

*Press release*

## Port of Rotterdam catches up in innovation

Rotterdam, 12 April 2019

**Rotterdam, 12 April 2019** --- in the field of innovation, the businesses in the port of Rotterdam have successfully caught up with companies elsewhere in the Netherlands. This is just one of the results of the new edition of the Port Innovation Barometer, a large-scale, multiannual study into innovation and the innovation climate in the Rotterdam port region, which was conducted on behalf of SmartPort and the Port of Rotterdam Authority by the Erasmus Centre for Business Innovation. Among other things, the same research reveals that on average, the group of innovation pioneers performs better than non-innovative companies, that the customer plays a dominant role in the innovation ecosystem, and that a considerable proportion of companies favours a more active role for the Port Authority in relation to digitisation, energy transition and the labour market in the port. The findings are based on an extensive survey among managers of 4,500 establishments in the port and the urban area surrounding the port.

*Elisabeth van Opstall (Managing Director of SmartPort) says, 'This research once again shows that companies that respond innovatively to the changes that are coming their way are better equipped to serve their existing and new customers. SmartPort is working with companies in the port to obtain decision information based on scientific research. This involves the creation of knowledge about and the impact of long-term developments such as the energy transition, climate, digitisation and automation. In the Port Innovation Barometer, the innovation pioneers underline the added value of alliances such as SmartPort.'*

The main findings of the investigation are as follows:

### **1. Port businesses are catching up in innovation compared to the national average**

An important barometer of innovation is the extent of incremental innovation (such as modifications of existing products or services and efficiency gains in operational processes or services) and radical innovation (such as putting new products or services on the market and exploiting new opportunities in new markets). In both areas, port businesses score higher than in the ECBI baseline measurement of two years ago, while at national level the scores have actually decreased. As a result, the previous 'gap' between the scores for the Rotterdam port area and the scores for the whole country has closed. Although this still does not make the port an innovation hotspot, it does show a clear improvement.

### **2. Considerable strategic impact of digitisation, energy transition and autonomous/semi-autonomous transport anticipated**

A substantial proportion of the port businesses expects that digitisation-related developments (the Internet of Things, blockchain and artificial intelligence) will have a significant strategic impact on business operations and strategy over the next five years. This also applies to developments in autonomous and semi-autonomous transport and - as far as companies in the industry cluster are concerned (chemicals, refining and energy) - to

the electrification of industrial processes, the use of bio-raw materials and, to a lesser extent, to 3D printing. The majority of companies say that technological developments have made many new product ideas or new types of services possible in their market, or present great opportunities for their sector.

### **3. Innovation vanguard shows profit**

In the survey, the business performance of the top 25% of innovative companies (the 'innovators') was compared with that of the bottom 25% (the 'laggards'). In order to determine innovation capacity, the study examined a wide range of innovation indicators, such as the extent to which new products, services, operational processes and business concepts were introduced. On average, the innovators score 29% higher in terms of attracting new customers and experience an average of 23% more market share growth. In terms of profitability, turnover and profit growth, the difference between the innovators and the laggards is more than 10%.

### **4. Innovation capacity largely determined by non-technological factors**

Compared to the group of innovation laggards, the group of innovators spends on average significantly more on R&D and ICT/supporting ICT. In addition, the innovative vanguard scores higher on average on various non-technological factors, including the level of entrepreneurial orientation, the introduction of new management practices (e.g. changes in the management method), the introduction of innovative HR practices (e.g. with regard to the autonomy and development of employees) and the extent to which the companies collaborate with external parties. The research shows that these and other non-technological factors contribute on average twice as much to the overall innovation capacity of companies as investment in R&D and ICT. According to Henk Volberda, one of the researchers, this outcome underlines 'the importance of the commitment to innovation in both the technological and the social and organisational domain.'

### **5. Customer determines innovation activities**

The customer plays a dominant role in the innovation ecosystem of companies; for almost 90% of the companies, it is true that customers (including business customers) are important to very important for their innovation activities. The top five main parties in the innovation ecosystem of port businesses is also made up of suppliers (of raw materials, materials, equipment or software), competing companies, complementary companies and the Port of Rotterdam Authority. Knowledge institutions and platforms, industry associations, government agencies, etc, are considered to be less important. At the bottom are start-up hubs, business incubators and accelerators, commercial laboratories and external prototyping and testing facilities; less than 15% of the companies consider these parties to be important for their innovation activities. This percentage is clearly higher among innovation pioneers.

### **6. Maritime suppliers most innovative**

The maritime and offshore manufacturing and wet hydraulic engineering industries form the most innovative cluster in the Rotterdam port region, and especially maritime suppliers. Other innovative sectors include non-maritime business, financial and IT services and third-party (3PL) logistics services.

### **7. Narrow majority has intention to innovate laid down in their business strategy**

The strategic agenda of about 55% of the companies explicitly states their intention to innovate. This percentage is almost the same as 10 years ago, when the same question was put to the port businesses. One in three companies has an independent department or unit set up for innovation purposes, and 45% have appointed one or more employees specifically to coordinate their innovation activities. The main innovation objective is to improve the quality of current products or services.

### **8. Majority of port businesses have difficulty attracting suitable personnel**

Approximately two-thirds of establishments in the port of Rotterdam and the urban area surrounding the port have difficulty in finding and attracting suitable employees on the labour market. According to Rick Hollen, who conducted the study together with Henk Volberda, this outcome confirms the image of a tightening labour market as outlined in previous media reports. Another bottleneck for a considerable section of port businesses lies in the current legislation and regulations, which 35% of the companies experience as an obstacle to the development of new products or services. The latter is particularly true for companies in the industry cluster (refining, chemicals, energy and utilities) (57%), the storage and transshipment sector (48%) and the transport and services for transport sector (44%).

### **9. Port businesses largely in favour of a more active role for Port Authority**

Many companies in the port area are of the opinion that the Port of Rotterdam Authority should play a more active role in making the area more sustainable by encouraging and facilitating CO<sub>2</sub> reductions (55% agree, 20% disagree, 25% neither agree nor disagree) and in digitising the area by facilitating and directing various data flows (53% agree, 23% disagree). In addition, a large number of companies want a more active role for the Port Authority in coordinating advice or support regarding a future-proof labour market (57% agree, 17% disagree), promoting cooperative relations between companies (62% agree, 13% disagree) and strengthening the international competitiveness of the port area (75% agree, 8% disagree).

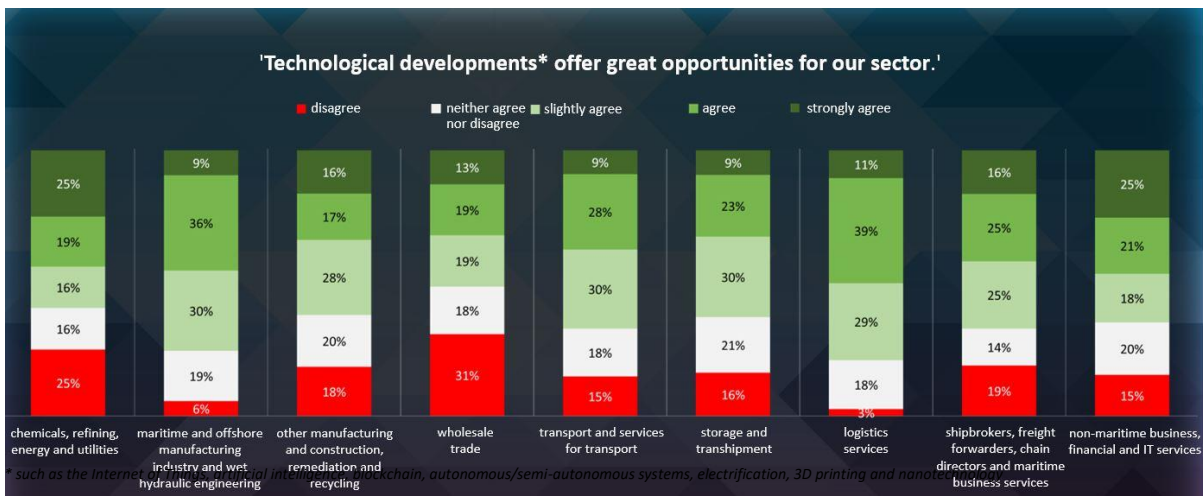
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**Over the past three years, a quarter of the average port company's turnover has come from new products or services, almost 20% from substantially improved products or services, and the remainder (almost 60%) from unaltered or marginally modified products or services**

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### Featured: Impact of technological developments

The results of the study in terms of the expected impact of technological developments underline the importance of innovation. For example, the vast majority of companies in the port expect that the 'Internet of Things' (IoT) - in which physical objects are connected to computer networks and share data - will become more important to much more important to business operations and strategy over the next five years. A smaller, but still substantial number of companies expect the same from artificial intelligence and blockchain technology. In particular, companies in the logistics sector expect blockchain to have a strategic impact. Another technological development that is expected to have a significant impact is autonomous/semi-autonomous transport. This applies in particular to companies in the maritime and offshore manufacturing industry and wet hydraulic engineering, transport and logistics. On the other hand, companies in the industry cluster (refining, chemicals, energy and utilities) largely expect strategic impact from the raw materials transition (i.e. an increase in bio-raw materials or green chemistry) and the electrification of industrial processes; in fact, 25% of the companies in this cluster expect that the raw materials transition and 18% expect that electrification will become a 'much more significant' part of the company's strategy in the coming 5 years. According to the study, the strategic impact of 3D printing technology is still limited. Rick Hollen, one of the researchers in charge of the study, had this to say about it: 'Just like two years ago, 3D printing is seen by companies in the port region as less of an innovation engine than one might expect, given the high media interest in this technology.'

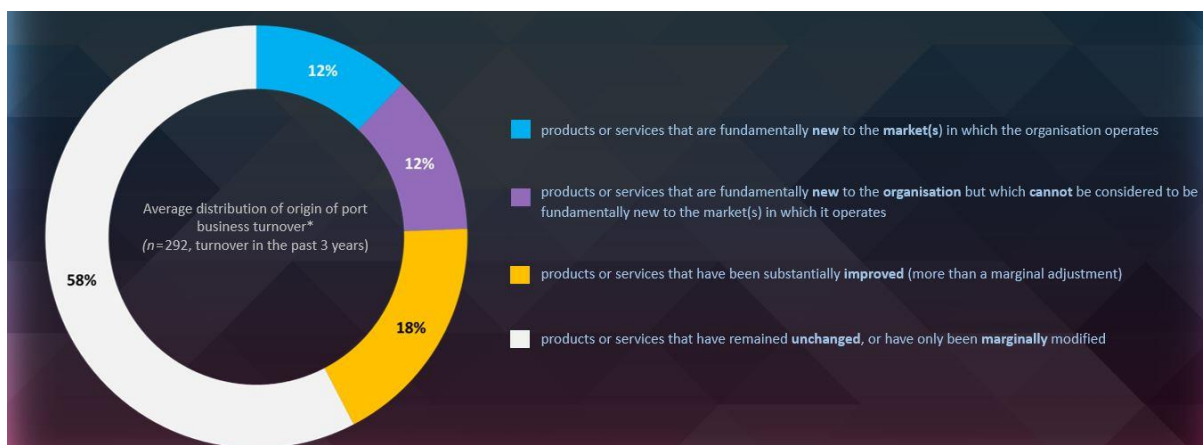


Two thirds of the respondents say that technological developments such as those mentioned above offer significant opportunities to their sector. However, there are clearly sectoral differences (see the figure above). More than half of the respondents suggest that technological breakthroughs have facilitated many new ideas for products or new types of services in the market(s) in which their company operates. For almost 20% of port businesses, changes in their environment strongly threaten the survival of the organisation; this is most applicable to companies in the storage and transhipment sector (applicable to 31% of the companies), the industry cluster (25%) and the maritime & offshore manufacturing industry and wet hydraulic engineering (23%).

### Featured: Innovation in the port area

Innovation is a broad concept and can therefore be measured in various ways. A key barometer of innovation is the extent of incremental innovation (e.g. modifications of existing products or services and efficiency gains in manufacturing processes or services) and radical innovation (e.g. exploiting new opportunities in new markets and putting new products or services on the market). In terms of incremental innovation, the port businesses score significantly higher (+5%) compared to the baseline measurement in 2016, whereas at a national level the score decreased by almost 2%. The score for radical innovation is 2.4% higher than in 2016, whereas at the national level there has been a decrease of almost 3%. Henk Volberda has this to say about it: 'The percentage shifts over two years may not be particularly large, but they are such that there is no longer a clear difference in innovation capacity between the port area and the national average, as we found two years ago with the aid of these indicators.'

In addition to incremental and radical innovation, the 2018 edition of the Port Innovation Barometer examined other innovation indicators, including product and process innovation. As far as product innovation is concerned, the study shows that about 30% of the companies in the port invest heavily in initiatives aimed at the development of new products or services. Nearly 45% of companies say they have introduced many new products or services in the past three years. The percentages are not the same for each sector; for example, the number of companies that have introduced a lot of new products or services in the maritime and offshore manufacturing and wet hydraulic engineering industries (62%) is twice as high as in the transport and services for transport sector (31%). Companies with at least 50 FTE employees generally score higher in terms of product innovation than smaller companies do (excluding start-ups). Over the past three years, a quarter of the average port company's turnover has come from new products or services, almost a fifth from substantially improved products or services, and the remainder (almost 60%) from unaltered or marginally modified products or services. On average, the companies in the maritime and offshore manufacturing and wet hydraulic engineering cluster have the highest share of turnover from new products and services. More of the turnover of companies in the industry cluster (refining, chemicals, energy and utilities) comes from unchanged or marginally modified products (72%) when compared to the other sectors.



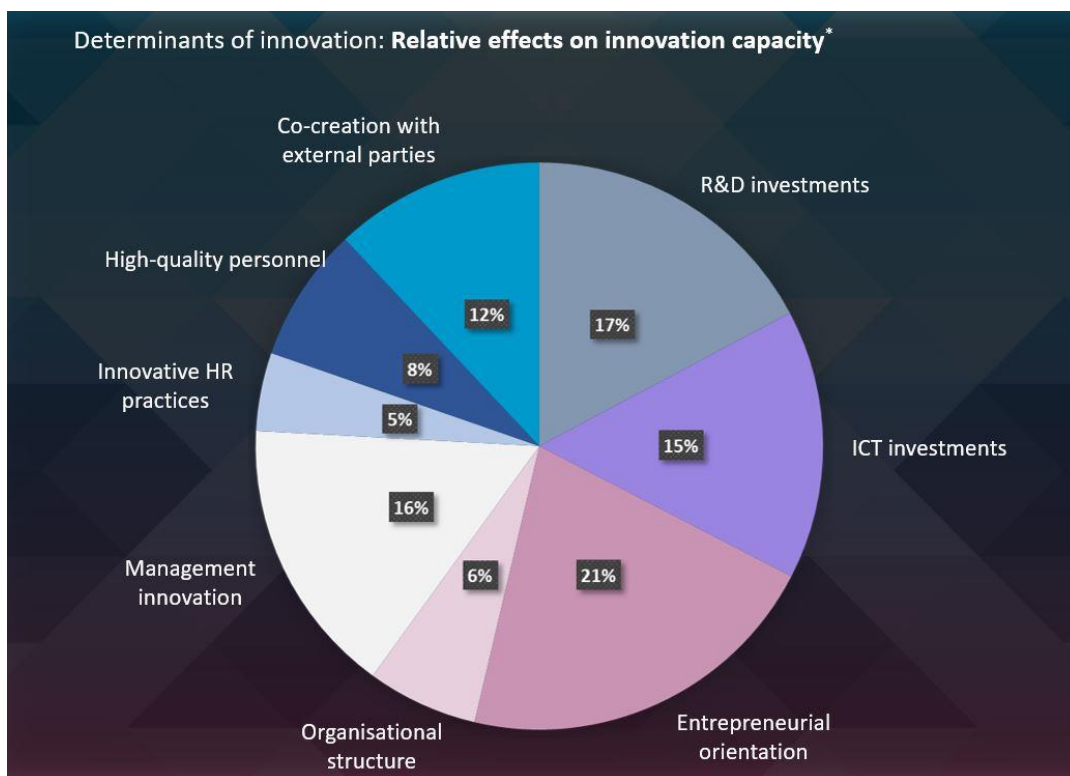
On average, companies in the Rotterdam port region score higher on process innovation than on product innovation. In recent years, about half of port businesses have regularly introduced new or vastly improved operational methods. More than a third of the companies say they quite regularly introduce new or significantly improved logistics processes or distribution methods. Among logistics service providers (3PL), this percentage is much higher (60%) than among companies in the transport (by road or water) and services for transport sector (36%).

Compared to other sectors, companies in the industry cluster have made the most significant changes in their competitive strategy over the past three years. In the area of 'marketing innovation' (the use of new sales channels and the introduction of new pricing methods and promotional techniques), logistics service companies are the most active, followed by companies in the business, financial and IT services, wholesale, and maritime & offshore manufacturing industry. Based on a wide range of innovation indicators (including the indicators mentioned above and also, for example, the extent to which the introduction of new business concepts is leading the way, the extent to which innovative HR practices have been introduced and the extent to which activities are developed, redefining the sector in which a company operates), the maritime and offshore manufacturing industry and wet hydraulic engineering cluster have been identified as the most innovative, and within this cluster, especially the maritime suppliers. Other relatively innovative sectors include third-party (3PL) logistics services, and non-maritime business, financial and IT services. The researchers call it 'striking' that the average innovation capacity of non-maritime business, financial and IT service providers is significantly higher than that of maritime-related service providers (shipbrokers, freight forwarders, chain directors and maritime-business service providers).



### Featured: Business performance and success factors of innovation leaders

In the study, the business performances of the top 25% innovative companies (the ‘innovators’) was compared with that of the bottom 25% (the ‘laggards’). The group of innovators scores on average 29% higher on attracting new customers and experiences on average 23% more market share growth. In terms of revenue & profit growth and profitability, the difference between the two groups of companies is over 10%. Henk Volberda: ‘These results seem to suggest that innovation pays off’.



\* Relative effects (100% = sum of mentioned effects) using standardised regression coefficients

Compared to the ‘laggards’, the ‘innovators’ in the port area spend significantly more on research and development (R&D), ICT infrastructure and supporting or other software. Volberda classifies R&D and ICT investments as ‘technological determinants of innovation’ to clarify that ‘the innovative capacity of enterprises, in terms of, for example, product and process innovation, depends to an even greater extent on *non*-technological factors’. Examples of such factors are the extent of entrepreneurial orientation, the introduction of new management practices (such as changes in the method of management), the degree to which high-quality employees are employed, the introduction of innovative HR practices (with regard to, for example, the autonomy and professional development of employees), the organisational structure with regard to absorbing, sharing and safeguarding new knowledge, and the extent to which various forms of collaboration take place with external parties such as customers, suppliers and knowledge institutions (co-creation). The Port Innovation Barometer 2018 shows that on average, the ‘innovators’ score higher on each of these factors than the ‘laggards’. The study also shows that, on average, these factors contribute twice as much to innovation capacity as investments in R&D and ICT. According to Volberda, this outcome is not surprising: ‘Several previous studies over the past decade have shown that innovation in the non-technological domain - what we call social

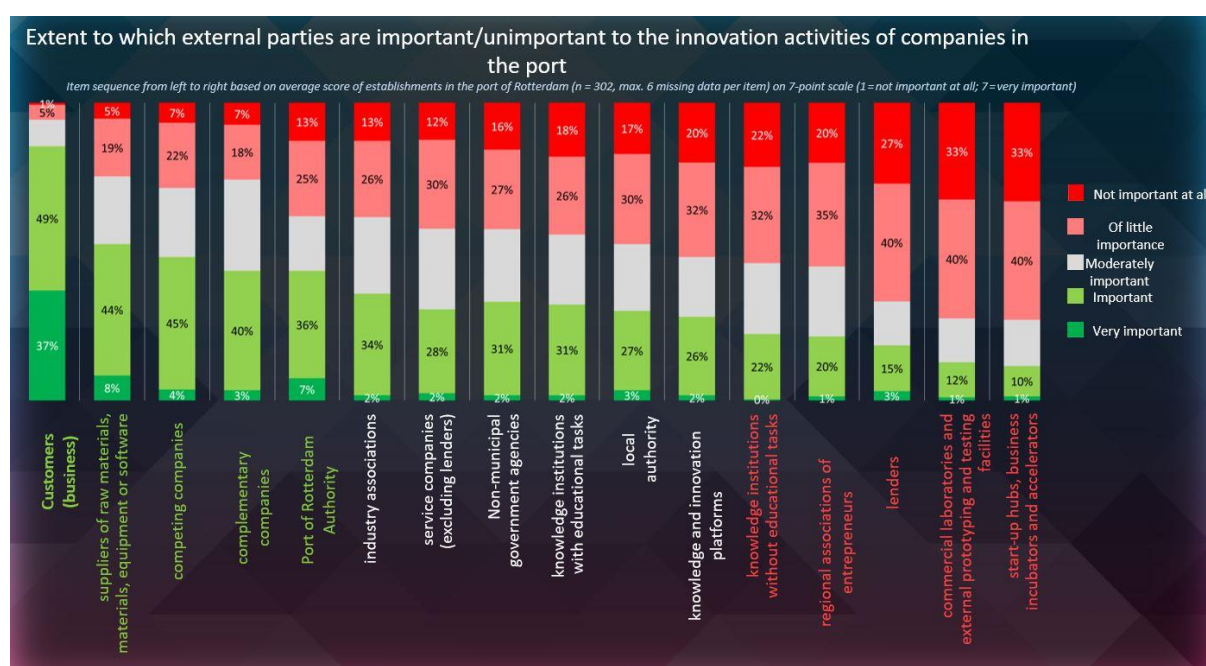


innovation - accounts for at least two-thirds of the ultimate innovation success of companies.’ He therefore advises companies with an ambitious innovation agenda to ‘look beyond simply investing in R&D.’

Of the technological and non-technological determinants of innovation mentioned, the degree of entrepreneurial orientation has the greatest relative effect on innovation, followed by R&D investments, the introduction of new management practices, ICT-related investments, and co-creation with external parties (see also the figure above).

### Featured: Innovation ecosystem

One of the focus areas in the Port Innovation Barometer survey is the innovation ecosystem, i.e. the network of entities that play a role in the innovation activities and performance of companies in the port area. One third of companies questioned said that the origin of new products, services, processes or activities usually lies in collaborative relationships with external parties. In order to gain a better understanding of the innovation ecosystem of the port businesses, respondents were asked to what extent various external parties are important to their organisation’s innovation activities; see the figure below. The results indicate a dominant role for customers (including business customers). For 86% of the companies, the customer plays an important (49%) to very important (37%) role. The top five most important external parties in the innovation ecosystem of port businesses is also made up of suppliers (of raw materials, materials, equipment or software), competing companies, complementary companies and the Port of Rotterdam Authority. Suppliers are rated as important (44%) to very important (8%) by a narrow majority of companies. With regard to the Port Authority, these percentages are 36% and 7% respectively. The difference between the interests of customers and those of the remaining top five is therefore considerable. ‘It is clear that innovation activities of companies in the port are largely client-driven,’ says Rick Hollen. According to the researchers, the results suggest the importance of an innovation-ecosystem policy in which attention is paid to innovation-oriented collaboration within the chains of companies and their customers and suppliers. Henk Volberda: ‘If a company’s most important customers are conservative, a company will be less inclined to innovate.’





Included outside the top five external parties that are important for the innovation activities of companies, we find knowledge institutions (with *or* without educational tasks), knowledge platforms, sector associations, the local authority and other government agencies. At the very bottom of the list are start-up hubs, business incubators and accelerators, and just above them are commercial laboratories and external prototyping and testing facilities; less than 15% of the respondents consider these parties to be important for their innovation activities. Rick Hollen: 'This outcome is striking, because as part of the strengthening and presentation of the innovation ecosystem in the region by the Port Authority, the local authority and other parties, in recent years a great deal of attention has been paid to start-up hubs, incubators, accelerators and external test facilities, the number of which has now grown considerably. This approach route to accelerate innovation in the area is to a significant extent aimed at catalysing and facilitating start-ups and connecting them with the established business community. However, the percentage of companies in the port that have actually entered into one or more collaborative relationships with start-ups over the past three years is still limited to around 15 percent. This is certainly an area that needs looking at if the success of the approach route is to be increased. This percentage is considerably higher among the group of innovation pioneers, which is to say 30%. In addition, innovation pioneers on average attach considerably more importance to things such as knowledge and innovation platforms (such as SmartPort and iTanks), start-up hubs, business incubators and accelerators.'

With around one third of the companies, their head offices or branches outside the port play a key role in the renewal of products, services, processes and/or activities. There is a certain 'head office effect': on average, port businesses with a Dutch head office score significantly higher on product innovation and radical innovation than companies with a head office abroad. In addition, the share of sales of fundamentally new products and services at these companies is on average higher than at companies with a foreign head office. Henk Volberda: 'To a certain extent, many of the port's business locations depend on foreign head offices for their innovation-related activities, which does not always benefit their innovation performance.'

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**Port area businesses with a Dutch head office score significantly higher in terms of product innovation and radical innovation than businesses with a head office abroad**

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#### **About the study**

The *Port Innovation Barometer* is a large-scale, multiannual study by the Erasmus Centre for Business Innovation (Erasmus University Rotterdam) aimed at identifying and monitoring renewal and the innovation climate in and around the Rotterdam port area. The study is being conducted by Prof Henk Volberda and Dr Rick Hollen under the flag of SmartPort. The study is based on an extensive survey (+150 questions) among directors and other managers of approximately 4,500 business establishments in the Rijnmond-Drechtsteden region and surrounding area, including over 900 establishments in the port of Rotterdam. The survey questions relate to innovation in the broad sense, varying from product and process innovation to various forms of non-technological innovation (including social innovation). The study also examines open innovation and the innovation ecosystem of companies, market and technology-related developments, organisational characteristics and performance. More than 600 managers took part in the 2018 edition, with more than half of them responsible for one or more establishments in the port of Rotterdam. These 'port respondents' represent almost 40% of all establishments in the port with at least 3 FTE employees. Branches with fewer FTE employees were not included in the study. For comparison purposes, some of the questions were also included in a national survey conducted by the Erasmus Centre for Business Innovation.

Based on the Port Innovation Barometer study results and a related study (also financed by SmartPort) conducted by the Erasmus Centre for Business Innovation in association with the Erasmus Centre for Urban, Port & Transport (Erasmus UPT), a report on renewal and the innovation climate in the port of Rotterdam is expected to be published in mid-2019.

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