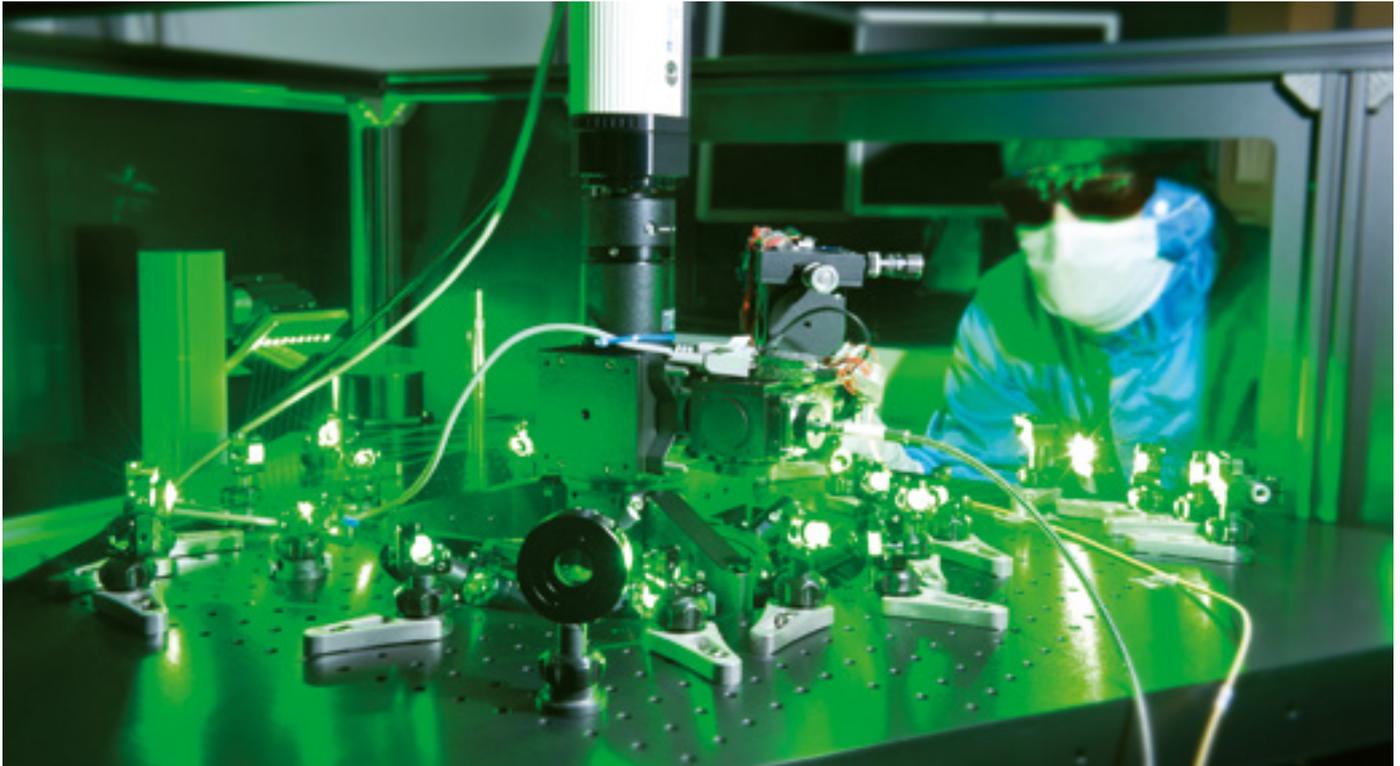


# THE ECONOMY AFTER THE CORONAVIRUS VACCINE: HOW THE NETHERLANDS CAN INNOVATE ITS WAY OUT OF THE CRISIS



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# THE ECONOMY AFTER THE CORONAVIRUS VACCINE: HOW THE NETHERLANDS CAN INNOVATE ITS WAY OUT OF THE CRISIS

Given that it appears that the 'intelligent lockdown' is gradually being eased, more and more attention is being paid to a 'restart', with the question being: how can the Dutch economy emerge from the coronavirus crisis stronger? Our neighbours to the east have actually been increasing investments in innovation since the banking crisis in 2008. Although it took years before the global economy came out of the crisis, Germany experienced a 'golden decade' of rapid economic growth. TNO advocates following the German example, namely that the Netherlands should innovate itself out of the crisis.

It goes without saying that, as far as research is concerned, the highest priority right now must be to resolve the crisis itself, starting with a vaccine against the COVID-19 virus. That is crucial because the longer it takes before a vaccine is available, the greater the economic damage and the more difficult it will be to 'bounce back' out of the dip. It is also entirely logical that the main focus of attention at the moment should be on using government funds to save struggling companies – and therefore people's jobs – wherever possible. At the same time, it is a good idea to think about a structural economic plan by which the Netherlands grow its way out of the crisis, about whether new social issues have come to light during the crisis, what exactly the Netherlands can learn from the German approach to the financial-economic crisis and whether – and if so, how – the Growth Fund must be continued.

## A RESTART: HOW CAN THE NETHERLANDS GROW ITS WAY OUT OF THE CRISIS?

### OUTLINE OF THE SITUATION

The cause of the inevitable recession which is heading our way as a consequence of the coronavirus crisis cannot be compared to the previous economic crisis in 2008. That crisis was caused by problems in the banking system, which in turn caused problems for companies on the supply side of the economy. This time the main cause is primarily a lack of demand caused by government measures resulting from the coronavirus crisis and changes in consumer behaviour. However, the supply side of the market is also being affected because cross-border production chains are being disrupted<sup>1</sup>.

Just as in the previous crisis, the consequence of this is the stagnation of economic activity which is leading to unprecedented shrinkage. Estimates for the Netherlands vary from 7.5% (IMF)<sup>2</sup> to 1.2-7.7% (CPB)<sup>3</sup>, depending on the duration of the intelligence lockdown and the degree of government intervention. As far as the latter is concerned it would appear that governments and the ECB are responding in the same way as over ten years ago. Once again, they are providing loans, buying up debts, or – if their mandate permits – are giving financial support directly to those that have been adversely affected. All of this is intended to limit the structural damage to the economy in the form of bankrupt companies and massive unemployment. Another consequence of this is the rapid increase in (collective) debt.

In any event it is clear that the pandemic may lead to an unprecedented shrinking of the economy<sup>4</sup>, with all the consequences that entails. The big question is: how can the Netherlands climb out of this dip? Drastic austerity measures, as were introduced after 2008, do not, in any event, appear to be the obvious choice given the predicted impact of the current crisis on the economy as a whole. What is more, it would seem illogical for the government first to have spent huge amounts on keeping the economy going, only to follow this with the introduction of drastic cutbacks which would risk negating the effects of the aid it had

just provided. In the medium to long term, economic growth, facilitated by research (and innovation), is essential in order to get out of the (imminent) economic crisis. It is therefore important not only to 'prop up' companies right now, but also to maintain research capacity. It would therefore seem to be a better idea, in due course, to rebalance public finances. However, economic growth is still required in the post-corona era in order to do so.

### THE RECIPE FOR ECONOMIC GROWTH

In theory, economic growth can be generated by increasing labour force participation ('more people in work') or by increasing labour productivity ('creating more value per employee'). Initially it will be possible to increase labour force participation compared to the low point of the crisis. After all, the available employment potential can be redeployed as a result of rising unemployment. However, more is needed for structural growth compared to the situation before the crisis. The labour force participation in the Netherlands was already high. Having said that, the combined effect of an increase in the number of old people and a decrease in the number of young people means that the working population is expected to decline in the coming decades<sup>5</sup>. After all, the growth in labour productivity has been on a downward trend for some time now. While labour productivity in the Netherlands increased during the nineteen-seventies by more than four percent a year, the average in recent years has been around one percent a year<sup>6</sup>.

It is therefore effective to increase labour productivity in order to achieve a structural growth in GDP. That can be done first and foremost by 'capital deepening', in other words more and better machines (quality). In practice this does not appear to be a realistic solution. After all, Dutch companies are already leading the way in this<sup>7</sup>. Another way of increasing labour productivity is through research and innovation. This leads to new or improved products, services and production processes. This in turn creates added value and reinforces the international competitive position of businesses. Consequently, this appears to be, in effect, the only way for the Netherlands to boost labour productivity and, with that, economic growth and to increase GDP.

Research has confirmed that investments in R&D indeed lead to a higher labour productivity and can substantially increase our wealth. According to an analysis referred to in the 'Growth letter to parliament'<sup>8</sup>, one euro extra of R&D at companies in the longer term leads to €4.50 extra growth in our economy. This view is confirmed by a recent study by Rabobank<sup>9</sup>. An investment of €1 extra in public R&D capital – for example research by knowledge institutions – generates no less than €4.20 of added value for society. What is more, investments in private R&D capital – for example research by companies – provide a decent yield of €2.60 of added value for each euro spent. The additional growth in added value for businesses which TNO engages in their R&D is estimated to be between 14 and 17 percent. This means that companies that collaborate with TNO represent a growth in added value which is, on average, 1.14 to 1.17 times the growth of companies which also do R&D, but not with TNO<sup>10,11</sup>.

In the field of research and innovation the Netherlands scores well in many respects but is lagging behind as regards investments<sup>12</sup>. The Netherlands invests 2.18% of GDP in research and development, while a 'peer' and competitor such as Germany<sup>13</sup> is now already investing 3% and has the ambition to grow to 3.5%<sup>14</sup>. Increasing the relatively low Dutch level of investment in R&D therefore offers the opportunity of accelerated economic growth. The Netherlands also has the financial capacity to innovate the economy and gain a competitive advantage. After all, it entered this crisis with a lower national debt than Germany and all other major European economies<sup>15</sup>.

## SOCIAL ISSUES: NEW PRIORITIES?

Within the framework of the innovation and top sectors policy the Netherlands established 'missions' in 2019. These are aimed at finding solutions for social issues in four areas, namely energy transition and sustainability; agriculture, water and food; health and care; and security.

Key technologies such as AI and quantum technology are essential in order to solve social issues because they can push back technological borders and facilitate ground-breaking innovation. According to the Broad Social Reviews [Brede Maatschappelijke Heroverwegingen]<sup>16</sup>, they can lead to breakthroughs in numerous sectors, due to their 'enabling character'. According to the government and the European Commission<sup>17</sup>, key technologies are also important for the 'technological sovereignty' of Europe and the Netherlands, or to limit dependency on tech giants from countries such as the US and China<sup>18</sup>.

Even before the crisis TNO had argued that the Netherlands had to dare to make choices if it really wanted to resolve issues and make us stand out at international level. The advice was to focus on and invest specifically<sup>19</sup> in technologies for the climate and energy task and digitisation (AI, data, cyber, quantum, laser satellite communication) as a key enabler on behalf of the social transitions. Provided that these transitions, such as the energy and climate tasks, are properly organised, they can lead to new opportunities and growth<sup>20</sup>. The Advisory council for science, technology and innovation [Adviesraad voor wetenschap, technologie en innovatie] (AWTI) writes the following on this subject: 'New needs are created during transitions and with that new markets for innovative companies. There are sufficient examples of this. During the digital transition, millions of new jobs were created worldwide. New ways of working, doing business and conducting science were created and different lifestyles became possible. The imminent transitions will also offer opportunities. Increasing demand for sustainable products, services and lifestyles are, for example, already leading to the emergence of new scientific fields, innovation and new jobs.'

The current crisis offers opportunities to realise our climate targets and to capitalise and build on our lead in terms of digitisation<sup>21</sup>. Indeed, digitisation is already making it possible during this crisis to continue some economic activities at home and to organise education online. Further digitisation of society and the business community will make the Netherlands less economically vulnerable in the event of a new pandemic in years to come, provided that the Netherlands (and Europe) do not become dependent on foreign platforms. That is the reason why, for example, TNO is an advocate of the Gaia-X initiative launched by Germany (and France) to create a European data cloud<sup>22</sup>. As far as scientific knowledge in the field of new technology is concerned – for example AI – the Netherlands/Europe can compete perfectly well with superpowers like China and the US<sup>23</sup>. However, the Netherlands/Europe do sometimes fail in terms of its application<sup>24</sup>. It would therefore seem to be more sensible to focus more attention on this<sup>25,26</sup>.

The coronavirus crisis could also lead to new priorities. In recent decades some companies have moved part of their production process to China and other parts of the world with a view to saving costs. The companies in question were not only 'low tech' but also, for example, producers of essential medical articles. The pandemic has revealed how vulnerable and dependent the intercontinental production chains of European companies have become due to globalisation<sup>27</sup>. Consequently, there is an expectation that European companies, possibly incentivised by governments, will shorten their production chains and move their production capacity and jobs back to the countries of origin ('reshoring')<sup>28</sup>. This applies in particular to vital sectors such as medical technology and technologies which are critical for our ICT infrastructure. New sustainable, circular technologies, for which few materials and energy are required, will contribute significantly to creating autonomous production. Recent examples have shown that new technology, such as robotics in combination with 5G technology, is essential in order to facilitate reshoring<sup>29</sup>. The ambition should also be to use innovation to make production processes which are relocated back to Europe immediately more sustainable and circular, with less waste and less use of raw materials from outside Europe. In short, besides 'technological sovereignty', (European) 'production sovereignty' could also become a feature of innovation policy<sup>30</sup>.

## INNOVATION POLICY IN A TIME OF CRISIS

Research and innovation are therefore the ideal recipe for economic growth. However, the question is: how can the innovation policy be organised in a time of crisis? What can we learn from our neighbours to the east who experienced spectacular growth following the credit crisis (2008-2014) and how should the Growth Fund be used?

### GERMANY: CONTINUOUS INVESTMENTS IN INNOVATION

The years following the banking crisis are going to be referred to as the 'golden decade' in Germany. How was the German economy able to grow so quickly, while the global economy was taking such a hit? The answer to this question consists of two words: 'innovation' and 'continuity'.

In the decade after 2008, the German economy became a leading innovation machine. Unlike other major Western economies, the country consistently followed an ambitious innovation strategy. In order to address the consequences of the banking crisis, the Netherlands opted for drastic cuts in 2008 and the subsequent years, including in research and innovation<sup>31</sup>. In contrast to the Netherlands, private and public R&D spending in Germany was actually increased from 2008 onwards and exceeded 3% in 2017<sup>32</sup>. Both the government and the business community are taking their responsibility.

The German R&D policy is characterised by continuity and a long-term vision. Agreements regarding investments in research and education are not being reversed under the pressure of budget cuts<sup>33</sup>. The 'Pact for Research and Innovation', which was entered into in 2005, has been extended to 2020. In this Pact, German government bodies agreed to increase the basic financing of knowledge institutions by 3% per year<sup>34</sup>. Whereas Germany is going to invest 3.5% of GDP in R&D, TNO advocates that the Netherlands increase its policy target during the new parliamentary term from 2.5% to 3%. However, the most important lesson to be learned from the Germans success is not the level of R&D investments, but the continuity. Consistently investing in R&D leads to economic growth and investing precisely in times of crisis as well enables a country to climb out of the economic doldrums and take a lead.

### THE GROWTH FUND

In order to increase the earning capacity<sup>35</sup> of our economy in the long term, the government intended to set up a growth fund. Funds which the state can loan out on the basis of attractive conditions would then be invested in infrastructure, innovation and talent. Since the coronavirus crisis the preparations for this have been put on the back burner. The question is: should the fund be terminated or actually continued?

With the German example in mind, TNO is proposing a rapid increase in the post-corona level of investment in R&D so that we can 'innovate out of the crisis'. Whether that takes the form of a growth fund is secondary and is, above all, a political choice. Firstly, we argue that, in any event, a growth fund should not be at the expense of the basic financing of knowledge institutions. Secondly, we advocate focusing on specific research that can lead to economic activity within a couple of years (max four years) and can therefore contribute to our earning capacity. Now that all the stops are having to be pulled out to get the economy up and running again, it would appear to be sensible for additional research to focus more strongly on the short term. That would also offer a solution for the problem that the Netherlands has been struggling with for years, namely a lack of success when it comes to turning knowledge into value (application). Thirdly, TNO advocates using resources primarily for investments in key technologies<sup>36</sup>. Lastly, we want to warn against yet more governance and bureaucratic obstacles. From that perspective, it may be sensible to make a Growth Fund structural in nature and to include it in the national budget. This would prevent the government having to set up yet a new scheme which may lead to a delay, further fragmentation of the set of instruments and high transaction costs and a greater administrative burden<sup>37</sup>.

## CONCLUSION

Increasing labour productivity post-coronavirus by means of targeted investments in research and development is the ultimate recipe for economic growth for the Netherlands. Since 2008 Germany has shown how, against the odds, an economy can grow out of a crisis by consistently investing in R&D. TNO advocates increasing investments in R&D during the new parliamentary term, in line with the German example.

# FOOTNOTES

- 1 Examples are the problems which companies such as ASML, Philips and IKEA have experienced in their intercontinental supply chain.
- 2 <https://nos.nl/artikel/2330453-imf-zware-klap-wereldeconomie-door-corona-in-nederland-7-5-procent-krimp.html>: 'The open and consequently vulnerable Dutch economy is having a tough time and is shrinking by 7.5 percent. The IMF has said that economic forecasts are extremely uncertain. In the basic scenario the pandemic disappears in the second half of this year and the global economy grows again in 2021 by an average of 5.8 percent, helped by all the government support. However, that is far from certain. If the pandemic lasts for longer, there will be more damage and the global economy will shrink by a further 8 percent in 2021.'
- 3 <https://www.cpb.nl/scenarios-coronacrisis>
- 4 <https://www.rijksoverheid.nl/ministeries/ministerie-van-financien/nieuws/2020/04/24/begroting-2020-flink-negatief-bijgesteld-een-eerste-beeld> 'The first rough estimate for 2020 predicts a deficit of 11.8 percent of GDP (92 billion euros). That is the best estimate that can currently be made, but it is shrouded in huge uncertainty and we know that things will change during the course of the year. The rough estimate of the EMU debt is 65.2 percent of GDP.'
- 5 See for example:
  - <https://themasites.pbl.nl/uitenlopende-paden-potentiele-beroepsbevolking/> PBL – 'Diverging pathways: The potential working population in the 22 urban areas, now and in the future': 'While the trends in the extent of the potential population differ between the urban areas, the same does not apply to the share. The proportion of people of working ages is gradually decreasing. Since the turn of the century, this proportion has decreased slightly in almost all urban areas. In the near future, the trend will initially start reversing slightly because the extension of the retirement age limit will cause an increase in the proportion in almost all urban areas (with the exception of Amsterdam). Later, however, we will see the start of a significant decline in around 2025.'
  - <https://www.cbs.nl/nl-nl/nieuws/2018/51/prognose-18-miljoen-inwoners-in-2029> Statistics Netherlands (CBS) Prognosis: 18 million inhabitants in 2029, 18 December 2018. 'The number of people aged between 20 and 65 will drop from 10.1 million now to 10 million in 2030. The proportion of this age group in the population will fall from 59 percent to 56 percent.'
  - <https://www.mejudice.nl/artikelen/detail/50-miljard-euro-investeren-in-onderwijs-en-innovatie-verdubbelt-economische-groei>. 3 October 2019, Hugo Erken/Jesse Groenewegen. 'What is striking is that, from 2025 onwards, the effect of ageing will have a strong negative impact on the Dutch growth capacity of -0.3 percentage points per year. In our calculations, this effect is not due to a decrease in the number of hours per working person or a declining employment rate but is instead the consequence of a changing demographic. [4] After all, ageing leads to a significant decrease in the number of people of working age in the age range of 15 to retirement age.'
- 6 Broad social review of the 'Innovative society', 20 April 2020, p. 7.
- 7 <https://economie.rabobank.com/publicaties/2019/oktober/50-miljard-euro-investeren-in-onderwijs-en-innovatie-verdubbelt-economische-groei/> 'Here we look at the effects of 50 billion of extra investments in innovation and education. We are explicitly not opting to invest some of this amount in fixed assets. The total stock of capital goods (everything from office buildings and machines to roads) in the Netherlands amounts to more than 2,000 billion euros. A package of 50 billion euros is, by comparison, a drop in the ocean. Based on an indicative calculation we have carried out, the return on a single euro extra of capital goods therefore appears to generate, on average, [5] only 9 cents of added value for society'.
- 8 Letter to parliament about the growth strategy for the Netherlands in the long term, 13 December 2019
- 9 <https://economie.rabobank.com/publicaties/2019/oktober/50-miljard-euro-investeren-in-onderwijs-en-innovatie-verdubbelt-economische-groei/> 'It follows from the same calculations (see Erken, Groenewegen and Van Es, yet to be published) that investments in public R&D capital, for example the financing of fundamental research as carried out by universities or other public knowledge institutions gets the most 'bang for the buck'. Each euro spent on this generates no less than 4.20 euros. [6] What is more, investments in private R&D capital, i.e. expenditure on research in the private sector and education, also generates an excellent return, namely 2.60 and 1.30 euros respectively for each euro spent'.
- 10 <https://www.tno.nl/nl/tno-insights/artikelen/tno-heeft-positieve-impact-op-bedrijvigheid/>.
- 11 See also FD.nl, 5 August 2019: 'Research and development are important for companies. 'It is becoming ever clearer that companies' competitiveness is being determined increasingly by their technological performance and capacity to innovate', explains Alexander Kron. He is a partner at the German branch of EY that carried out the research. Investors are also keeping an ever closer eye on this indicator. EY has expressed its concern about the extent to which those European companies are at risk of falling behind. Indeed, they (of which there were 142) increased their R&D budgets in 2018 by 6% compared to 2017. That is half as much as American companies (of which there were 141), that increased their expenditure on innovation by 12%. According to EY that investment will pay off. Because American companies are investing more, they are recording considerably higher margins and stronger profit growth. Top Chinese companies (44) are the leader in terms of growth because they spent 23% more than in the previous year. High innovation expenditure is not, incidentally, synonymous for innovation or market success.
- 12 <https://www.rathenau.nl/totale-investeringen-wetenschap-en-innovatie-2018-2024> Together with the other countries within the European Union, the Netherlands has agreed to invest more in R&D. In 2020 the government, business community and other parties would have to spend 2.5 percent of gross domestic product (GDP) on this in the Netherlands. In the most recent year for which all data is available, this percentage was 2.2. In order to reach 2.5% in the Netherlands, all parties together would have to spend around 4.8 billion euros more on R&D every year. If the government, the business community and other financiers were to contribute as much as they do now in relative terms, that would require extra government funding of 1.4 billion euros annually. That is one and a half times the 0.86 billion euros extra budgeted for this year.
- 13 In 2010 the German government spent 12 billion on R&D which, given that their GDP is around 3,400 billion, is approximately 0.35%. The federal states contributed 0.27% and the business community 1.32%. This gives a total, therefore, of almost 2% (70 billion). Of the total of 70 billion invested in R&D in Germany, 67% was spent within the industry, 18% was spent on academic institutions and 15% (10 billion) on non-academic institutions (applied). That 15% of the total R&D investment in applied research in Germany is reasonably comparable to 13% in the Netherlands. However, the 18% of the total R&D investment in academic research in Germany is much lower than the 40% in the Netherlands. Industry in Germany contributes a lot more (67% in total) than industry in the Netherlands (47%).
- 14 Rathenau, 12 November 2019.
- 15 <https://www.businessinsider.nl/nederland-staatsschuld-2019/>
- 16 Brede maatschappelijke heroverweging 'Innovatieve samenleving', 20 april 2020, p. 8.
- 17 De Commissievoorzitter bepleitte dit ook: [https://ec.europa.eu/commission/presscorner/detail/nl/IP\\_19\\_5542](https://ec.europa.eu/commission/presscorner/detail/nl/IP_19_5542).
- 18 Letter to parliament about the Mission-Driven Innovation and Top Sectors Policy, 26 April 2019.
- 19 Broad social review of the 'Innovative society', p. 39. 'Given the current relationship between generic and specific innovation policy, the advice of international organisations has, for years, been that, in particular, more specific investments in knowledge and innovation are needed. Specific policy is intended to create a greater focus and mass on a specific domain, with the government allowing sufficient space for bottom-up solutions by the business community and knowledge institutions.'
- 20 AWTI, Reinforce the role of science, technology and innovation in social transitions, February 2020, p. 11.
- 21 <https://www.rijksoverheid.nl/actueel/nieuws/2019/06/12/nederland-in-top-3-eu-ranglijst-digitale-economie>
- 22 <https://fd.nl/economie-politiek/1327621/duitsland-vraagt-om-nederlandse-steu-bij-bouw-van-europese-cloud>
- 23 'One characteristic of science in the Netherlands is that its cross-the-board quality is extremely high. In comparison with other OECD countries the Netherlands achieves a very high score in all scientific sectors and at its Applied Research Institutions [Toegepast Onderzoek Organisaties] (TO2s) and is a world leader (measured in terms of the quantity and quality of citations)'. Broad social review of the 'Innovative society', p. 33.
- 24 This is despite funding for applied research actually being cut during the period 2010 – 2017. See the report entitled Broad social review of the 'Innovative society', 20 April 2020, p. 28: 'Among others, the subsidies from the Economic Structure Enhancement Fund [Fonds Economische Structuurversterking] (FES) and subsidies aimed at promoting public-private R&D cooperation in specific fields (key areas) were also ended and state funding to applied research institutions (TO2-instituten) was also cut. This change in direction was accompanied by a drop in direct expenditure by the state on application-oriented R&D of approximately 450 mln. euros between 2010 and 2017. This was offset by increases in state funding for fundamental research and fiscal R&D incentives for companies.'
- 25 The Hague Centre for Strategic Studies (2019-08). 'Macro Implications of Micro Transformations; An Assessment of AI's Impact on Contemporary Geopolitics': <https://hcss.nl/report/macro-implications-micro-transformations-assessment-ais-impact-contemporary-geopolitics>. 'The European Union possesses a relatively competitive (more so than the Russian Federation, less so than the US and China) AI ecosystem, the likely geopolitical impact of which can generally be conceptualized as being hamstrung by fragmentation between Member States. The European union performs well within theoretical and advanced research, but generally fails to apply this research in practice. This is partially due to the bloc's general lack of large tech firms, meaning its exceptionally productive universities are essentially educating individuals to work for American enterprises. This is also partially the case due to a lack of EU and/or Member State sponsored initiatives to incentivize the private sector to engage in such activities.'
- 26 Broad social review of the 'Innovative society', p. 8: 'The Netherlands is fairly poor at converting research and innovation into economic and social impact (valorisation). This is evidenced by the low scores for 'research institutions prominence' and 'commercialization' in the 'Global Competitiveness Index' and for 'knowledge impact' in the Global Innovation Index and the relatively low proportion of Dutch research and development investments in 'development'.
- 27 According to MKB-Nederland, 86% of the branches in the Netherlands have indicated that there are problems with suppliers in the production chain: <https://www.mkb.nl/news-europa/impact-van-corona-op-productie-europese-landen>

- 28 <https://economie.rabobank.com/publicaties/2020/april/coronacrisis-vraagt-om-een-nieuwe-inrichting-van-de-nederlandse-samenleving/>
- 29 <https://www.flexnieuws.nl/nieuws/bedrijven-halen-productie-terug-naar-nederland/>
- 30 <https://www.awti.nl/documenten/adviezen/2020/01/30/persbericht-dringend-aandacht-nodig-voor-sleuteltechnologieen> 'The Netherlands has a good knowledge position in this field, but other countries have been investing more in this for longer and more specifically,' explains Uri Rosenthal, chair of the AWTI. 'What is needed is to invest more and more specifically in the development of key technologies. If we leave the development and application of these technologies to other countries, we will become dependent on choices made elsewhere'.
- 31 <https://www.rathenau.nl/nl/overheid-vergroot-investeringen-rd>
- 32 <https://www.rathenau.nl/nl/wetenschap-cijfers/geld/wat-geeft-nederland-uit-aan-rd/twee-en-een-half-procent>
- 33 'Investing persistently', AWTI and Germany Institute, November 2012.
- 34 <https://www.research-in-germany.org/en/research-landscape/r-and-d-policy-framework/pact-for-research-and-innovation.html>
- 35 This implies that growth in GDP is the ultimate goal, but that this growth must not be at the expense of prosperity, but actually contribute to it. This is the ultimate way of generating being able to generate growth or prosperity in future. In the growth letter to parliament of 13 December 2019 the government describes a step that can be taken to achieve a long-term growth strategy for the Netherlands. The motivation for the growth letter to parliament is the realisation that our prosperity must continue to be developed in order for us to remain stable, safe and wealthy country. In this context the growth letter to parliament states that: 'The government therefore believes that a substantially higher increase in our national income must be achieved as a matter of urgency, not as a goal in itself, but because we need that to fund the things we really consider to be important. [The Netherlands is facing] huge challenges such as climate change, the energy transition, the restoration of our countryside and a transition to a circular economy. We also want, for example, to maintain our public goods. [...] We would also like citizens' disposable income to increase, preferably for all groups. Increasing prosperity has to do with realising all these wishes.'
- 36 (Brynjolfsson and McAfee, 2014) assert that 'key technologies (are) the basis of ground-breaking innovations in almost all sectors. The letter to parliament in relation to the Growth Fund adds the following on that basis: 'As a small country, the Netherlands is one of those leading the way scientifically with regard to many key technologies but, without a focus on [...], it will not be able to create sufficient mass in the further development, diffusion and scaling up phases to be and remain competitive compared to other countries. [...] For that reason, choices will have to be made. [...] Key technologies are crucial for the earning capacity and for resolving social challenges, now and in the future.' The growth letter states that the Netherlands has an opportunity in this respect: 'An international comparative study [...] has shown that the Netherlands makes little funding available for direct investments in key technologies. Investing in clean technologies has knock-on effects for the economy as a whole and contributes to existing and new ecosystems.'
- 37 Including this investment in the national budget has the additional benefit of execution via existing procedures and organisations (Dutch Research Council [De Nederlandse Organisatie voor Wetenschappelijk Onderzoek] (NWO), Netherlands Enterprise Agency [Rijksdienst voor Ondernemend Nederland] (RVO), Applied Research Institutions [Toegepast Onderzoek Organisaties] (TO2s)).

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