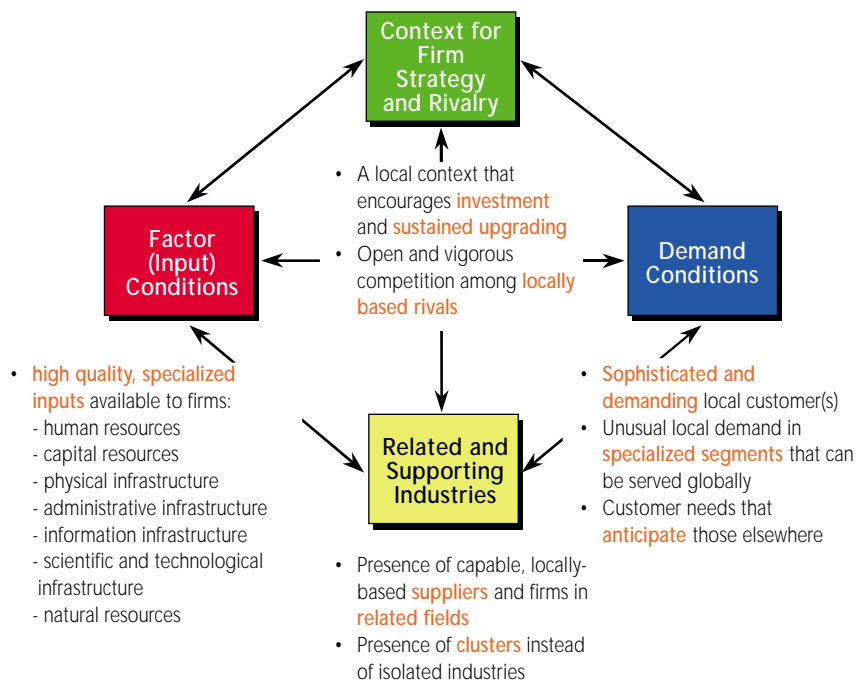


Source: US Competitiveness 2001: Strengths, Vulnerabilities, and Innovation Priorities Report; Global Competitiveness Report 2000, OECD 1999

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Figure 5: **Change in R&D Investments**  
Compound Annual Growth Rate in R&D Expenditures, 1985 - 1998



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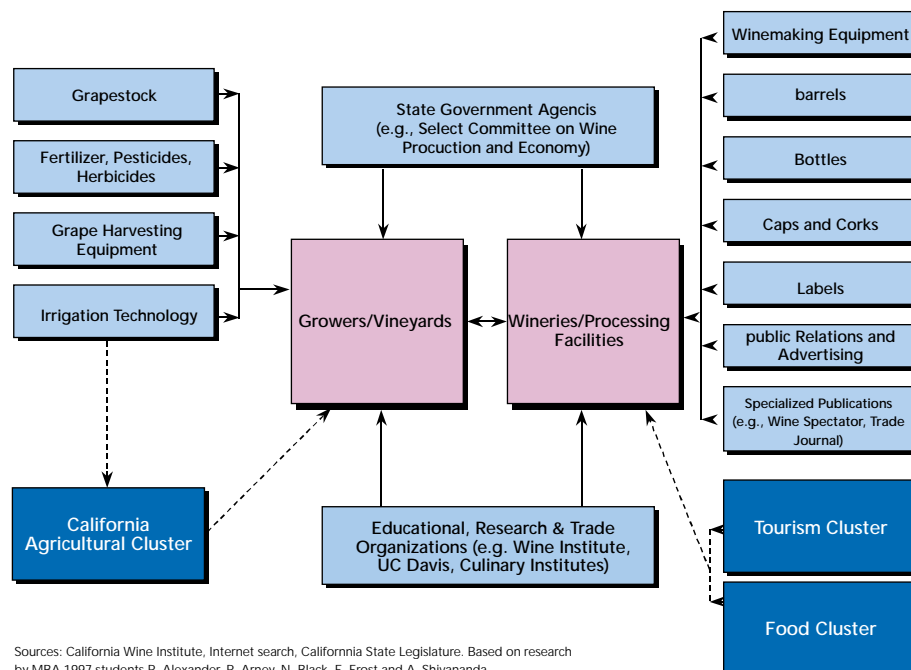
Figure 6: Sources of Productivity  
The Microeconomic Business Environment

## THE IMPORTANCE OF CLUSTERS

\_The picture that emerges is clear: the patenting output in the Netherlands has been lagging, and a main reason seems to be the low investment in innovative activity. To understand why this has occurred, we have to consider what we have learned about innovation over the last decade or so. The first major lesson is that while the environment for innovation and productivity growth requires stable and sound macroeconomic policies, the real impetus comes from the microeconomic level - specifically, from clusters.

\_Innovation involves more than R&D spending per se. It is also strongly influenced by the presence of 'clusters,' - geographically proximate groups of interconnected companies and associated institutions in a particular field. Clusters thrive where there is a high-quality microeconomic business environment (see [Figure 6](#)).





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Figure 7: The California Wine Cluster



\_An example is the California Wine cluster, as illustrated in Figure 7. A small number of counties in California produce around 96 percent of all the wine produced in the United States. Approximately 400 wineries constitute a part of the cluster which also includes a range of suppliers that provide related products, such as the grapes, grape stock, fertilisers, barrels, bottles, caps, and so on.

\_Specialized service providers such as advertising and public relations are also part of the cluster, as are institutions such as universities with departments or programmes relevant to wine. For example, every branch of the University of California has a degree programme in winemaking, and the University of California at Davis has a substantial research programme in wine-related technologies. As a result, the wine companies learn from the universities and vice-versa.

\_Clusters provide an environment and combination of assets, institutions, and knowledge that tend to produce extraordinary rates of innovation. How does this occur? It is easier to perceive opportunities and develop ideas if you are right in the middle of the action with a group of leading companies and suppliers nearby. What makes a cluster even more important is that it is a place where it is easier to commercialise new ideas. New ideas can be introduced to the market without a company having to take the risk of doing it all itself.

\_Clusters, therefore, nurture the fundamental conditions that allow innovation to take place, as shown in Figure 8. They tend to stimulate the growth of sophisticated and trained workforces, as well as the development of knowledge and technology in that particular field. As a result, when a cluster develops, it tends to export not only the product but also intellectual capital and technology.

#### Clusters Increase Productivity / Efficiency

- Efficient **access** to specialized inputs, employees, information, institutions, and “public goods” such as training programs and training institutions
- Ease of **coordination** across firms
- Rapid **diffusion** of best practices
- Ongoing, visible **performance comparisons** and strong incentives to improve vs. local rivals

#### Clusters Stimulate and Enable Innovations

- Better ability to perceive **innovation opportunities**
- Presence of multiple suppliers and institutions to assist in **knowledge creation**
- Ease of **experimentation** given locally available resources

#### Clusters Facilitate Commercialization

- Opportunities for **new companies** and **new lines of established business** are more apparent
- Lower **barriers to entry** into cluster related businesses because of available skills, supplies, etc



- Competition is fundamentally enhanced by **externalities, linkages, and relationships** across firms, industries and associated institutions

Figure 8: Clusters and Innovation



General
<ul style="list-style-type: none"> <li>• Chambers of Commerce</li> <li>• Professional associations</li> <li>• School networks</li> <li>• University partner groups</li> <li>• Religious networks</li> <li>• Joint private/public advisory councils</li> <li>• Competitiveness councils</li> </ul>
Clusters-specific
<ul style="list-style-type: none"> <li>• Industry associations</li> <li>• Specialized professional associations and societies</li> <li>• Alumni groups of core cluster companies</li> <li>• Incubators</li> </ul>

- Institutions of collaboration are **formal and informal organizations** that
  - facilitate the exchange of information and technology
  - foster cooperation and coordination
- They can improve the business environment by
  - creating **relationships** and the level of trust supporting them
  - encourage the definition of **common standards**
  - facilitate the organization of **collective action**
  - support the definition and communication of **beliefs and attitudes**
  - providing mechanisms to develop a common economic or **cluster agenda**

Figure 9: Institutions for Collaboration

## INSTITUTIONS FOR COLLABORATION

\_Innovation also benefits from the presence of institutions of collaboration. In the old model of economic development, there was a clear distinction between government, business and universities: government ran the economy, businesses competed, and universities taught students and conducted research.

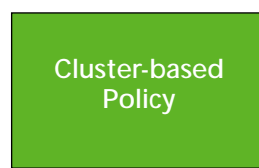
\_In modern competition, these traditional roles have merged and there is a heightened need for interaction between government, business and universities. Institutions for collaboration help this interaction to take place by building links between various parts of a cluster and facilitating the transfer of ideas (see Figure 9).

These institutions often fall somewhere in between the private and public domains. They include such organisations as chambers of commerce, professional associations, industry associations and even informal networks such as university alumni groups.

## INDUSTRIAL POLICY VS. CLUSTER-BASED DEVELOPMENT

\_It is important for policymakers in the Netherlands to clearly distinguish between industrial policy and a cluster-based development process. A frequent response to the cluster concept is: "We already tried that - we targeted particular sectors and supported them and it didn't work." However, cluster-development is not just another name for industrial policy. Quite to the contrary, as demonstrated in Figure 10 industrial policy is about picking winners, favouring domestic companies, and intervening in competition by means of subsidies or other forms of intervention. In the Netherlands, as elsewhere, industrial policy has distorted and impeded competition.

\_Cluster-based economic development departs significantly from industrial policy. It is not about picking winners, but about enhancing productivity in every field. Cluster development is inclusive: it can encompass all parts of



- Target desirable industries / sectors
- Focus on domestic companies
- Intervene in competition (e.g., protection, industry promotion, subsidies)
- Centralizes decisions at the national level



Distort competition

- All clusters can contribute to prosperity
- Domestic and foreign companies both enhance productivity
- Relax impediments and constraints to productivity
- Emphasize cross-industry linkages/ complementarities
- Encourage initiative at the state and local level



Enhance competition

Figure 10: Cluster Policy versus Industrial Policy



an economy and embodies both domestic and foreign companies. Clusters help create an environment that is productive, attracts people with the right skills, and provides a good supplier base and research organisations. Instead of distorting competition, cluster development raises the level of competition for all the participants.

### HOW TO IMPROVE INNOVATION IN THE NETHERLANDS

\_As a nation, the Netherlands has competitive advantages and disadvantages. Dutch firms are strong in distribution, serve broad international markets, employ sophisticated production processes, among other strengths. However, the country falls behind in uniqueness of product design, capacity for innovation, and company spending on R&D. In Dutch industry, there seems to be a characteristic approach to competing on efficiency, but this is one of the reasons behind the country's relatively low innovation output.

Change is needed in at least five areas if the Dutch economy is going to be prepared for the future.

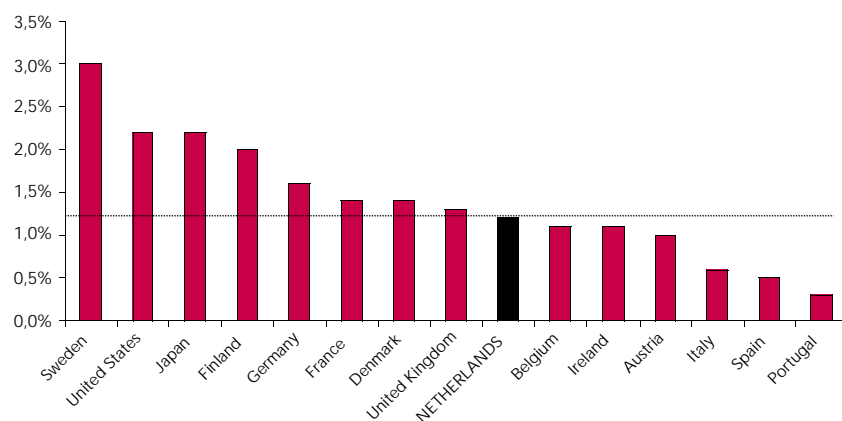
- \_ Increase R&D spending in the corporate sector;
- \_ Produce more science and technology workers;
- \_ Improve the institutional structure for science, technology and innovation;
- \_ Move cluster development from an academic process to a change process;
- \_ Change attitudes towards productivity and innovation.

The country has made progress in some of these areas, but significant improvement is needed in all of them.

#### Increase R&D spending in the corporate sector

\_R&D spending by the Dutch private sector is low, and public sector spending has partially been compensating for this (see Figures 11 and 12). In developing countries, this public sector bias is often necessary, but in an advanced nation like the Netherlands, it is an ominous sign, and will adversely affect innovation in the long run. Both Finland and Sweden have high public

Private R&D Spending as %  
of GDP, 1997



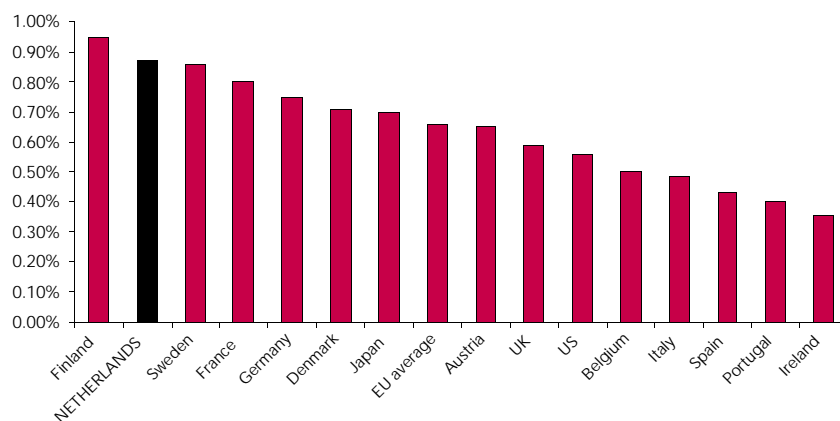
Source: EU Scoreboard

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Figure 11: Company R&D Spending in Selected Countries  
Private Expenditure on R&D, Share of GDP

Public R&D Spending as %  
of GDP, 1998

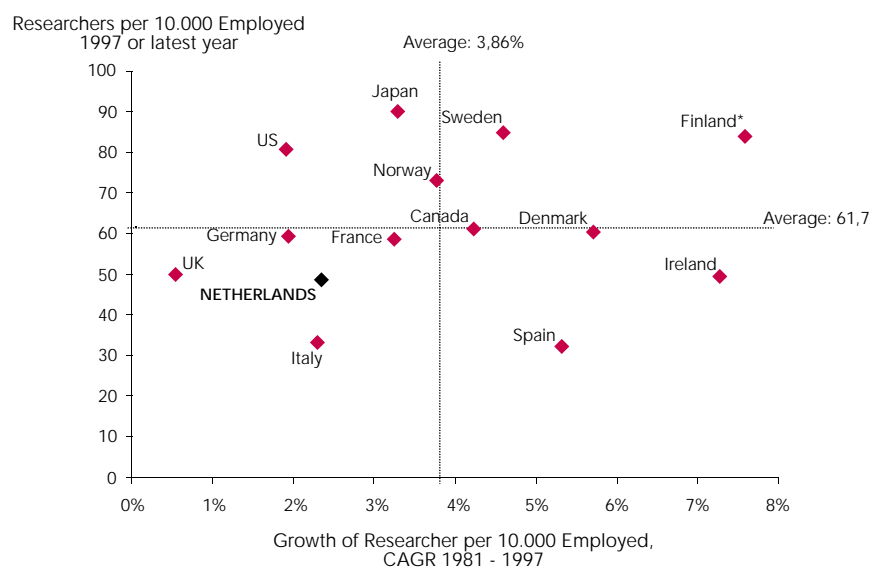


Source: EU Scoreboard

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Figure 12: Government R&D Spending  
Public Expenditure on R&D, Share of GDP



Note: Finnish Growth Rate for 1991-1998  
Source: OECD, 2001

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Figure 13: Prevalence of Scientists & Engineers  
Proportion of Researchers in the Workforce, Selected Countries

R&D expenditures. However, these two countries also have very high private sector spending, so that their combined total is much higher than the Netherlands. The Netherlands has to shift - not by reducing public sector R&D investment, but by boosting that of the private sector. In addition, the Netherlands needs to improve the way it spends its public R&D money.

\_There are various reasons why Dutch private sector investment in R&D is below the desired level. One is the widely held belief that the Netherlands is a service economy and thus does not have to spend much on R&D. However, many other countries with even greater service sector shares of GDP have substantially higher levels of R&D spending. A more important reason why Dutch companies are not investing more aggressively in R&D is that this is not part of their strategy. The traditional strategy of Dutch companies has been to be low-cost and efficient in producing relatively standard products and services. In a region where there are many lower-cost locations, especially in Eastern Europe, this cost-based model is losing its relevance. Instead, it will be necessary to shift to a more technologically based model with sophisticated products and processes. This will require stepped up R&D spending.

### **Produce more science and technology workers.**

\_Science and technology is not attracting enough young people in the Netherlands. **Figure 13** illustrates the lagging prevalence of Dutch scientists and engineers in the workforce, compared to other countries. The public school system is not equipping or motivating students in science and technology, and not enough women are enrolling in this field. The country must address this problem because such skills are increasingly becoming the determining factor for economic success.

### **Improve the institutional structure for science, technology, and innovation**

\_The list of the top Dutch holders of patents issued between 1996-2000 leads to some immediate observations (see **Figure 14**). Universities are far

Rank		Total Patents, 1996-2000	Rank	University	Total Patents, 1995-1999
1.	U.S. PHILIPS CORPORATION	1.698	1.	University Of California	1.585
2.	AKZO NOBEL N.V.	226	2.	Massachusetts Institute Of Technology	605
3.	SHELL OIL COMPANY	174	3.	University Of Texas	444
4.	DSM N.V.	125	4.	Wisconsin University	339
5.	KONINKLIJKE PTT NEDERLAND N.V.	89	5.	Stanford University	335
6.	MEDTRONIC INC.	80	6.	California Institute Of Technology	299
7.	OCE-NEDERLAND B.V.	53	7.	Johns Hopkins University	275
8.	GENERAL ELECTRIC COMPANY	52	8.	Cornell University	266
9.	CORDIS CORPORATION	39	9.	University Of Pennsylvania	253
10.	OCE-TECHNOLOGIES (office equipment), B.V.	38	10.	State University Of New York	217
11.	GIST-BROCADES, B.V.	37	11.	University Of Michigan	209
12.	LEVER BROTHERS COMPANY	37	12.	Iowa State University	208
13.	LUCENT TECHNOLOGIES INC.	35	13.	Michigan State University	200
14.	VITATRON MEDICAL B.V.	35	14.	Columbia University	196
15.	BERG TECHNOLOGY, INC.	34	15.	University Of Minnesota	180
16.	NEDERLANDSE ORGANISATIE VOOR TOEGEPAST NATUURWETENSCHAPPELIJK ONDERZOEK TNO	34	16.	University Of Washington	173
17.	AGENCE SPATIALE EUROPEENNE	33	17.	Harvard University	164
18.	GIST-BROCADES N.V.	33	18.	University Of North Carolina	154
19.	HOLLANDSE SIGNAALAPPARATEN B.V.	31	19.	Washington University	151
20.	UNILEVER PATENT HOLDINGS B.V.	31	20.	Duke University	139
...			21.	University Of British Columbia	137
45.	RIJKSUNIVERSITEIT LEIDEN	13	22.	North Carolina State University	129
...			23.	University Of Nebraska	122
52.	TECHNISCHE UNIVERSITEIT DELFT	11	24.	University Of Utah	121
...			25.	Penn State University	116
88.	RIJKSUNIVERSITEIT TE GRONINGEN	6			

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Source: U.S. Patent and Trademark Office

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Figure 14: Leading Dutch U.S. Patent Holders  
Total of 1996-2000

Figure 15: Top 25 Patenting Universities  
in the U.S. Total of 1995-1999



down the list, and far behind the top 25 patenting universities in the U.S., over a similar time-period (see Figure 15). The top U.S. university produced 1585 patents, while the top Dutch university produced just 13. To create vibrant innovation and rapid new company formation, and country needs institutions and universities - not just companies - to perform intensive R&D and aggressively disseminate technology.

\_Universities in the Netherlands have traditionally been much less commercially oriented than in the U.S., where commercial activities are more highly regarded. In the Netherlands, universities have little contact with companies, and filing patents and seeking to license technology to the private sector is not part of the culture.

\_In the U.S., universities such as MIT see patents as an important indicator of success. Also, U.S. universities often specialise in particular fields, with the goal of becoming world-class in them. Meanwhile, universities in the Netherlands are more broad-based. Dutch universities are strong, the quality of science and technology is high, and the amount of money the government spends is substantial. The need is to create norms and incentives that will allow universities to provide greater benefits to society. There are just too many barriers standing in the way in the current structure.

### **Move cluster development from an academic process to a change process**

\_The Netherlands has well-developed clusters in areas such as medical equipment, plastics, beverages, and computers. The issue, however, is whether and how clusters are being upgraded and how they are performing (see Figure 16). Cluster development is a long process that involves a series of public and private investments. A particular mindset also helps drive this process. Different parties have to work closely together to enhance competition and innovation, not rely on government subsidies. Subsidies usually do not allow companies to win; they just keep them from dying.



### Strenghts

- An important phenomenon in country's **economic history** (e.g., finance and trade)
- Early adopter of **cluster thinking**

### Challenges

- Much analysis but **limited action**:
  - While policy documents acknowledge the role of clusters in innovation, the cluster approach is not yet central to government innovation policy
  - The private sector is reluctant to assume a leadership role in cluster efforts
  - Companies underestimate the importance of the local business environment
- Few linkages between **clusters and universities** due to the structure of most Dutch institutions of higher learning
  - An exception is the Wageningen Agricultural University and the agriculturally-based clusters
- Limited **coordination among ministries** in the allocation of R&D funds
  - In the field of ICT investments government is trying to develop a more coordinated strategy
- Not enough focus on **emerging fields of knowledge**

Figure 16: Cluster Development in the Netherlands

\_While the Netherlands was an early adopter of cluster thinking, there is still a long way to go to realise it. [Figure 17](#) lists some of the pitfalls that need to be overcome for clusters to develop in any country, including the Netherlands. A major problem in the Dutch case is that there has been a lot of analysis, but not enough action. Although many policy documents have been published, clusters are not yet an integral part of the country's innovation policy. The lack of linkages between clusters and universities can partly be explained by the structure of Dutch higher-learning institutions, the limited degree of co-ordination among government ministries, and the process for allocating R&D funds. It is important that the Netherlands implement cluster thinking to allow the innovation agenda to move forward.

### **Change attitudes towards productivity and innovation**

\_A number of attitudes are hindering co-operation between Dutch universities and companies. First, science is pursued for science's sake and its application is considered of lesser importance. Second, the commercialisation of science is not seen as critical and many believe it threatens the independence of universities. Finally, universities do not recognise the need to establish relationships with industry and fail to see the opportunity to learn from the private sector.

\_These attitudes need to be revisited. In the U.S., researchers and companies see opportunities for productive dialogue and act upon them. The Netherlands needs to follow this example, creating an atmosphere where there is excitement when a scientist comes up with an idea that can have a real impact on society.

- Picking priority clusters
- Government-driven vs. private sector-driven
- Using the cluster concept as a cover for intervention and industrial policy
- Overly broad or overly narrow cluster definitions
- Overly broad or overly narrow geographic area considered
- Orientation towards subsidies or limiting competition
- Ignoring small or emerging clusters
- Attempting to create clusters where there is no foundation

Figure 17: Common Pitfalls in Cluster Development Initiatives

#### THE NETHERLANDS NEEDS TO ACT NOW

\_The Dutch government, business and universities need to address multiple issues immediately in order to create an environment that fosters increased innovation. There is no single panacea. Many steps need to be taken.

\_The final challenge facing the Netherlands is creating the will to act. This can be difficult when an economy is perceived to be performing well. Changes in a nation's strategy and innovation policies are hard to accomplish and take time. Other countries have shown that a fundamental change in attitude towards entrepreneurship, commercialisation and innovation can produce impressive results. Perhaps the greatest challenge facing the Netherlands is to realise that the currently healthy situation is not sustainable, and that the time to act is now.





## PANEL DISCUSSION

PROFESSOR PORTER'S ASSESSMENT OF THE DUTCH ECONOMY WON MUCH INTEREST AND GENERAL AGREEMENT FROM THE INVITED PANEL. AFTER THE SPEECH THEY DISCUSSED PROFESSOR PORTER'S VIEWS.

**Mr. Wijffels, Chairman of the Social and Economic Council,** believed that Professor Porter's analysis was very convincing, adding, "I hope we will indeed start to act."

**Mr. Nieuwenhuis, Director of Strategy and Technology at PinkRocade,** was particularly struck by Professor Porter's remark about Dutch attitudes. "I think as a nation we're not used to being proud about our inventions. That is a great challenge to change this attitude and to be proud of our own capabilities."

**Mrs. Jorritsma, Minister of Economic Affairs,** saw some promise in the fact that the Netherlands has a lot going for it. She accepted that the Netherlands has to proceed with a cluster-based policy, but added that this is not something the government can do alone. "Government wants to play a role. Personally I'm still much more pre-occupied with industrial policy than with cluster-based policy, though I do think we should replace the former with the latter."

**Mr. Bikker, member of the Executive Committee of Euro RSCG worldwide,** believed that more young people have to be stimulated to become entrepreneurs. "At that age, you can influence them and make them enthusiastic about certain skills and fields."



**Mr. Dunn, President and CEO of ASM Lithography**, said, "Professor Porter gave us a wake-up call." Of the five key areas that Professor Porter mentioned, **Mr. Dunn** believed that the most important was attitude. "Celebrating heroes or success stories is good, but we also have to learn to make mistakes. Entrepreneurship and innovation require risk-taking, and we must be more open to that idea."

**Mrs. Jorritsma** continued, "What we have to do is bring people together. We definitely have to do something now and I agree with Professor Porter that it is difficult to do so if things are going relatively well. We as a nation did best when the economy was down in the early eighties. As a result, we have a sound social-economic policy. Now it will be harder to motivate people. It's a challenge."

**Mr. Wijffels** agreed that the Netherlands is under-investing in innovation. "It's a real problem, and in my view we will have to fully redesign the whole fabric of universities and research institutions, and also re-assess how the government funds these institutions. After this, we should adopt the cluster policy, as other countries have successfully done."

**Mrs. Jorritsma** believed that every company in Holland should be challenged to find and form its own cluster. "If a company wants to be innovative and grow, then they should be able to find knowledge institutions that can help. If a university has specific knowledge why not 'sell' it to the private sector?"

**Professor Porter** reiterated that although the Netherlands has nearly full employment and is competitive within Europe, the introduction of the euro will see that relative advantage shrink. "The goal of a country is not to hold down its wages, but to see to it that they continually rise. To do that, its industry must create better products or produce them more efficiently. That is the simple equation of prosperity."

**Professor Porter** expressed doubts about a European-wide science and technology network, saying that regions and countries should instead compete in what they do uniquely well. "You must allocate European resources based on merit and not force a Pan-European collaborative process."

**Mrs Jorritsma** said that European innovation policy is supplemental to, and does not supersede, the Dutch national policy: "The issue, though, is how do we stimulate scientists to move around Europe more and exchange their scientific bases. If there are similar knowledge centres, let's exchange knowledge. In Europe, we also have to break down barriers such as the patent system. We have a dreaded system, where a company needs 15 separate patents to be able to function."

**Mr. Porter** said that he believed the European patent system was unnecessarily costly and a disincentive to patenting. "Intellectual output is an asset and I would advocate the streamlining of the European system to foster the pursuit of intellectual property as a competitive advantage."



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