



EUROPE

Relationships between the economy and national security

Analysis and considerations for economic
security policy in the Netherlands

Lucia Retter, Erik Frinking, Stijn Hoorens, Alice Lynch,
Fook Nederveen and William Phillips



For more information on this publication, visit www.rand.org/t/RR4287

Published by the RAND Corporation, Santa Monica, Calif., and Cambridge, UK

RAND® is a registered trademark.

© 2020 Wetenschappelijk Onderzoek- en Documentatiecentrum

Cover image shared by the Frans Berkelaar via Flickr Creative Commons;
no known copyright restrictions.

RAND Europe is a not-for-profit research organisation that helps to improve policy and decision making through research and analysis. RAND's publications do not necessarily reflect the opinions of its research clients and sponsors.

All rights reserved. No part of this book may be reproduced in any form by any electronic or mechanical means (including photocopying, recording, or information storage and retrieval) without permission in writing from the sponsor.

Support RAND

Make a tax-deductible charitable contribution at
www.rand.org/giving/contribute

www.rand.org

www.randeurope.org

Preface

The Research and Documentation Centre (WODC) in the Netherlands commissioned RAND Europe to explore the relationship between the economy and national security. The study conceptually investigated the connections between the economy and national security, before applying the ensuing perspectives to the characteristics and performance of both the Dutch economy and its national security.

This report summarises the findings from the study, and draws on a review of academic literature and national policy documentation, as well as information solicited through expert interviews. In doing so, we present a historical perspective of scholarly thinking about national security and the interconnectedness between the economy and security. The framework and supporting analysis contained within this report present a structured method for understanding the strategic-level relationships between the economy and national security.

As part of this study we propose a conceptual framework for examining economy-related factors that could have a disruptive effect on society due to their impact on national security. This approach is consistent with the increased scholarly focus on human-centric security, as well as the way in which national security is operationalised in many modern states. As part of this framework we propose a concept of ‘risk vectors’ – avenues through which national security risks to critical infrastructure, sectors and processes can be manifested. Finally, we explore the proposed framework from an empirical perspective and apply it to the Netherlands, using an illustrative example of three risk vectors.

This report may be of interest to policymakers and professionals who are responsible for national security, and to researchers with an interest in economic security. The report is prepared for the National Coordinator of Counterterrorism and Security in the Netherlands.

RAND Europe is an independent not-for-profit research institute, whose mission is to help improve public policy- and decision-making through objective research and analysis. Part of the RAND Corporation, RAND Europe has over 25 years of experience in conducting policy research. This report has been peer-reviewed in accordance with RAND’s quality assurance standards.

For more information about RAND Europe or this document, please contact Stijn Hoorens (hoorens@rand.org).

RAND Europe
Rue de la Loi 82, Bte 3
1040 Brussels, Belgium
Tel: +32 2669 2400

RAND Europe
Westbrook Centre, Milton Road
Cambridge CB4 1YG, United Kingdom
Tel: +44 1223 353329

Table of contents

| | |
|--|-----------|
| Preface | iii |
| Table of contents..... | v |
| Figures | vii |
| Tables | viii |
| Boxes | ix |
| Summary | xi |
| Samenvatting | xvii |
| Acknowledgements..... | xxv |
| 1. Introduction and context..... | 1 |
| 1.1. Thinking about economic security in the Netherlands | 1 |
| 1.2. An approach to understand the links between macroeconomic variables and national security 2 | |
| 1.3. Research questions and research steps | 5 |
| 1.4. Structure of this report..... | 7 |
| 2. A historical perspective on definitions of national security..... | 9 |
| 2.1. Scholarly thinking about national security until the 19 th century..... | 9 |
| 2.2. Understanding of interconnectedness between security and the economy in the 20 th century 10 | |
| 2.3. A shift towards a more ‘human-centric’ focus..... | 16 |
| 2.4. Different perceptions of national security result in differences in national risk assessment processes | 22 |
| 2.5. A ‘broader’ definition of national security to include the economic dimension..... | 23 |
| 2.6. A trend towards considering economic and welfare aspects in national strategic documents .. | 25 |
| 2.7. Critical infrastructures, sectors and processes that enable the functioning of society | 29 |
| 2.8. Summary | 30 |
| 3. Interconnections between national security and the economy | 31 |
| 3.1. Conceptualising national security through the lens of critical infrastructure, sectors and processes | 31 |
| 3.2. A conceptual framework linking economic factors with potential threats to national security 35 | |
| 3.3. A closer look at risk vectors | 39 |

| | | |
|-----------|---|------------|
| 3.4. | A closer look at global and regional trends | 56 |
| 3.5. | Summary | 66 |
| 4. | The connections between economy and national security in the Netherlands..... | 69 |
| 4.1. | Unique characteristics of the Dutch economy and related economic risks | 69 |
| 4.2. | Risks associated with foreign ownership in the Netherlands | 73 |
| 4.3. | Skills gaps in technical professions and the increased risks for critical processes | 79 |
| 4.4. | National security risks associated with natural resources and food security | 84 |
| 4.5. | Summary | 90 |
| 5. | Conclusion..... | 93 |
| 5.1. | RQ1: How can national security be defined and what does the international literature suggest about its main components?..... | 93 |
| 5.2. | RQ2: What can be learned from the literature about the relationship(s) between the economy of a country and the various aspects of national security? Which factors, mechanisms and underlying causal mechanisms can be identified? | 94 |
| 5.3. | RQ3: What is the impact of contextual, country-specific characteristics and factors on this relationship?..... | 96 |
| 5.4. | RQ4: What do the answers to research questions 2) and 3) tell us about the factors and characteristics that have an impact on the interconnections between the Dutch economy and its national security?..... | 96 |
| 5.5. | RQ5: How does the Netherlands perform with regard to these economic factors, which trends or developments can we identify, and what do they mean for the national security of the Netherlands?..... | 97 |
| | References | 99 |
| | Annex A. List of interviewees | 129 |
| | Annex B. National security: country examples | 131 |
| | Annex C. The approach to national security in the Netherlands..... | 149 |

Figures

| | |
|--|------|
| Figure A.1. Proposed analytical framework of risk vectors through which the economy can affect critical infrastructure, sectors and processes..... | xiii |
| Afbeelding A.1. Voorgesteld analytisch raamwerk van de risico's waarmee de economie de kritieke infrastructuren, sectoren en processen kan beïnvloeden. | xix |
| Figure 1.1. Report structure | 8 |
| Figure 2.1. Mapping different countries' present-day understanding of national security on a two-dimensional scale..... | 28 |
| Figure 3.1. Proposed analytical framework of risk vectors through which the economy can affect critical infrastructure, sectors and processes..... | 36 |
| Figure 4.1. GDP contribution by different sectors in the Netherlands, 2017 | 70 |
| Figure 4.2. FDI net inflows as % of GDP in the Netherlands..... | 72 |
| Figure 4.3. STEM graduates, comparison between Netherlands and EU, 2013–2017 | 81 |
| Figure 4.4. Percentage of resource consumption from domestic extraction, 2014 | 85 |
| Figure 4.5. Origin of imports of raw materials, 2014..... | 85 |
| Figure 5.1. Proposed analytical map of risk vectors through which the economy can affect critical infrastructure, sectors and processes..... | 95 |

Tables

| | |
|--|-----|
| Table 1.1. Research questions..... | 6 |
| Table 2.1. Brief summary of countries' understanding of national security | 27 |
| Table 3.1. Overview of critical sectors and processes as defined in selected countries | 33 |
| Table 3.2. Critical processes in the Netherlands | 35 |
| Table 4.1. Trade indicators in critical sectors: Netherlands..... | 71 |
| Table 4.2. FDI Restrictiveness index: Netherlands compared with OECD average..... | 73 |
| Table 4.3. Questions for consideration when assessing potential security risks..... | 74 |
| Table 4.4. Expected change in employment in the Netherlands (2016–2030). Critical sectors highlighted in blue..... | 82 |
| Table A.0.1. List of interviewees..... | 129 |
| Table C.0.1. National security interests of the Netherlands | 150 |
| Table C.0.2. Risk categories in the National Risk Profile (NRP) | 151 |
| Table C.0.3. Assessment criteria for NRP scenarios..... | 152 |

Boxes

| | |
|---|----|
| Box 1. Definitions of critical sectors, infrastructure and processes..... | 4 |
| Box 2. Economic variables..... | 5 |
| Box 3. Macroeconomic variables | 37 |
| Box 4. Example of foreign-transactions review process expanded to cover physical proximity risk..... | 41 |
| Box 5. Example of risks of accessing sensitive information and data and their potential misuse by foreign investors..... | 42 |
| Box 6. Example of risk mitigation to prevent leaking of sensitive information and knowledge on the national defence industrial base | 43 |
| Box 7. Example of risks related to skills gaps in relation to energy generation and supply | 47 |
| Box 8. Example of risks related to technology gap | 48 |
| Box 9. Example of government economic policy – steel tariffs..... | 51 |
| Box 10. Example of government regulation of critical sector – energy | 53 |
| Box 11. Example of socio-economic equality within a national security framework: Russia | 56 |
| Box 12. Use of data by private companies to influence elections – Cambridge Analytica | 66 |
| Box 13. The attempted Mexican takeover of Dutch Telecom Company KPN..... | 77 |
| Box 14. Considerations regarding Huawei investment in 5G infrastructure in the Netherlands..... | 77 |
| Box 15. Example of risks posed by natural resource dependence..... | 86 |

Summary

In a context of globalisation and further economic integration in recent decades, the relationship between the economy and national security has become increasingly interlinked. For the Netherlands, these connections represent both opportunities and potential threats for the country's national security. The open and interconnected nature of the Dutch economy creates vulnerabilities from potential internal and external threats. In recognition of this, economic security has emerged as an important strategic priority for the Dutch government, with the connection between economic security and broader national security subject to particular emphasis in the most recent National Security Strategy (2019). 'Threats to vital economic processes' has been cited in the Integrated International Security Strategy 2018-2022 (IISS) as one of the six most urgent national security threats.

Given these growing international interdependencies within Dutch national security, as well as recent concerns raised by planned foreign investments into Dutch strategic sectors, there is a recognised need for assessments of the potential risks to national security that may emerge as a result of such economic activities. Given the importance of certain sectors to the effective functioning of the Dutch society, there is a need for a deeper conceptual understanding of the economy-related threats that may impact Dutch society.

Research questions and objectives

In this context, RAND Europe was commissioned by the Research and Documentation Centre (WODC) to examine the relationship between the economy and national security in the Netherlands, with a focus on the characteristics and performance of the Dutch economy and the consequences of this for its national security.

This report addresses five research questions:

1. How can national security be defined and what does the international literature suggest about its main components?
2. What can be learned from the (academic) literature about the relation between the economy of a country and the various aspects of national security? Which factors, mechanisms and underlying causal mechanisms can be identified?
3. What is the impact of contextual, country-specific characteristics and factors on this relationship?
4. What do the answers to research questions 2) and 3) tell us about the factors and characteristics that have an impact on the interconnections between the Dutch economy and its national security?
5. How does the Netherlands perform with regard to these economic factors, which trends or developments can we identify, and what do they mean for the national security of the Netherlands?

The analysis of this report is focused on those specific aspects of national security that relate to the protection of critical infrastructure, sectors and processes that are important for the sustainable functioning of [Dutch] society. Critical infrastructure, sectors and processes are focal areas when it comes to national security policy, in the Netherlands and beyond.

In order to conceptualise the relationship between macroeconomic variables and national security (as outlined above), the research team developed an analytical framework through which the relationship between various aspects of the economy and national security can be understood. This conceptual framework forms a core component of this study and underpins the analysis and structure of this report. The framework was then applied using an illustrative example of three risk vectors that have specific relevance to the Netherlands.

1. How can national security be defined and what does the international literature suggest about its main components?

The perspectives on security are numerous and diverse, but there is no consensus on a single definition. Understanding of national security has evolved over time, and it has been shaped and influenced by theoretical interpretations of international relations as well as historical events and trends. In broad terms, stability, safety, protection, and freedom from fear, threat and conflict are considered as some of the core themes that the policy and academic literature examines when defining national security. Also, security can be defined in terms of the values that people hold, for example physical safety, economic welfare, autonomy and psychological well-being.

Prior to the end of the Cold War, the traditional notion of security revolved around realist explanations of state actions and the nature of international conflict. Since the end of the Cold War, scholars have expanded the scope of security to better account for globalisation and wider trends following the end of the bipolar struggle for power. Many of these aspects focus less on the state and on conflict and more on human-centric threats and risks – expanding to include areas such as crime, health and environmental concerns and economic security. Hence, national security has become associated with preventing disruptive effects on society, economic performance or critical processes, such as democratic decision-making processes.

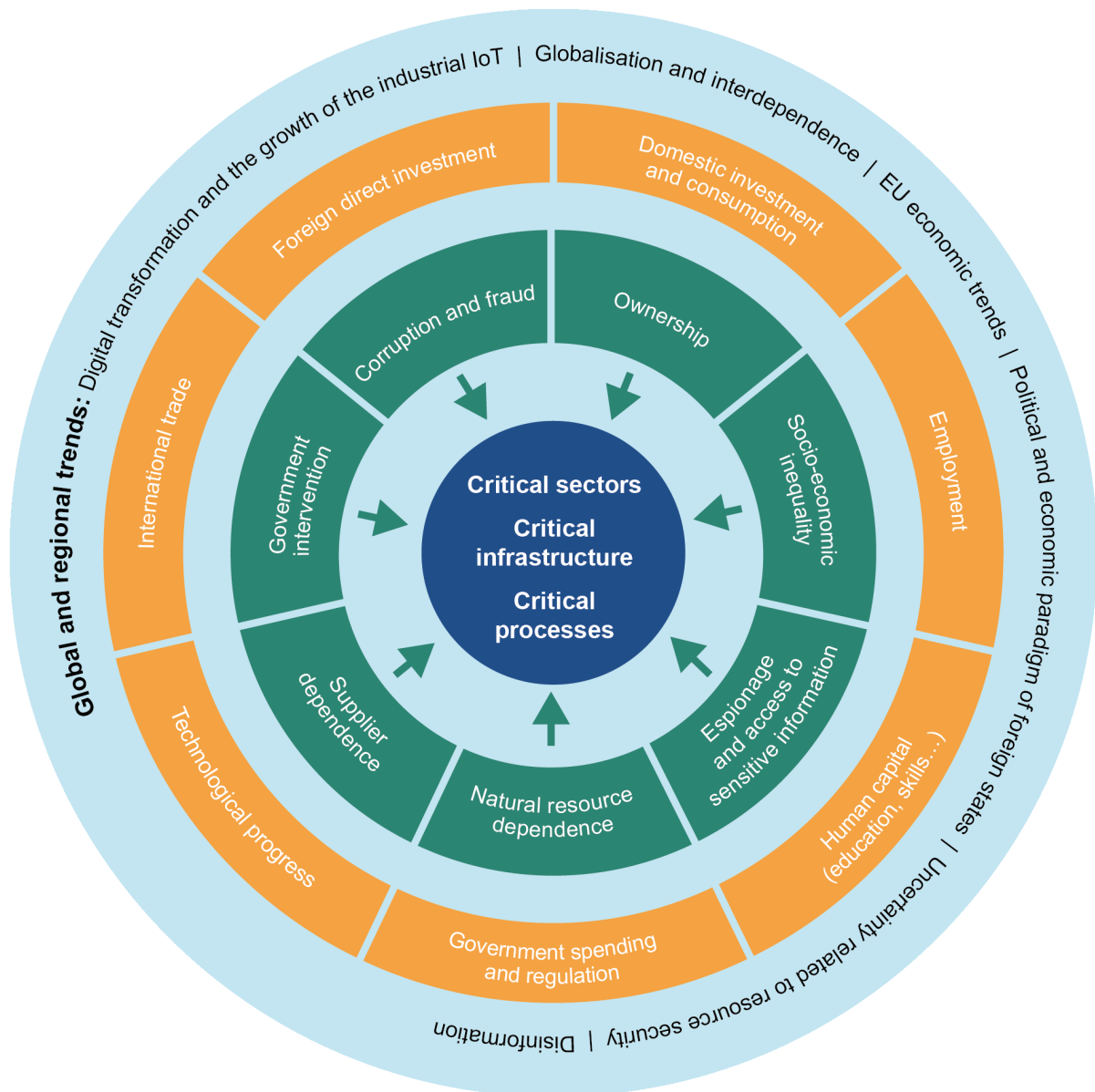
However, despite the broadening (and deepening) academic definition of national security, human-centric aspects are still underrepresented in governments' approaches to protecting national security, both in the Netherlands and other comparator countries. The critical processes identified in the national security strategies of the selected countries are mostly limited to physical production and distribution of specific goods and services.

2. What can be learned from the (academic) literature about the relation between the economy of a country and the various aspects of national security? Which factors, mechanisms and underlying causal mechanisms can be identified?

This study proposes a conceptual framework to represent the economy-related factors that could have a disruptive effect on society due to their disruptive impact on critical infrastructure, sectors and processes that are vital for the sustainable functioning of [Dutch] society. The framework schematically illustrates the manifestation of economic risks to national security as a series of concentric circles (see Figure A.1).

This approach is consistent with how thinking about national security is operationalised in many modern states. However, recognising the broadening concept of security in academic circles, the conceptual framework may also include more human-centric processes, such as human rights or democratic processes.

Figure A.1. Proposed analytical framework of risk vectors through which the economy can affect critical infrastructure, sectors and processes



Source: RAND Europe Analysis.

Based on the analysis of academic, policy and grey literature, we discuss a number of economically-related risks to critical infrastructure, sectors and processes that merit the consideration of policymakers. In order not to overcomplicate matters, the conceptual framework does not identify causal connections between individual factors, yet it demonstrates a variety of effects that the economy and national security have on each other. We have identified seven 'risk vectors' that represent the vehicles through which economic variables and events can impact critical infrastructure, sectors and processes in ways that could threaten national security. These vectors are:

- **Ownership** (through control and influence) by public or private actors of critical infrastructure and sectors, or ownership of assets in physical proximity to critical infrastructure and sectors.
- **Espionage and access to sensitive information** enabled, for example, by physical proximity or ownership.
- **Natural resource dependence** on third countries and actors for the supply of critical raw materials and energy.
- **Supplier dependence** on specific suppliers for the provision and maintenance of critical infrastructure and processes, reinforced by the presence of a skills and technology gap and lack of competition, which may result in reduced efforts to ensure resilience of critical infrastructure, sectors and processes as well as reduced innovation and R&D.
- **Government intervention** through expenditure, economic policy and regulation (or lack thereof), which can have a strong influence on the quality, availability and resilience of critical infrastructure, sectors and processes.
- **Corruption and fraud**, which may undermine the resilience of critical infrastructure and potentially create opportunities for malicious actors to obtain physical or digital access to sensitive assets and information.
- **Socio-economic inequality** resulting from factors such as economic policies and neoliberal market forces, which may reduce the ability of citizens to provide for themselves, as well as risk social unrest and domestic instability that pose a threat to critical infrastructure, sectors and processes.

In addition, the literature shows that a number of global economic and geostrategic trends could also present risk factors to critical infrastructure, sectors and processes, and therefore should be considered alongside an analysis of risk vectors linked to macroeconomic events and variables. These trends include:

- **Digital transformation and the implementation of industrial IoT** bringing challenges in relation to security of supply chain, cyber security and risks of data espionage in critical sectors and processes.
- **Globalisation and interdependence** between critical infrastructure, sectors and processes of one country with others, magnifying risks to an individual country's national critical infrastructures, which can be affected through cascading effects from developments elsewhere.
- **International economic trends** playing a critical role on countries due to increased interconnectedness via economic, business, political and governance structures, as well as the expanded influence of private actors over political processes.
- **The political and economic paradigm of foreign states** which, similar to protectionism, considers the risks related to different national economic models and their impact on the competitiveness in the area of critical sectors and processes.
- **Uncertainty in relation to resource security**, particularly in relation to reliance on foreign suppliers of energy and the uptake of alternative energy generation, distribution and storage technologies.
- **Potential concerns with regard to information integrity and trustworthiness**, which may act as an avenue for malicious actors including private companies to disrupt critical processes – such as elections and democratic decision-making – and gain influence in critical sectors (such as telecommunications or political institutions).

It is beyond the scope of this study to consider the detailed mechanics between the macroeconomic variables and events, the risk vectors and the critical infrastructure, sectors and processes. This study, instead, considers the strategic picture of macroeconomic variables and events and the avenues (risk vectors) through which they may impact critical infrastructure, sectors and processes as a sub-set of means by which a state can guarantee national security to its citizens.

3. What is the impact of contextual, country-specific characteristics and factors on this relationship?

The degree to which each risk may manifest itself in any given country, as well as the importance of each vector for any specific critical sector, will be largely determined by contextual and country-specific factors. These include, among other factors, the size of different critical sectors and the level of government expenditure in public sectors and their regulations. For example, countries with greater emphasis on deregulation and free market economies may be more comfortable with private-sector provision of some critical services and processes, whereas economies with a higher level of state intervention will be characterised by a higher degree of state influence over critical sectors and processes.

In addition, the extent to which a state may be exposed to individual risk vectors is shaped by the nature of the economy, the type of governance structure, the degree of economic openness (e.g. restrictions placed on trade, capital flows, migration), as well as other unique characteristics of the state in question. Countries that are closely integrated into transnational economic structures, such as the EU, may be more vulnerable to the impact of EU economic trends and developments. Where relevant, we highlight some of the country-specific differences and their implications in the ensuing analysis. However, a proper comparative analysis of risk exposure of different types of states to the risk vectors is beyond the scope of this study.

4. What does this teach us about the factors and characteristics that have an impact on the interconnections between the Dutch economy and its national security?

Applying this framework to the context of the Netherlands, and assessing the economic risks to its national security, would go beyond the scope of this study. However, an illustrative example of three risk vectors with specific relevance to the Netherlands was selected: foreign ownership; skills gaps in technical and related professions; and international dependence on natural resources and food security.

Foreign ownership. The Netherlands is a small country, but it is the world's 18th largest economy, and is deeply integrated within the EU. The high reliance on international trade is likely to expose a country to global and regional trends more acutely, due to the increased interconnectedness with other countries and regions through trade connections. In the Netherlands, such a degree of reliance on international trade is visible also within specific critical sectors. The level of restrictions on foreign direct investment (FDI) in the Netherlands is uniformly low, including in sectors contributing to vital processes. While this openness brings great opportunities for economic growth, technology transfer, information exchange and international collaboration, FDI can also present potential risks to national security as it may facilitate access and control of critical sectors and processes by foreign actors with malicious intent. Such concerns have been subject to considerable attention from the Dutch government and the general public, for example, as witnessed in the public discussions on the KPN acquisition case or the current Huawei 5G debate.

Skills gaps. In the Netherlands, and across Europe more widely, there is an identified need for increased digital literacy in order to combat the spread of online disinformation that can distort the outcome of critical processes. The Netherlands is also experiencing continued skills gaps in STEM and ICT skills, particularly in contrast to the EU averages in supply of these skills, which may present a national security risk for critical sectors in terms of their ability to recruit and retain talent to enable their successful functioning. While the Netherlands is a welcoming destination to a high proportion of international students in technical disciplines, if domestic talent is not grown and developed, the Netherlands may need to rely on foreign suppliers of critical processes.

International dependence on natural resources. Finally, there are some areas where the Netherlands is heavily reliant on imports of raw materials – for example crude oil, metals and rare earth minerals – and is thus more exposed to risks and uncertainty around resource supply. It is important to note, however, that there are also areas where the Netherlands is self-sufficient in resource extraction and can cover most, if not all, of domestic consumption from domestically extracted materials (e.g. much of biomass products such as potatoes, natural gas). Here, the national security risk linked to resource dependence is limited.

5. How does the Netherlands perform with regard to these economic factors, which trends or developments can we identify, and what do they mean for the national security of the Netherlands?

The Dutch economy is characterised by a number of distinguishing features that have implications for the ways in which each risk vector may manifest itself in the Netherlands. The Dutch economy is characterised by openness and the free flow of products, services and knowledge. As a result, security risks arising from economic activities in Dutch critical sectors primarily relate to areas where control and influence could be gained over a nation's public, strategic or 'critical' interests. The analytical framework presented in this report provides a means by which these risks may be understood.

In protecting these critical sectors, infrastructure and processes, a number of trade-offs can be recognized. For example, between economic and related benefits on the one hand versus measures designed to minimise security risks. Further complicating the challenges around these trade-offs is the fact that the complex interdependent nature of the links between economic and security spheres means that it is virtually impossible to draw up a workable *ex-ante* distinction between where an economic interest ends and a national security interest begins.

While the analytical framework presented in this report provides a mechanism for understanding the connections between the economy and national security in the Netherlands, it is important to note that the macroeconomic variables may be subject to change over time, and new variables may also emerge. Therefore, when applying the framework in the Dutch context, potential changes to the risk vectors should be taken into consideration, as well as the national circumstances in which they are applied.

Building upon the analytical framework presented here, further research to explore the risk vectors in greater detail would support a more comprehensive and granular understanding of the complex interactions between different elements of the economy and national security. Nevertheless, the framework and supporting analysis contained within this report present a structured method for understanding the strategic-level relationships between the economy and national security.

In de context van de globalisering en de toegenomen economische integratie van de afgelopen decennia zijn de economie en de nationale veiligheid steeds verder met elkaar verweven geraakt. Voor Nederland biedt deze verwevenheid kansen maar levert ook potentiële bedreigingen voor de nationale veiligheid op. Het open karakter en internationale afhankelijkheid van de Nederlandse economie maakt dat ze kwetsbaar is voor potentiële interne en externe bedreigingen. De Nederlandse overheid erkent dit en heeft daarom van economische veiligheid een belangrijke strategische prioriteit gemaakt. In haar Nationale Veiligheidsstrategie in 2019 heeft ze de relatie tussen economische veiligheid en de veelomvattendere nationale veiligheid specifiek benadrukt. Bedreigingen die in staat zijn essentiële economische processen te treffen worden in de Geïntegreerde Buitenland- en Veiligheidsstrategie 2018-2022 (GBVS) één van de zes urgente bedreigingen voor de nationale veiligheid genoemd.

Vanwege deze groeiende internationale onderlinge afhankelijkheden binnen de Nederlandse nationale veiligheid en gezien de recente zorgen over geplande buitenlandse investeringen in sectoren die voor Nederland van strategisch belang zijn, wordt algemeen erkend dat het noodzakelijk is om de potentiële risico's van zulke economische activiteiten in te schatten. Omdat bepaalde sectoren belangrijk zijn voor het effectief functioneren van de Nederlands samenleving is er behoefte aan een beter conceptueel begrip van de verschillende soorten economisch-gerelateerde bedreigingen die de Nederlandse samenleving kunnen treffen.

Onderzoeksvragen en -doelstellingen

In dit kader heeft RAND Europe van het Wetenschappelijk Onderzoek- en Documentatiecentrum (WODC) de opdracht gekregen om de relatie tussen de economie en de nationale veiligheid te onderzoeken, met daarbij de nadruk op de kenmerken en prestaties van de Nederlandse economie en de gevolgen voor de Nederlandse nationale veiligheid.

Dit rapport behandelt de volgende vijf onderzoeksvragen:

6. Hoe kan nationale veiligheid worden gedefinieerd en welke suggesties voor de belangrijkste componenten ervan vindt men in de internationale literatuur?
7. Wat leert de (wetenschappelijke) literatuur ons over de relatie tussen de economie van een land en de verschillende aspecten van de nationale veiligheid? Welke factoren, mechanismen en onderliggende causale verbanden kan men identificeren?
8. Wat is de impact van de contextuele kenmerken en factoren van een bepaald land op deze relatie?
9. Wat vertellen de antwoorden op de onderzoeksvragen 2) en 3) ons over de factoren en kenmerken die van invloed zijn op de verwevenheid tussen de Nederlandse economie en zijn nationale veiligheid?

10. Wat zijn de prestaties van Nederland met betrekking tot deze economische factoren, welke trends of ontwikkelingen kunnen we identificeren en wat betekenen die voor de nationale veiligheid van Nederland?

De analyse in dit rapport richt zich specifiek op de aspecten van de nationale veiligheid die betrekking hebben op de bescherming van de kritieke infrastructuur, kritieke sectoren, en kritieke processen die belangrijk zijn voor het duurzaam functioneren van de [Nederlandse] samenleving. De kritieke of (in Nederland) vitale infrastructuren, sectoren en processen vormen de concentratiegebieden van het beleid omtrent de nationale veiligheid, zowel in Nederland als daarbuiten.

Om de relatie tussen de macro-economische variabelen en de nationale veiligheid (zoals hierboven beschreven) te conceptualiseren, is een analytisch denkkader ontwikkeld. Dit conceptuele raamwerk vormt een kerncomponent van dit onderzoek en ondersteunt de analyse en structuur van dit rapport. Het raamwerk wordt vervolgens toegepast aan de hand drie voorbeelden van risico's die specifiek voor Nederland van belang zijn.

1. Hoe kan nationale veiligheid worden gedefinieerd en welke suggesties voor de belangrijkste componenten ervan vindt men in de internationale literatuur?

Er bestaan allerlei verschillende visies op wat veiligheid is; consensus over een eenduidige definitie is er echter niet. Dat wat men nationale veiligheid beschouwt, heeft zich in de loop der tijd ontwikkeld en is gevormd en beïnvloed door de theoretische interpretaties van de internationale betrekkingen, naast allerlei historische gebeurtenissen en trends. In algemene termen worden stabiliteit, veiligheid, bescherming en de afwezigheid van angst, bedreigingen en conflicten gezien als kernthema's die door het beleid en de wetenschappelijke literatuur onder de loep worden genomen bij hun omschrijving van nationale veiligheid. Veiligheid kan ook worden gedefinieerd in termen van de normen en waarden van mensen, met fysieke veiligheid, economische welvaart en autonoom en psychologisch welzijn als voorbeelden.

Tot het einde van de Koude Oorlog bestond de traditionele opvatting van veiligheid uit realistische verklaringen van de acties van een natiestaat en de aard van internationale conflicten. Sinds het einde van de Koude Oorlog hebben wetenschappers de definitie verbreed om die beter aan te laten sluiten op de globalisering en de omvangrijkere trends die na afloop van de bipolaire machtsstrijd zijn ontstaan. Veel aspecten hiervan zijn minder op de natiestaat en op conflicten gericht en meer op bedreigingen en risico's voor mensen. Gebieden als misdaad, gezondheid, milieuproblematiek en economische veiligheid zijn eraan toegevoegd. Hierdoor wordt nationale veiligheid geassocieerd met het voorkomen van versturende gevolgen voor de samenleving. Dit kan bijvoorbeeld gaan om de economische prestaties van een land of om kritieke processen zoals die voor de democratische besluitvorming.

Ondanks de omvangrijkere (en gedetailleerdere) wetenschappelijke definitie van nationale veiligheid zijn bij de aanpak van de bescherming van de nationale veiligheid in Nederland, en in de andere landen die hier worden vergeleken, de mensgerichte aspecten ondervertegenwoordigd. De kritieke processen die in de nationale veiligheidsstrategieën van de geselecteerde landen worden omschreven, blijven meestal beperkt tot de fysieke productie en distributie van bepaalde goederen en diensten.

2. Wat leert de (wetenschappelijke) literatuur ons over de relatie tussen de economie van een land en de verschillende aspecten van de nationale veiligheid? Welke factoren, mechanismen en onderliggende causale verbanden kan men identificeren?

Dit onderzoek stelt een conceptueel raamwerk voor dat de economisch-gerelateerde factoren vertegenwoordigt die een verstorend effect op de samenleving kunnen hebben, omdat ze de kritieke infrastructuur, sectoren en processen verstoren die essentieel voor het duurzaam functioneren van de [Nederlandse] samenleving zijn. Dit raamwerk geeft in de vorm van een aantal concentrische cirkels weer wat het optreden van bepaalde economische risico's voor de nationale veiligheid betekent (zie afbeelding A1).

Deze aanpak komt overeen met de manier waarop de opvattingen van de nationale veiligheid in moderne naties worden toegepast. In de context van de verbreding van het concept van veiligheid binnen wetenschappelijke kringen kunnen ook mensgerichte processen aan dit raamwerk worden toegevoegd, zoals mensenrechten of democratische processen.

Afbeelding A.1. Voorgesteld analytisch raamwerk van de risico's waarmee de economie de kritieke infrastructuur, sectoren en processen kan beïnvloeden.



Bron: Analyse van RAND Europe

Op basis van de analyse van wetenschappelijke, beleidsmatige en aanverwante literatuur bespreken we een aantal economisch-gerelateerde risico's voor de kritieke infrastructuren, sectoren en processen die voor beleidsmakers van belang kunnen zijn. Om de zaken nietodeloos gecompliceerd te maken, laat het conceptuele raamwerk de causale verbanden tussen de afzonderlijke factoren buiten beschouwing. Desalniettemin toont het een aantal verbanden tussen de economie en de nationale veiligheid. We hebben zeven 'risico's' geïdentificeerd. Die geven de manieren weer waarop de economische variabelen en gebeurtenissen de kritieke infrastructuren, sectoren en processen zodanig kunnen treffen dat ze de nationale veiligheid mogelijk bedreigen. De drijvende krachten achter deze risico's zijn:

- **Eigendom** (via controle en invloed): door publieke of private actoren van kritieke infrastructuren en sectoren, eigendom van bedrijfsmiddelen in de fysieke nabijheid van kritieke infrastructuren en sectoren.
- **Spionage en toegang tot vertrouwelijke informatie:** mogelijk gemaakt, bijvoorbeeld, door fysieke nabijheid of eigendom.
- **Afhankelijkheid van natuurlijke grondstoffen:** naar andere landen en actoren toe voor de toelevering van kritieke grondstoffen en energie.
- **Leveranciersspecifieke afhankelijkheid:** afhankelijkheid van bepaalde leveranciers voor de levering en het onderhoud van de kritieke infrastructuren en processen. Dit wordt verder versterkt door een tekort aan bepaalde vaardigheden en/of technologieën en gebrekkige concurrentie. Dit kan leiden tot een beperkte inspanning om de veerkracht van de kritieke infrastructuren, sectoren en processen te garanderen en daarnaast tot een stagnerende innovatie en R&D.
- **Overheidsingrijpen:** bestedingen, economisch beleid en regelgeving (of gebrek daaraan) door de overheid kunnen een grote invloed hebben op de kwaliteit, beschikbaarheid en veerkracht van de kritieke infrastructuren, sectoren en processen.
- **Corruptie en fraude:** deze kunnen de veerkracht van de kritieke infrastructuren ondermijnen en mogelijk gelegenheden scheppen voor kwaadwillende actoren om op fysieke of digitale wijze toegang te verkrijgen tot vertrouwelijke bedrijfsmiddelen en informatie.
- **Socio-economische ongelijkheid:** deze kan ontstaan als gevolg van factoren als economisch beleid of de neoliberale marktwerking. Hierdoor kunnen burgers minder goed in staat zijn om voor zichzelf te zorgen en kan ook het risico ontstaan op sociale onrust en binnenlandse instabiliteit, wat een bedreiging vormt voor de kritieke infrastructuren, sectoren en processen.

Daarnaast blijkt uit de literatuur dat verschillende wereldwijde economische en geostrategische trends ook aanleiding kunnen zijn tot risicofactoren voor de kritieke infrastructuren, sectoren en processen. Daarom moet naast een analyse van de risico's die betrekking hebben op de macro-economische gebeurtenissen en variabelen, ook met deze trends rekening worden gehouden. Tot deze trends behoren:

- **Digitale transformatie en de invoering van het industriële Internet der dingen (IoT)** vragen om extra inspanningen voor de beveiliging van de leveringsketen, de cyberveiligheid en tegen het risico op dataspionage binnen de kritieke sectoren en processen
- **Globalisering en de wederzijdse afhankelijkheid** van de kritieke infrastructuren, sectoren en processen tussen landen onderling vergroten de risico's voor de kritieke nationale infrastructuren van een land. Deze risico's kunnen ook ontstaan als gevolg van een kettingreactie na ontwikkelingen elders in de wereld

- **Internationale economische trends** spelen voor landen een essentiële rol vanwege de nauwe onderlinge verbondenheid binnen economische, zakelijke, politieke en bestuurlijke structuren. Daarnaast geven deze trends private actoren de kans om hun invloed op politieke processen en procedures te vergroten
- **Het politieke en economische model van andere naties** dat, vergelijkbaar met het protectionisme, rekening houdt met de risico's die verband houden met de verschillende nationale economische modellen en de impact ervan op het concurrentievermogen in het gebied van de kritieke sectoren en processen
- **Onzekerheid omtrent de beschikbaarheid van grondstoffen**, in het bijzonder de afhankelijkheid van buitenlandse energieleveranciers en bij de introductie van technologieën voor de opwekking, distributie en opslag van alternatieve energie
- **Potentiële zorgen met betrekking tot de integriteit en betrouwbaarheid van informatie**, wat de deur kan openen voor kwaadwillende actoren, zoals private bedrijven, om kritieke processen en procedures te verstoren, zoals verkiezingen of democratische besluitvormingsprocessen, en om binnen kritieke sectoren (zoals telecommunicatie of politieke organen) aan invloed te winnen.

Het valt buiten de afbakening van dit onderzoek om gedetailleerd in te gaan op de onderlinge verbanden tussen de macro-economische variabelen en gebeurtenissen, de drijvende krachten achter bepaalde risico's en de kritieke infrastructuren, sectoren en processen. In plaats daarvan wordt in dit onderzoek het strategische beeld van de macro-economische variabelen en gebeurtenissen en de wijzen (risico's) waarop die de kritieke infrastructuren, sectoren en processen kunnen treffen, aangemerkt als een subgroep van de middelen waarmee een staat de nationale veiligheid van zijn burgers kan garanderen.

3. Wat is de impact van de contextuele kenmerken en factoren van een bepaald land op deze relatie?

De mate waarin deze risico's in een bepaald land kunnen optreden en het belang van elke drijvende kracht voor een bepaalde kritieke sector worden grotendeels bepaald door de contextuele kenmerken en factoren van een bepaald land. De factoren die hieronder vallen zijn, onder andere, de omvang van de verschillende kritieke sectoren, de hoogte van overheidsbestedingen binnen de publieke sectoren en de mate van overheidsregulering. Zo kunnen landen die meer deregulering en een vrije markteconomie voorstaan, gemakkelijker omgaan met een private sector die een aantal kritieke diensten en processen voor haar rekening neemt. En economieën waar de staat in hoge mate ingrijpt, zullen ook binnen de kritieke sectoren en processen een meer overheidsingrijpen kennen.

Daarnaast wordt de mate van potentiële blootstelling van een staat aan de afzonderlijke risico's bepaald door de aard van de economie, de bestuurlijke structuur van het land, de mate van economische openheid (zoals de aanwezigheid van beperkingen voor de handel, kapitaalstromen, migratie, etc.), evenals andere unieke eigenschappen van de desbetreffende staat. Landen die nauw geïntegreerd zijn in een transnationale economische structuur, zoals de EU, kunnen kwetsbaarder zijn voor de impact van economische trends en ontwikkelingen binnen die structuur. In voorkomende gevallen lichten we enkele nationale verschillen uit en laten we zien wat de gevolgen ervan zijn voor de daaruit voortvloeiende analyse. Vervolgonderzoek kan worden gedaan naar de blootstelling van verschillende landen aan de verscheidene typen risico's en de gevolgen daarvan voor de nationale veiligheid.

4. Wat vertelt dit ons over de factoren en kenmerken die van invloed zijn op de verwevenheid tussen de Nederlandse economie en zijn nationale veiligheid?

De toepassing van conceptuele raamwerk op de Nederlandse context en de beoordeling van de economische risico's voor zijn nationale veiligheid vallen buiten de afbakening van dit onderzoek. Er is echter voor een voorbeeld gekozen met drie risico's die specifiek voor Nederland van belang zijn: buitenlands eigendom; gebrek aan specifieke vaardigheden voor technische en techniekgerelateerde beroepen; en internationale afhankelijk op het gebied van natuurlijke grondstoffen en voedselzekerheid.

Buitenlands eigendom. Nederland is een klein land qua oppervlakte, maar op economisch gebied is het de 18e economie ter wereld. Het is nauw geïntegreerd in de EU. Door de grote afhankelijk van de internationale handel wordt het land op zeer acute wijze blootgesteld aan wereldwijde en regionale trends, omdat het door middel van handelsrelaties sterk met andere landen en regio's is verbonden. Voor Nederland geldt dat deze mate van afhankelijkheid van internationale handel met name ook binnen de kritieke sectoren zichtbaar is. Er zijn maar weinig beperkingen in Nederland voor buitenlandse directe investeringen (FDI) en dat geldt ook voor kritieke of vitale sectoren. Hoewel deze openheid grote kansen biedt voor economische groei, technologieoverdracht, informatie-uitwisselingen en internationale samenwerking, kan FDI ook potentiële risico's voor de nationale veiligheid met zich meebrengen, doordat die de toegang tot en beïnvloeding van kritieke sectoren en processen voor buitenlandse actoren met kwade bedoelingen kan vergemakkelijken. Deze zorgen hebben geleidelijk meer aandacht gekregen binnen de Nederlandse overheid en bij het grote publiek, bijvoorbeeld tijdens het openbare debat over de overname van KPN of het huidige 5G-debat over Huawei.

Gebrek aan bepaalde vaardigheden. In Nederland, en ook binnen Europa als geheel, is vastgesteld dat betere digitale vaardigheden nodig zijn om de verspreiding van online desinformatie, waarmee de resultaten van kritieke processen en procedures kan worden verstoord, tegen te gaan. In vergelijking met het EU-gemiddelde kampt Nederland ook doorlopend met een gebrek aan beta- en ICT-vaardigheden (zogenoemde *STEM-skills*). Dit kan tot risico's leiden voor de nationale veiligheid wanneer het vermogen van kritieke sectoren onder druk komt te staan om talenten te werven en te behouden die ervoor moeten zorgen dat ze goed blijven functioneren. Nederland verwelkomt binnen de technische disciplines een hoog percentage internationale studenten. Maar als men het eigen talent niet laat groeien en ontwikkelt, kan het voor Nederland noodzakelijk worden om voor kritieke processen op buitenlandse leveranciers te moeten vertrouwen.

Internationale afhankelijkheid van natuurlijke grondstoffen. Tot slot is er een aantal gebieden waar Nederland zwaar leunt op de import van grondstoffen, zoals ruwe olie, metalen en zeldzame mineralen. Hierdoor staat het sterk bloot aan de risico's en onzekerheid rondom de toevoer van grondstoffen. Het is echter belangrijk op te merken dat er ook gebieden binnen de grondstofwinning zijn waar Nederland zelfvoorzienend is en kan voorzien in het overgrote deel, of zelfs volledige, binnenlandse consumptie door middel van de in eigen land gewonnen grondstoffen (bijvoorbeeld voor een groot aantal biomassa-producten zoals aardappelen, aardgas). Op dit punt is het risico voor de nationale veiligheid in relatie tot de afhankelijk van grondstoffen beperkt. Toekomstige ontwikkelingen, zoals het uitfasen van de aardgaswinning in Groningen bijvoorbeeld, kunnen deze buitenlandse afhankelijkheid wederom vergroten.

5. Wat zijn de prestaties van Nederland met betrekking tot deze economische factoren, welke trends of ontwikkelingen kunnen we identificeren en wat betekenen die voor de nationale veiligheid van Nederland?

De Nederlandse economie kenmerkt zich enkele eigenschappen die gevolgen hebben voor de wijze waarop risico's zich in Nederland voor kunnen doen. Zo kent Nederland een open economie met een vrije in- en uitstroom van producten, diensten en kennis. Hierdoor hebben de veiligheidsrisico's die voortkomen uit economische activiteiten binnen de Nederlandse kritieke sectoren primair betrekking op de gebieden waar men controle zou kunnen verkrijgen over en aan invloed zou kunnen winnen binnen de publieke, strategische of kritieke belangen van de staat. Het analytische raamwerk dat in dit rapport wordt geïntroduceerd, biedt een handvat om deze risico's af te leiden.

Bij de bescherming van deze kritieke sectoren, infrastructuren en processen kan men een aantal afwegingen herkennen. Zo kunnen bepaalde maatregelen ter bescherming van de nationale veiligheid gepaard gaan met negatieve economische en/of financiële gevolgen. Wat de uitdagingen rondom deze afwegingen verder bemoeilijkt is de complexe aard van de onderlinge afhankelijkheid van de verbindingen tussen het economische domein en dat van de veiligheid. Hierdoor is het nagenoeg onmogelijk om vooraf (*ex ante*) vast te stellen waar het nationaal economisch belang eindigt en waar een belang van de nationale veiligheid begint.

Het analytische raamwerk dat in dit rapport wordt gepresenteerd, biedt een mechanisme om de verbindingen tussen de economie en de nationale veiligheid in Nederland te begrijpen. Het is echter belangrijk om daarbij op te merken dat de macro-economische variabelen in de loop der tijd kunnen veranderen en dat ook nieuwe variabelen kunnen opduiken. Daarom moet men bij het toepassen van het raamwerk binnen de Nederlandse context rekening houden met potentiële veranderingen van de risico's en met de nationale omstandigheden waarbinnen die worden toegepast.

Voortbordurend op het analytische raamwerk zou nader onderzoek een uitgebreider en gedetailleerder begrip kunnen opleveren van de complexe interacties tussen de verschillende elementen van de economie en de nationale veiligheid. Desalniettemin biedt het raamwerk en de ondersteunende analyse in dit rapport een gestructureerde methode om de relaties tussen de economie en de nationale veiligheid op een strategisch niveau in kaart te brengen.

Acknowledgements

This report could not have been completed without the input of a number of individuals. The authors would especially like to thank Dr Casper van Nassau (Research and Documentation Centre, WODC), Ben Govers (Nationaal Coördinator Terrorismebestrijding en Veiligheid, NCTV), Dr Otto Holman (University of Amsterdam), Dr Thomas Eimer (Radboud University) and Prof Jaap de Wilde (University of Groningen) for their thoughtful and constructive feedback throughout the study as members of the Scientific Advisory Committee and for their suggestions on relevant literature and stakeholders.

The study team also solicited information through consultation with policy and academic experts. The study team would like to thank all stakeholders and experts who provided their insights as part of key informant interviews, and for their positive engagement with the study. Interviewees for this study are listed in Annex A of the report, although some have chosen to remain anonymous.

The study team are grateful for the support of others within RAND Europe, including, most notably, our Quality Assurance (QA) reviewers, Dr Christian van Stolk and Kate Cox, for providing helpful and constructive criticism and feedback throughout the design, analysis and reporting of this study. The authors are also grateful to Marina Favaro for providing research support in the course of this project, and for Joris Lenstra for his translation services and for copy-editing the report.

Though all these contributions have been essential to the delivery of this study, any errors contained in this report are the sole responsibility of the authors.

1. Introduction and context

This introductory chapter provides an overview of the context, purpose and scope of this study on the relationships between the economy and national security. It outlines the definitions, research objectives, methodological approach, assumptions, caveats and structure of this research report. As per the scope of this work, this study is intended to support the *Nationaal Coördinator Terrorismedbestrijding en Veiligheid's* (NCTV) in conceptualising the concept of economic security based on a broad and international range of perspectives.

1.1. Thinking about economic security in the Netherlands

The interconnections between national security and the economy have grown as globalisation and economic integration have increased over the last decades (see Chapter 2 for more detail). For an open economy like the Netherlands, these interconnections manifest themselves both as opportunities and possible threats to national security (as shown in more detail in Chapter 4). Over the last decade, economic security has become a key strategic priority of the Dutch government, with the connection between economic security and broader national security made explicit in the 2007 National Security Strategy, and highlighted even more strongly in the recent National Security Strategy (2019).¹ The International Security Strategy of 2013 explicitly emphasised the interconnectedness of the Dutch economy with internal and external threats (including EU and global threats) and risks, and the potentially large impact of economic events on the country's stability, welfare and security.² In the Integrated International Security Strategy 2018-2022 (IISS) published in March 2018, the current coalition government reiterated the growing international interdependencies within Dutch national security.³ 'Threats to vital economic processes' are listed as one of the six most urgent security threats affecting the country.⁴

Recent events of planned foreign investments into strategic sectors within the Netherlands have prompted detailed assessments of potential risks to national security that may emerge as a result of economic activity

¹ Ministerie van Binnenlandse Zaken (2007); National Coordinator for Security and Counterterrorism (2019d). For details on the Dutch approach to National Security as outlined in Dutch policy documentation, please see Annex C.

² Ministerie van Buitenlandse Zaken (2013).

³ Ministerie van Buitenlandse Zaken (2018).

⁴ Ministerie van Buitenlandse Zaken (2018, p.21).

such as trade, foreign direct investment (FDI) and others. In 2013, the question of potentially undesirable foreign acquisition and investment was raised in relation to the (failed) acquisition of KPN, a telecommunications company, by América Móvil, a Mexican company.⁵ Currently, potential risks to national security are being discussed within the EU as a whole and in the Netherlands specifically in relation to potential procurement of the 5G network and equipment from Chinese company Huawei (see Chapter 3 for details). Given the importance of certain sectors (such as telecommunications) to the effective functioning of the Dutch society,⁶ there is a need for a deeper understanding of the types of economy-related threats to Dutch society.

1.2. An approach to understand the links between macroeconomic variables and national security

Both ‘national security’ and ‘the economy’ are broad concepts that are subject to a variety of interpretations across different academic disciplines, and in science, policy, society and culture. It is not possible within the limits of this study to cover all of these interpretations comprehensively.⁷ While a brief overview of academic and policy definitions of ‘national security’ is provided in this report (see Chapter 2), we decided – in consultation with the study’s Scientific Advisory Committee (SAC) – to focus the analysis of economy-related threats to national security through the lens of the protection of critical infrastructure, sectors and processes that are important for the sustainable functioning of society. This approach is consistent with the approach taken to operationalise the protection of national security in many nation states,⁸ and indeed, in line with the focal areas of NCTV as outlined later in this section. In order to conceptualise the relationship between macroeconomic variables and national security as outlined above, the research team developed an analytical framework and applied it to the Netherlands using an illustrative example of three risk vectors⁹: 1) foreign ownership; 2) skills gaps; and 3) natural resources dependence. These risk vectors were selected in consultation with SAC on the basis of perceived relevance to the Netherlands.

⁵ De Witt Wijnen (2018).

⁶ For example as shown in the Wet beveiliging netwerk- en informatiesystemen (see Overheid.nl, 2019).

⁷ For reference, a comprehensive analysis of the concepts of security – including national security – is available in the Reconceptualising Security report under the EU FP7 programme on ‘European Security Trends and Threats in Society’ (see De Spiegeleire et al., 2012).

⁸ Such as Russia, the UK and US. The national security approaches of example nation states are examined in Annex B.

⁹ For the purpose of this study, risk vectors are understood as sources of risk arising from macroeconomic developments of events; in other words, the avenues through which national security risks can be manifested. This report identifies seven broad risk vectors that may impact the national security of a country: ownership; espionage and access to sensitive information; natural resource dependence; supplier dependence; government intervention; corruption and fraud; and socio-economic inequality. These are outlined in Chapter Three. Following consultation with the SAC, the risk vectors that are examined specifically in the Dutch context are: foreign ownership; skills gaps in technical and related professions; and natural resources and food security.

Critical infrastructure, sectors, and process are concepts that are currently widely used in policy and legislation, in the Netherlands and beyond.¹⁰ In 2002, the protection of critical infrastructure (or in Dutch: *beveiliging vitale infrastructuur* [BVI]) was highlighted as a major policy focus in the Netherlands, following the establishment of the Government's Critical Infrastructure Project (CIP).¹¹ In the first report of the CIP published in 2003, critical infrastructure was considered to be the overarching term for 11 critical sectors (such as energy, telecommunication, water, but also public order, rule of law, governance), and 31 critical products and services (including electricity, internet access, armed forces, prosecution and detention).¹²

Later, critical infrastructure was determined by the Dutch government to consist of all the critical processes that, if disturbed or interrupted, would cause severe societal disruption and a threat to national security.¹³ These processes are grouped by the NCTV in two categories, A and B, based on anticipated impact. Category A consists of: national transport and distribution of electricity; production, national transport and distribution of gas; oil supply; drinking water supply, flood defence and water management; and storage, production and processing of nuclear materials.¹⁴ Category B includes regional distribution of electricity and gas, military and police deployment, high-value transactions between banks, and internet connectivity.¹⁵

This understanding of critical infrastructure has placed a strong emphasis on clearly discernible economic processes (such as production of goods and services). Much less represented in the 'critical infrastructure' terminology are concepts such as the democratic process, voting, or equal accessibility. If we would see these as part of our set of dependent variables, it would not be hard to argue that these would be affected by economic factors (such as concentration of power in certain markets or foreign influence in ownership) and as such can be considered as critical processes. This analysis concurs with the overall broadening of the term security as outlined in Chapter 2. In this context, definitions of critical sectors, infrastructure and process are adopted for the purpose of this study. These definitions are provided in Box 1.¹⁶

¹⁰ Originally, the concept was introduced as part of the efforts to counter the impact related to ICT millennium problems.

¹¹ Luijff et al. (2003).

¹² A full list of the 11 critical sectors and 31 critical products and services can be found at: Luijff et al. (2003).

¹³ For a full list of all Category A and B processes, see: National Coordinator for Security and Counterterrorism (2019a).

¹⁴ National Coordinator for Security and Counterterrorism (2019a).

¹⁵ For a full list of all Category A and B processes, see: National Coordinator for Security and Counterterrorism (2019a).

¹⁶ National Coordinator for Security and Counterterrorism (2019a).

Box 1. Definitions of critical sectors, infrastructure and processes

Critical sectors are sectors whose assets, systems and networks (whether physical or virtual) are considered so vital that their incapacitation or destruction would have a debilitating effect on national security, the functioning of the economy and society.¹⁷ For the purpose of this report, critical sectors are understood to include: the emergency services sector, the energy sector, financial services sector and communications sector, as well as the defence industrial base and the political and democratic spheres.¹⁸

Critical infrastructure is an asset or system that is essential for the maintenance of vital societal functions or processes. The damage to a critical infrastructure, its destruction or disruption by natural disasters, terrorism, criminal activity or malicious behaviour, may have a significant negative impact for the security of the nation or the EU and the well-being of its citizens.¹⁹

Critical processes are those processes that could result in severe social disruption in the event of their failure or disruption.²⁰ Such processes may include production processes of specific products that are vital to society (for example agricultural products or certain chemicals), the distribution of commodities (for example electricity or drinking water) or the provision of vital services (for example healthcare or emergency services). But they may also include more fundamental processes that are vital for the orderly functioning of society, such as public decision-making or democratic processes (for example elections).

In the globally interconnected and interdependent world, the economy is intimately connected with both national and international security: economic security is an important component of national security (see Chapter 2). The economy influences national security by shaping the functioning of the society internally, as well as by influencing the broader geopolitical place of a country internationally. In this study, the focus is on the ways in which economic factors influence national security as defined earlier, that is, the protection of critical infrastructure, sectors and processes that are important for the sustainable functioning of the society. As such, the factors and concepts underpinning ‘the economy’ for the purposes of this study include those that have an impact on the sustainable functioning of society. In line with a model-based approach to the scope of this study, ‘national security’ can be considered the dependent variable, whereas the economic factors are the independent variables. Whilst we acknowledge that the relations between the economy and national security are not linear – there are various feedback loops – for the purpose of this study we have chosen to place less emphasis on the subsequent impact of national security on the economy.

To identify the relevant factors, we conducted a review of relevant academic textbooks on the principles underpinning macroeconomic theory, economic growth models and international economics,²¹ and a general review of literature relating to risk factors affecting the functioning of critical infrastructure, sectors and processes (and hence the overall functioning of the society). As a result, the following economic variables and concepts (the ‘economy’) are analysed in more detail in relation to their connections with national security, and are detailed in Box 2 below.

¹⁷ Adapted from U.S. Department of Homeland Security (2019).

¹⁸ Ronis (2011).

¹⁹ European Commission (2019b).

²⁰ National Coordinator for Security and Counterterrorism (2019a).

²¹ For example: Mankiw (2015), Krugman et al. (2009), Jones et al. (1998).

Box 2. Economic variables

The following variables are those that constitute 'the economy' for the purpose of this report. As such, these variables underpin the definition of 'the economy' within this study, for the purpose of examining its relationship with national security:

- Domestic investment and consumption, and employment;
- Foreign direct investment;
- Global economic trends, government spending and regulation;
- Human capital;
- International trade; and
- Technological progress.

The ways in which these economic factors are linked with national security (in the limited sense)²² are explained in Chapter 3 and explored with specific reference to the Netherlands in Chapter 4. Within the broad definition of security outlined above, a multitude of national security risks can be identified from the conceptual framework presented in Chapter 3. A full assessment of these risks is beyond the scope of this report and we therefore focus our analysis on three examples to illustrate the use of the conceptual framework. The examples have been selected in consultation with the Scientific Advisory Committee (SAC) on the basis of the relative importance of the risk vectors in the Netherlands.

1.3. Research questions and research steps

The principal goal of this study is to provide the WODC and the NCTV with insights from academic and policy literature on the relationship between the economy and national security, and the ways in which national or international economic policy can influence national security in general, and in the case of the Netherlands in particular. To this end, the study team structured the research according to five research questions (RQs) as shown in Table 1.1.

²² Due to the complex, interconnected and non-linear nature of these relationships, as well as the scope of this study, it is not possible to provide a comprehensive overview of the multitude of complex ways in which these economic factors are linked with international security. Instead, this report provides a streamlined account of the most prominent ways in which these variables interact.

Table 1.1. Research questions

| Research questions | |
|--------------------|---|
| 1 | How can national security be defined and what does the international literature suggest about its main components? |
| 2 | What can be learned from the (academic) literature about the relationship(s) between the economy of a country and the various aspects of national security? Which factors, mechanisms and underlying causal mechanisms can be identified? |
| 3 | What is the impact of contextual, country-specific characteristics and factors on this relationship? |
| 4 | What do the answers to research questions 2) and 3) tell us about the factors and characteristics that have an impact on the interconnections between the Dutch economy and its national security? |
| 5 | How does the Netherlands perform with regard to these economic factors, which trends or developments can we identify, and what do they mean for the national security of the Netherlands? |

In order to answer these research questions, we deployed a number of research activities:

- **Task 1: Definition and scoping** involved an extensive review of academic and policy literature to capture the different ways in which ‘national security’ can be conceptualised. The results of this review are summarised in Chapter 2. To complement the information gathered through the literature review, the study team also conducted nine interviews with relevant academic and policy experts (see Annex A) to solicit further information on the definitions of ‘national security’ and the interconnections between national security and the economy. The results of Task 1 principally informed RQ1.
- **Task 2: Targeted literature review** on the links between economic variables and national security as defined in Task 1. This review focused on academic and grey literature,²³ with an explicit emphasis on threats to critical infrastructure, sectors and processes as components of national security. Outputs of Task 2 principally informed answers to RQ2 and RQ3.
- **Task 3: Development of analytical framework** to capture the relevant interconnections and mechanisms between economic variables and national security. Drawing on insights from the literature review (Tasks 1 and 2), the study team conducted two internal analytical workshops in which the insights from literature were mapped into a logical framework, exploring the links between the economy and national security by means of specific risk vectors (see Chapter 3 for the analytical framework and the detailed descriptions). Outputs of Task 3 principally informed answers to RQ2 and RQ3.
- **Task 4: Targeted literature review and analysis of the Netherlands** was performed to understand how three exemplary risk vectors may manifest themselves in the context of the Netherlands and what

²³ ‘Grey literature’ refers to literature that is not published in peer-reviewed academic journals and includes – for example – policy papers, research reports, government white papers and evaluation reports.

vulnerabilities may be present in the Dutch context vis-à-vis these vectors. Outputs from Task 4 informed answers to RQ4 and RQ5 and are presented in Chapter 4.

1.4. Structure of this report

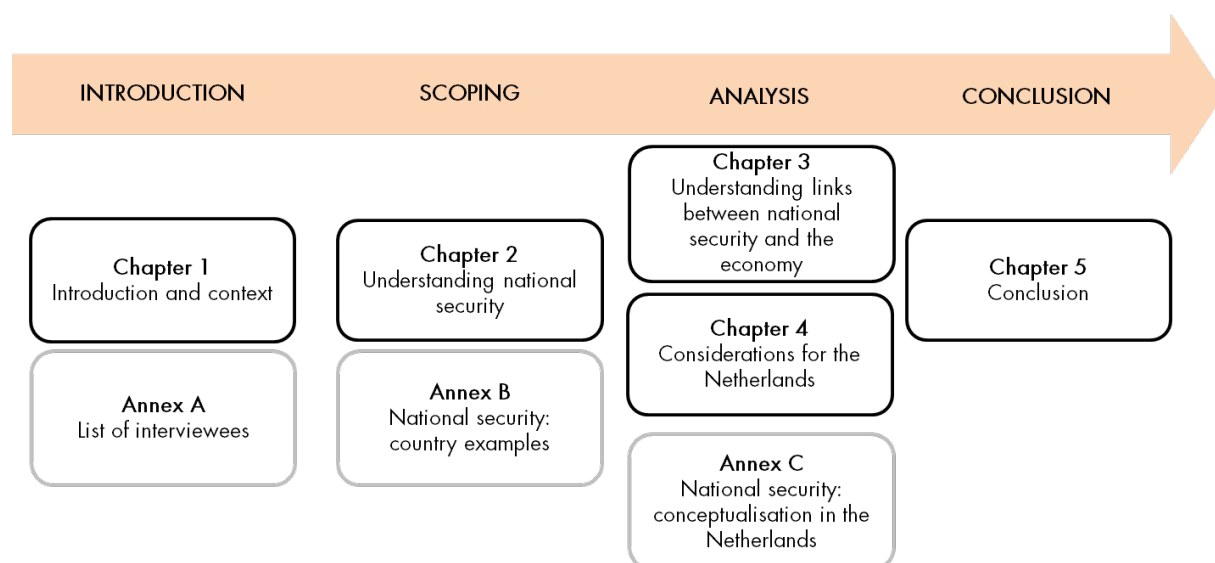
This report presents the findings from the research undertaken for this study. In addition to this chapter, it is structured as follows:

- **Chapter 2 – Understanding national security:** provides an overview of the different understandings of national security in the academic and policy context, drawing on the work of scholars in international relations and a review of strategic documents of selected countries.²⁴ This chapter also highlights the importance of economic security for the functioning of a society, facilitated by critical infrastructure, sectors and processes.
- **Chapter 3 – Interconnections between national security and the economy:** sets out the analytical framework proposed by the study team and developed for the purposes of this study to capture the ways in which economic factors affect national security and describe their manifestation. The chapter then presents a detailed overview of the sources of risk stemming from macroeconomic developments and events that could affect critical infrastructures, sectors and processes.
- **Chapter 4 – The links between economy and national security in the Netherlands:** includes an analysis of some of the main relevant risks for the Netherlands, highlighting some of the most relevant risk vectors for the Dutch context. To illustrate the use of the conceptual framework, we focus our analysis on three examples of risk vectors.
- **Chapter 5 – Conclusion:** highlights overarching conclusions by means of answering the individual research questions.

Figure 1.1 presents a schematic illustration of the structure of this report.

²⁴ The focus countries of this report represent a non-systematic selection of exemplar countries in Europe and global powers, and were also selected on the basis of the availability of relevant strategic documents. The selected countries are: Australia; Canada; China; Denmark; France; Germany; Russia; Singapore; Sweden; United Kingdom; and the United States.

Figure 1.1. Report structure



2. A historical perspective on definitions of national security

There is no single, unifying definition of ‘national security’ in academic literature. As a concept, it is considered from a range of different angles including social sciences, psychology, security studies, crime and policing research, and others. To meet the requirements of this study, the research team narrowed the focus of the literature review to scholarship within the fields of international relations and political science. In these fields, it is clear that the definition of national security has evolved over time – and continues to evolve – with contextual factors playing an important part in shaping its definition. As such, this chapter first considers the historical evolution of the understanding of national security, by presenting an overview of the main schools of thought and examining how contextual factors have shaped these understandings over time. The chapter then turns to a brief overview of how national security is currently understood by selected countries.²⁵ The findings of this chapter are supplemented by Annex B, which includes a more detailed analysis of selected countries’ understandings of national security as captured by their policy and strategic documents.

2.1. Scholarly thinking about national security until the 19th century

The early thinkers who discussed concepts closely related to the idea of what we would now refer to as ‘national’ security were not theorists of international relations *per se* (although they are often associated with international relations theory), but politicians and philosophers who sought to understand how the world works and explain the interactions they observed between people, cities, states and other actors.

Writing in the 5th century BC, Thucydides discusses Sparta’s fear of the growing power coming from Athens and the appreciation that the more powerful actor prevails.²⁶ Writing in the 16th century AD, political theorist Niccolò Machiavelli – in his seminal book *The Prince* – portrays a leader having to do whatever is necessary to protect his position from men who threaten him and the security of his realm.²⁷ In his most famous work *Leviathan* a century later, Thomas Hobbes builds on Machiavelli’s writings by declaring that the natural state of the world is a state of war where there is a constant fear of conflict and death.²⁸ Thomas Hobbes described the world as one with a ‘dissolute condition of masterless men without

²⁵ The selected countries are: Australia; Canada; China; Denmark; France; Germany; Russia; Singapore; Sweden; United Kingdom; and the United States.

²⁶ Walt (2010), Thucydides (originally published 416 BC).

²⁷ Walt (2010), Machiavelli (originally published 1532).

²⁸ Lloyd & Sreedhar (2018).

subjection to laws and a coercive power to tie their hands from rapine and revenge,²⁹ which creates a ‘continual fear, and danger of violent death; and the life of man, solitary, poor, nasty, brutish, and short.’³⁰ In the Hobbesian world, people live in a primitive ‘state of nature’ – they are driven by selfish desire and, in the absence of law and order, would kill and themselves be at constant risk of being killed. This creates a world where humans are driven into ‘deadly competition for scarce goods by an infinity of desires and an unlimited passion for securing what they want.’³¹

Security itself is rarely referred to in these writings, and certainly not given an explicit definition. Given that ‘nation states’ as we know them did not yet exist in their current form, we cannot talk of ‘national’ security in the same way as today. One might say that, in the world where power and competition prevail, security (or rather lack of it) could be viewed as the constant fear of violence and death – with the source of this insecurity potentially coming from all fellow humans. The emergence of the state can then be seen to create some order, which aims to prevent this animalistic behaviour at the individual level. However, states are also comprised of leaders who are merely flawed humans themselves. Thus, states can be seen to act on the international scene in a way akin to that of humans in the state of nature or ‘the natural condition of mankind’.³² This understanding informs some of the core themes in the realist theory of international relations, which sees the actors on the international scene (in most cases states) as motivated by conflict and competition and mankind’s desire for power (*animus dominandi*).³³ As a result, on an international, inter-state level, states are seen as having to act selfishly in order to provide security for themselves – that is, concerned primarily about their own national security.³⁴

2.2. Understanding of interconnectedness between security and the economy in the 20th century

With the prevalence of war and conflict and proliferation of the nation state throughout the 19th and early 20th centuries, realist explanations of behaviour among states and other political actors dominated the discourse, highlighting the importance of national self-preservation, often in opposition to dependence on other states or other actors.

Realism

The publication of Carr’s *The Twenty Years’ Crisis* in 1939 saw classical realism becoming more formalised.³⁵ Moving slightly away from the Hobbesian and Machiavellian thinking of humanity’s innate desire for power and flawed nature, Carr believes the lack of security in the world is caused by differing endowments of resources and governmental structures, conflicting ideologies, and the thirst for power of

²⁹ Hobbes (1996; originally published 1651).

³⁰ Hobbes (1996, 110).

³¹ Hoffmann (1963, 318).

³² Hobbes (1996)

³³ Korab-Karpowicz (2018), Morgenthau (1946, 192); Jervis (1994).

³⁴ Walt (2010); Elman (2008).

³⁵ Elman (2008), Carr (1940).

certain individual leaders.³⁶ These ideas echoed those of the philosopher Jean-Jacques Rousseau, who singled out two main factors of insecurity between states: interdependence and inequality.³⁷ As states become dependent on one another this creates suspicion and incompatibility, and the unequal allocation of resources helps drive conflict.³⁸ Essentially, this thinking builds upon the early theories of individual behaviour and applies similar principles to the behaviour of states.

In the second half of the 20th century, Kenneth Waltz established a new school of thought to build upon the ideas of classical realism, known as neorealism, arguing that the lack of an overall authority means in order to survive in the anarchic world, states have no choice but to act via self-serving means.³⁹ Waltz places less emphasis on the desire for power, instead arguing that states only concern themselves with the pursuit of power after national security has been achieved.⁴⁰ This spurred two conflicting ideologies around what this means for how states act. On one hand, defensive realists argue that this self-interested pursuit of national security pushes states into acting cooperatively where possible, and maintaining the status quo.⁴¹ Offensive realists, led by Mearsheimer, disagree with this view, arguing this is more likely to encourage states to seek power in order to deter the external threat.⁴²

In summary, within realist thought, certain common themes appear in relation to national security. Inter-state aggression, the fear and threat of violence from enemy states, and a focus on the military and conflictual aspects of security are all factors that a state needs to respond to in order to preserve itself and its security – that is, the security of its borders, resources and people.⁴³ Despite ‘security’ being the more frequently used term prior to the Second World War (WW2), ‘national security’ was deemed synonymous with ‘security’ as the realist theory focused principally on the nation state.⁴⁴ Furthermore, prior to the growth of international organisations such as the UN, strategists and policymakers were employed only at the national level, and were tasked with matters of security concerning a very state-centric view, reinforcing the idea that security should be considered predominantly from a national perspective.⁴⁵

Liberalism

In addition to realism, other schools of thought have also engaged in the discourse on national security. With the establishment of the League of Nations,⁴⁶ liberalism as a school of thought – primarily inspired by the philosophical writings of Immanuel Kant – began to gain prominence within international

³⁶ Walt (2010).

³⁷ Walt (2010, 321).

³⁸ Walt (2010, 321).

³⁹ Waltz (2010).

⁴⁰ Walt (2010).

⁴¹ Elman (2008).

⁴² Mearsheimer (2001).

⁴³ Walt (2010); Mearsheimer (2002); Sachs (2003); Singh & Nunes (2016).

⁴⁴ Singh & Nunes (2016).

⁴⁵ Buzan (2008).

⁴⁶ Navari (2008, 32).

relations and political discourse.⁴⁷ Like realism, there are many different sub-theories underneath the umbrella of liberalism, but broadly speaking, liberalism places emphasis on the relationship between the state and international society and the importance of interdependence between states and other actors.⁴⁸ On the whole, according to the liberal standpoint, people prioritise well-being and self-preservation which, in turn, creates a shared common goal. To realise this, based on the liberal viewpoint, people must be able to make their own decisions as long as they do not detract from another's freedom; hence, liberal thinking emphasises the need for cooperation and prevention of conflict.⁴⁹ The Dutch legal scholar Hugo Grotius emphasised the idea that individuals bear rights, particularly when it comes to ownership of physical goods such as land and property.⁵⁰ The interactions of sovereign states are bounded by the rules and institutions of their own making; hence there is a natural acceptance of the importance of cooperation and coexistence on the international stage.⁵¹ As a result of his beliefs, Grotius championed the idea of creating international institutions.⁵² Via these, Grotius was one of the first to argue for free trade, stipulating that free trade between nations will foster cooperation and lead to international peace.⁵³ As such, his writings indicate that a strong link exists between the economy and security and that it is possible that security can be achieved via economic means.⁵⁴

Within the context of international relations and politics, liberalism is thus more concerned about the role of international organisations and the benefits of international cooperation, which are often motivated by or at least accompanied by economic cooperation (e.g. through international trade). A fundamental argument put forward by Kant was that the balance of power is a peacekeeper; any ruler's desire to conquer comes with the ultimate goal of achieving peace.⁵⁵ Liberalism underpins other closely related theories. These include the foundations of democratic peace theory – the idea that democracies are less likely to go to war with each other since they share the same values – and liberal institutionalism, which argues that international institutions play a very important role in mitigating conflict.⁵⁶

Constructivism

Recent major developments to the international relations and security studies literature have included the growing importance of the constructivist approach, which applies theories of social constructivism within the field of security studies. This approach advocates that national security should be thought of as a socially constructed phenomenon, whereby threats are brought into being due to social aspects (such as

⁴⁷ Baylis et al. (2017).

⁴⁸ Moravcsik (2001).

⁴⁹ Owen (1994).

⁵⁰ Miller (2014).

⁵¹ Haftendorn (1991).

⁵² Haftendorn (1991).

⁵³ Thumfart (2009).

⁵⁴ Salter (2001).

⁵⁵ Navari (2008, 31).

⁵⁶ Owen (1994); Navari (2008); Owen (2017).

identity, norms and culture) rather than being defined in terms of some abstract set of security criteria.⁵⁷ Constructivism tends to perceive that the identities and actions of the main actors in world politics are defined and guided by norms.⁵⁸ It is a broad field encompassing a variety of perspectives on the scope and nature of national security. In one of the foundational texts of constructivist theory, *Anarchy is what the state makes of it*, Alexander Wendt argued that the anarchic state-based international political system is socially constructed; by extension, therefore, national security interests are likewise a social construct.⁵⁹ This 'systemic' approach focuses on state interactions at the international level but does not examine 'non-systemic' factors such as domestic political culture.⁶⁰ Other constructivist approaches place greater emphasis on the domestic factors that shape security outcomes, such as Katzenstein's notion of the role of domestic identity, norms and culture in the construction of national security interests, although, similar to Wendt, this approach ultimately retained a focus on the state as the primary actor in national security.⁶¹ Constructivist thought largely falls within one of two fields: 'conventional constructivism' (including Wendt), which explores the role of norms and identity in shaping the international system and its outcomes, and explores the drivers behind certain decisions and courses of action; and 'critical constructivism', which examines the ways in which threat perceptions and the object of security are socially constructed, emphasising language and discourse.⁶² The latter category is often considered to fall within critical theory. In this regard, there is considerable overlap between constructivist and critical theory within the field of security studies.

Critical Theory

A closely related concept to constructivism, critical theory emerged as a major theoretical framework during the post-Cold War period.⁶³ It addresses the limitations of previous interpretations of security by recognising that security has different meanings for different actors,⁶⁴ and it challenges traditionally state-centric accounts of security.⁶⁵ Traditionally, security studies have looked at threats from an objective point of view, but critical approaches aim to analyse why certain threats are prioritised differently.⁶⁶ Essentially, critical theorists understand that 'security' as a word or idea is empty in itself, since its meaning is defined by the context in which it is used.⁶⁷ Critical theory encompasses a broad range of perspectives such as feminist theory, poststructuralism and post-colonialism.⁶⁸ Two prominent schools of thought within

⁵⁷ McDonald (2008).

⁵⁸ Farrell (2002, 52).

⁵⁹ Wendt (1992).

⁶⁰ Karacasulu and Uzgören (2007).

⁶¹ Karacasulu and Uzgören (2007).

⁶² Adler (2005).

⁶³ Olivares (2018).

⁶⁴ Bilgin (2008).

⁶⁵ Olivares (2018).

⁶⁶ Fierke (2017).

⁶⁷ Consultation with Prof Jaap de Wilde.

⁶⁸ C.A.S.E Collective (2006).

critical theory are the Welsh (or Aberystwyth) School and Copenhagen School. The Copenhagen School draws heavily on constructivist theory, exploring security as a socially constructed phenomenon, and introducing the notion of ‘securitisation’; namely, the practice of state actors elevating issues of domestic-level politics into issues of high politics that impact states on the national level, thereby transforming them into issues of national security.⁶⁹ For example, a critical approach of the Copenhagen School can be applied in order to understand how security has been used to push specific security agendas through ‘securitisation’ (a prime example being using security as a ‘speech act’⁷⁰ to initiate a war on terror in the aftermath of the 9/11 terror attacks).⁷¹ With security being used as a political tool in this or similar ways, security gains a new dimension, potentially pulling it away from traditionalist state-centric thinking.⁷²

In *Security: A New Framework for Analysis*, one of the seminal texts outlining the views of the Copenhagen School, Barry Buzan, Ole Waever and Jaap de Wilde propose that the referent object of security should be extended beyond the state, and that the definition of security should be broadened to also incorporate new dimensions such as societal, environmental and economic security.⁷³ The Welsh School also argues for a broader definition of security. However rather than the notion of societal security as advanced by Copenhagen School, the Welsh School focuses on human emancipation and views the individual as the referent object, and the state as the means for ensuring this security.⁷⁴

New times inevitably lead to structural changes in the world order, which requires analysis of International Relations (IR) from a new vantage point.⁷⁵ An increasingly globalised world has created a ‘plurilateral’ structure where individual states no longer have the influence they previously did, and are instead part of a system that is constantly evolving beyond the control of single state actors. ‘Interpolarity’, a contemporary opinion offered by Giovanni Grevi, theorises that the combination of multipolarity and increasing globalisation is changing IR. Using key themes from realism, Grevi seeks to combine this with modern views of an increasingly globalised and interdependent world. As the power dynamic between states shifts, it is uncertain whether this will ultimately lead to more peace or further conflict.⁷⁶ Cooperative solutions, collective security,⁷⁷ international institutions, a clearer focus on economics, and international politics are all key to analysing this evolving situation, with the role of any single state in addressing complex challenges recognised as limited. As such, the emphasis in this line of thinking is shifting again from a state-centric perception of national security to one that is fundamentally oriented around the role of the economy and international institutions.

⁶⁹ Romaniuk (2018).

⁷⁰ Within the Copenhagen School, a ‘speech act’ is defined as a ‘securitising move’; namely, a statement that identifies a given phenomena as a matter of ‘security,’ thereby elevating it to a special status and legitimising extraordinary measures. See: Waever (1995); Buzan et al. (1998).

⁷¹ Consultation with Prof Jaap de Wilde.

⁷² Consultation with Prof Jaap de Wilde.

⁷³ Buzan et al. (1998).

⁷⁴ Hama (2017).

⁷⁵ Hama (2017).

⁷⁶ Grevi (2009).

⁷⁷ Grevi (2009).

Critical Political Economy

Critical Political Economy (CPE) is a theory that has gained prominence in the academic debate surrounding the intersection between economic and security studies. CPE may be considered a field of critical theory, but falls outside the traditional scope of critical security studies. The fundamental premise of CPE is the mutual constitution of the economic and political sphere, and the security threats posed by the unequal division of power and welfare.⁷⁸ Within this conceptual framework, CPE theorists highlight the risks (in both academic and policy terms) of treating the economy and national security as separate fields.⁷⁹ Early CPE thinker Susan Strange viewed security as one of the four 'distinct but related' power structures within the global political economy.⁸⁰ She defined this security structure as the framework of power that is created via the provision of security (from common dangers such as violence) to the population.⁸¹ From this supply of security, the benefactors derive power over those they protect.⁸² In this regard, structural power is held by the entity that is responsible for the provision of security (traditionally understood to be the nation-state). A central proposition of CPE theory is that structural power of nation-states has been eroded by the integration of national economies into the globalised economy, with power thus shifting to non-state actors, such as transnational corporations.⁸³

CPE theorists such as Cutler have criticised Westphalian assumptions of state-centricity and the 'liberal mythology' that neglects to include the private sphere as a political domain, suggesting that state-based definitions of authority are insufficient for capturing the structural power of private non-state actors in the global political economy.⁸⁴ CPE emphasises the structural power of actors in advanced economies who hold dominant positions within the 'production structure' (control over the production of goods and services required for survival) and 'financial structure' (control over the supply and distribution of credit).⁸⁵ CPE theorists have therefore challenged Realist understandings of the state-based international system, with Cutler and Pritchard reframing anarchic world politics as a system of complex, multi-layered and overlapping structures, processes and agents (such as multinational corporations) that increasingly erode the capacity of nation-states to control and manage global affairs – and, by extension, their domestic security.⁸⁶

⁷⁸ van Apeldoorn and Horn (2018).

⁷⁹ Strange (1970).

⁸⁰ The four power structures as posited by Strange are: the security structure; the production structure (the structure by which wealth is produced and distributed in the global economy); the financial structure (the sum of all arrangements governing the availability of credit and the determining factors of the terms of currency exchange rates); and the knowledge structure (the relations under which knowledge is produced, stored and communicated). For further details, see Strange (1970) and Revell (2006).

⁸¹ May (2008), Revell (2006).

⁸² Revell (2006).

⁸³ Strange (1970).

⁸⁴ Cutler (2001).

⁸⁵ Gwynn (2017).

⁸⁶ Cerny and Pritchard (2017).

When viewed through a CPE lens, the security of the state may be threatened by the unequal divisions of power and welfare, and the private actors – such as transnational corporations – that are able to influence these conditions. In this regard, CPE challenges traditional understandings of national security threats as those that primarily emanate from malicious actors – such as other nation-states – and also considers private corporations as both providers of, and possible threats to, national security. The blurring of lines in matters of national security between the public and private, and the influence of large corporations, is termed by Verstein as ‘National Security Corporate Governance’. This refers to the outsourcing of a country’s national security functions to private actors, leading to corporate boardrooms quietly becoming ‘instruments of national defence’.⁸⁷ When examining national security through a CPE perspective, in order to understand the influence of market forces on the security sphere it is important to consider the economic and institutional context of the country in question. Through comparative political economy, the ‘varieties of capitalism’ (VoC) approach set forth by Hall and Soskice in 2001 presents two types of capitalist market economies: liberal market economies (including Anglo Saxon countries, such as the United Kingdom (UK) and US), and coordinated market economies (CME), including the Netherlands, Germany and Scandinavian countries.⁸⁸ These two variants have an impact on both economic performance and many areas of policymaking that relate to national security, including macroeconomic policy, social policy, legal decision-making and international relations.⁸⁹

2.3. A shift towards a more ‘human-centric’ focus

Security more broadly, and national security specifically, are terms that derive their meaning not only from theoretical views and explanations, but also from contextual factors such as historical events and developments.

Despite there being a long and developed discussion of the theories that seek to explain international relations and politics, there has been little literature on what the definition of national security is.⁹⁰ In addition, though concepts related to security were indeed prominent before WW2, a distinctive security literature did not become established until after 1945.⁹¹ Even in the period from 1945 to the modern day, security has continually evolved in terms of how it is defined.

Dominance of realist thinking and a narrow view of national security before the 1990s
From an international relations theory perspective⁹² and as discussed in section 2.2, understanding of national security has been dominated by realist thinking since the 1648 Treaty of Westphalia, which is largely accepted as the defining article of the modern nation state.⁹³ Although not resulting in one

⁸⁷ Verstein (2017).

⁸⁸ Hall & Soskice (2001).

⁸⁹ Hall & Soskice (2001).

⁹⁰ Baldwin (1997).

⁹¹ Buzan & Hansen (2009).

⁹² See sections 2.1. and 2.2. for more explanation of the core elements of realism.

⁹³ Singh & Nunes (2016).

homogenous definition of security, realist thinkers have tended to place a great deal of importance on the territorial integrity of the state and the physical safety of its people.⁹⁴ This is reminiscent of the realist thinking of Machiavelli and Hobbes, and is apparent in academic and contemporary thinking in the mid-20th century.⁹⁵ The offensive realist Hertz writes in 1950 of security as absence of fear of being ‘attacked, subjected, dominated or annihilated by other groups and individuals.’⁹⁶ Waltz gives a slightly broader statement when he refers to insecurity as ‘the uncertainty of each about the other's future intentions and actions.’⁹⁷ Though conflict is not explicitly mentioned, Waltz is referring to one state’s concern of another. Lippman argues that national security is achieved if a country does not compromise on its core values, either by being victorious in war or by avoiding war altogether.⁹⁸

The realist perspective and understanding of security was particularly prevalent throughout the late 1930s to the 1970s, when a rather militaristic view of security prevailed, emphasising the role of the state and specifically referring to ‘national’ security (as opposed to security more broadly). Historically, this understanding coincided with the end of WW2 and the beginning of the Cold War – a period where competition between the United States (US) and Soviet Union revolved around the belief that military might was the solution to achieving security.⁹⁹ Relatedly, the concept and pursuit of deterrence as a strategy assumed a prominent position in both academic and security policy discourse, with a comparatively smaller focus on the (perceived) threats that each great power in the Cold War represented to the other.¹⁰⁰

The devastation of WW2 is likely to have influenced the way national security was analysed because contemporary thinkers were writing just after unprecedented military conflict between powerful nation states.¹⁰¹ International conflict remained on the global agenda after WW2 with the Cold War, as the US and Soviet Union competed against one another by building nuclear weapons and strengthening their armies. Nuclear weapons were now a point of contention for theorists to argue over, and the period represented an analytical shift towards answering the question, ‘how to use a particular set of weapons’.¹⁰² Naturally, this encouraged discussions around security to be military and conflictual in nature. Furthermore, the US and Soviet Union were locked in a continual strategic battle of using their physical weapons as political weapons against one another, paving the way for seminal literature and policy discourse on deterrence, game theory, coercion and containment, amongst others.¹⁰³ However, the

⁹⁴ Walt (2010).

⁹⁵ Crawford (1991).

⁹⁶ Herz (1950, 157).

⁹⁷ Waltz (2010, 105).

⁹⁸ Lippmann (1943).

⁹⁹ Lin (2011).

¹⁰⁰ Decades of scholarship on (nuclear) deterrence include significant contributions from RAND experts. Relevant literature includes, for example: George and Smoke (1974); Beaufre (1965); Schelling (1980); Schelling (2008); Freedman (2004); Mazarr (2018).

¹⁰¹ Baldwin (1995, 120).

¹⁰² Baldwin (1995, 123).

¹⁰³ Walt (1991).

political climate created by the nuclear threat prevented other important issues, such as those of development and poverty, from coming onto the security agenda.¹⁰⁴ Following the Cold War, policy dialogue emphasised that underdevelopment leads to wants and wants lead to fear; development is needed for security to be achieved.¹⁰⁵

Ullman argues that the Cold War restricted interpretations of security to a militaristic manner, because the Soviet Union was an ever-present powerful state that would willingly use force against its enemies.¹⁰⁶ It was thus at the forefront of people's minds, making non-traditional aspects of security appear as somewhat less pressing.¹⁰⁷ Ullman stipulates that this overt focus on the military and the nuclear threat could lead to the neglect of 'other and perhaps even more harmful dangers.'¹⁰⁸ As Baldwin notes, despite this period being referred to as a 'golden age in security studies', several notable scholars of the time admit to an overt focus on the 'military aspects of national security at the expense of historical, psychological, cultural, organisational, and political contexts.'¹⁰⁹ Retrospectively, Singh and Nunes describe the militaristic and power-focused view of national security as very hegemonic and conflictual in its outlook.¹¹⁰ They, too, consider this view as resulting in a fairly narrow definition of security.¹¹¹

Redefining national security after 1990 in a new global order

The end of the Cold War marked a turning point in traditional military-dominated conceptions of security.¹¹² Global political thinking changed, creating a shift from a realist understanding of national security and its focus on expanding security, to encompass other previously neglected aspects.¹¹³

There are a multitude of possible reasons as to why this happened, some of which are discussed in this limited overview. Lin suggests the reasons for this movement lie initially with the fall of the Soviet Union and with the continuing rise of globalisation.¹¹⁴ With the Cold War drawing to a close, the Soviet Union left no comparable successor in terms of military threat, creating a climate for other issues to take a more prominent voice in the policy debate.¹¹⁵ There was now more to risk by engaging in conflict, and less need to do so, hence a full-scale inter-state conflict was becoming less likely. The decline of traditional

¹⁰⁴ Duffield (2001).

¹⁰⁵ Duffield (2001).

¹⁰⁶ Ullman (1983).

¹⁰⁷ Ullman (1983).

¹⁰⁸ Ullman (1983, 129).

¹⁰⁹ Baldwin (1995, 123).

¹¹⁰ Singh & Nunes (2016).

¹¹¹ Singh & Nunes (2016).

¹¹² Baldwin (1997); Burgess (2007).

¹¹³ Ullman (1983).

¹¹⁴ Lin (2011).

¹¹⁵ Baldwin (1995), Fukuyama (1992).

inter-state conflict meant that many doubts were raised about the realist assumption of the dominance of military security, resulting in greater interest in less militaristic views of national security.¹¹⁶

Additionally, the phenomenon of globalisation meant that countries were becoming increasingly interdependent on one another, making the consequences of state actions increasingly complex, and altering the manner in which countries interacted with each other. This interaction and interdependency between states highlighted the need to consider national security in relation to wider international developments. Indeed, Mathews claims that from the 1970s onwards even the US started to realise it was no longer the independent powerhouse it once was, and was now subject to the consequences of economic policy in many other countries.¹¹⁷

Another consequence of globalisation and related phenomena – such as Europeanisation¹¹⁸ and transnationalism¹¹⁹ – has been a perceived erosion of the nation-state. The reduced sovereignty and authority of the state in matters of national security has been an increasingly prominent feature of academic debates,¹²⁰ with this perceived decline commonly associated with an evolving role of sovereign governments as security providers in a context of an increasingly globalised and complex security environment.¹²¹ Alternative understandings of the nation-state's power and influence emerged that examined the relative positions of states versus market powers in conditions of globalisation.¹²² CPE theorists such as Susan Strange viewed the power of the nation-state as being eroded by transnational [economic] actors and phenomena, and were later supported by those such as Cutler who suggested that the nation-state no longer holds the exclusive claim to authority, as had previously been assumed.¹²³ In this regard, politics is no longer the exclusive remit of state actors; power is exercised by market forces; and authority is legitimately exercised by non-state actors.¹²⁴ In this context, the ability of sovereign nation-states to manage and provide security is increasingly challenged.¹²⁵ The role of private-sector actors in national security provision is reflected in contemporary debates on corporate social responsibility (CSR). Ridley has proposed that CSR should be expanded to encompass critical infrastructure resilience,

¹¹⁶ Buzan (1997).

¹¹⁷ Mathews (1989).

¹¹⁸ 'Europeanisation' is a term used within the study of European integration, and can be broadly defined as the influence of European integration on national political systems, structures and identities, or 'domestic change caused by European integration'. See: Vink (2005).

¹¹⁹ Transnationalism (also known as transnationalisation) is used to describe interactions that take place across national borders (both in terms of material ties and symbolic flows, such as cultural norms or values). Viewed as a consequence of globalisation, transnationalism can be described as 'a process of growing cross-border interaction, cooperation and transaction by state actors, economic actors, and civil society actors'. See: Altwicker (2018).

¹²⁰ Mol (2016).

¹²¹ Fjäder (2016).

¹²² Mol (2016).

¹²³ Cutler (2001).

¹²⁴ Strange (1970).

¹²⁵ Fjäder (2014).

suggesting that the social responsibility of private actors (such as telecoms or transport providers) should be included within national security frameworks.¹²⁶

The 1990s saw the emergence of the concept of ‘nodal governance’, a theoretical framework that challenges the historical view of the nation-state as the primary institution responsible for national security. It instead understands security governance as ‘beyond the nation-state’, involving a diverse, non-monopolistic network of public and private entities or ‘nodes’.¹²⁷ Here, links can be drawn with the Critical Theory understanding of the ‘plurilateral’ structure of the globalised world order, as discussed in Section 2.2 of this report.¹²⁸ In the context of a reduced role of the state, the growing plurality of political actors no longer view the nation-state as the primary actor through which their interests can be realised; at the same time, the nation-state has reduced or outsourced many of its social, economic and political responsibilities (for example to private actors).¹²⁹ Through the nodal governance paradigm, therefore, national security is produced in a non-monopolistic manner by a network of actors (nodes) from the state and markets that interact in formal and informal organisations, constituting a web.¹³⁰ When understood through the nodal governance paradigm, national security is produced not only – or even primarily – through the traditional top-down system of state authority, but also through a network of diverse public and private actors that interact within a horizontal governance mechanism.¹³¹

Other thinkers consider the rise of the economic and environmental agendas of the 1970s and 1980s, and concerns over identity and transnational crime in the 1990s, as further important reasons underpinning the move to redefine security, again highlighting the interconnectedness between national security and transnational events and developments.¹³² Ullman was one of the earlier and more prominent advocates of thinking about security more broadly. He argues a threat to national security could be viewed as something that threatens to ‘degrade the quality of life for the inhabitants of a state’, or that threatens to ‘narrow the range of policy choices available to the government of a state or to private, nongovernmental entities (persons, groups, corporations) within the state.’¹³³

A threat-based understanding of security as presented by Ullman is not new. Indeed, prior to Ullman, another critic of the traditionalist definition of security, Arnold Wolfers, labelled national security as an ambiguous symbol in the 1950s¹³⁴ and saw a more fitting description of security as the absence of threats. This broad definition may have different interpretations, but has since been used as a tool for broadening the concept of national security, since threats could capture traditional military threats as well as non-

¹²⁶ Ridley (2011).

¹²⁷ Quéro and Dupont (2019).

¹²⁸ Cerny (1995).

¹²⁹ Lindsey (2014) cited in Cerny and Pritchard (2017).

¹³⁰ Quero & Dupont (2017); Cerny and Pritchard (2017).

¹³¹ Quero & Dupont (2017).

¹³² Buzan et al. (1998).

¹³³ Ullman (1983, 133).

¹³⁴ Baldwin (1997).

military threats, such as environmental disasters or the structural power held by large transnational corporations (as highlighted by CPE theorists).¹³⁵

Introducing 'human security' to further broaden the understanding of national security

Many of the non-traditional security themes can be grouped into the term 'human security' – the idea that conceptions of national security should revolve around security of the individual – which deviates from the state-centric view.¹³⁶ These topics started to enter into the security agenda, marking a transition away from the traditionalist conception of national security as a military, conflictual and state-centric topic. Booth notes that people started to accept that the biggest threat to the well-being of individuals was not from a foreign army, but from 'economic collapse, political oppression, scarcity, overpopulation, ethnic rivalry, the destruction of nature, terrorism, crime and disease.'¹³⁷ Booth further referred to security as 'survival plus', implying that narrow definitions of security purely focused on survival in a conflict-and-competition ridden environment are too overtly concerned with basic survival from threats, when security should encompass aspects above and beyond purely existing. Beyond mere survival, the 'plus' element considers also well-being, more formally defined in the 1994 Human Development Report, which lists seven dimensions of human security: economic, health, personal, political, food, environmental and community.¹³⁸ In 2001, the Commission on Human Security was established, which maintains a view that human and national elements of security are separate but mutually dependent, with the Commission's definition of human security being the protection of 'human lives in ways that enhance human freedoms and human fulfilment.'¹³⁹

Various arguments are offered in academic and policy literature to justify the adoption of a broader view of national security. Poor economic conditions, such as mass unemployment and stunted growth, could mean military capabilities are under-resourced.¹⁴⁰ Thus, states have weaker defences and could be more vulnerable to foreign aggression.¹⁴¹ Also, a more human-security-focused interpretation of national security would see poor economic conditions leading to a lower standard of living, associated with job losses and decreased ability of people to provide for themselves.¹⁴² In environmental terms, national security could be threatened if wars are waged in competition for scarce resources, as also recognised by the realist thinkers. Finally, physical safety of the state could be under threat due to environmental conditions as seen, for example, by the risk of flooding in the Netherlands. As lives of inhabitants could be placed in danger, one could argue that this risk constitutes a threat to human security, even if this threat is not initiated by a foreign state or actor, as held by the traditional understanding of 'security'.¹⁴³

¹³⁵ Baldwin (1997).

¹³⁶ Liotta & Owen (2006).

¹³⁷ Booth (1991, 318).

¹³⁸ Anand & Sen (1994); Gómez & Gasper (2013).

¹³⁹ Commission on Human Security (2003, 4).

¹⁴⁰ Neu & Wolf (1994).

¹⁴¹ Møller (2000).

¹⁴² World Bank (2011); Commission on Human Security (2003, 73).

¹⁴³ Møller (2000).

Similar arguments can be made for the other factors as listed in the Human Development Report, such as extreme weather events and natural disasters.¹⁴⁴ For practical policy implementation, a wealth of literature is available on human security and safety, with risk management literature offering particularly valuable insights on risks that are understood to be the product of the probability and consequences of a hazardous event or phenomenon. Any detailed exploration of this body of literature is beyond the scope of this study.

Advocates of a broader approach to defining security see human security and national security as separate, but closely related, concepts. Anand and Sen note that even traditional concepts of security are ultimately concerned with human life, arguing that since the protection of human life also concerns security from external threats, national security should be thought of as a sub-set of human security.¹⁴⁵ In essence, a more traditional understanding of national security (as territorial and military security) is here still recognised as important, with other aspects highlighted by the ‘human security’ concept included alongside it. Weiss argues that human security is completely linked to the nation since ‘democratic states with the authority and the monopoly of force to sustain such norms’ are best placed to defend human rights and provide security for its people, in both a defence sense and a broader sense.¹⁴⁶

2.4. Different perceptions of national security result in differences in national risk assessment processes

In an effort to find an ‘objective’ definition of national security, one may forget that security can mean different things to different people and that it is not an absolute concept. Wolfers, for example, talks about security as a value that nations could gain more of and could lose, stipulating that perceptions of the chance of a future attack are always going to be subjective and speculative, and dependent on feeling and judgement.¹⁴⁷ Recent thinking has also probed deeper into this idea of security as a feeling.¹⁴⁸ Bruce Schneier argues that security is both a feeling and a reality and though these two facets can be related, they only rarely are.¹⁴⁹ He defines these two different interpretations by saying we feel secure ‘when we feel protected from harm, free from dangers, and safe from attack’ and we are secure in reality when we ‘actually are protected.’¹⁵⁰ Waever highlights this ambiguity, saying that it often depends on who is talking about security. In academia, the study of security tends to focus more on the survival of the state, whereas in daily conversations, the use of the term is more general, referring to the freedom from threat.¹⁵¹ In agreement, Muresan notes there is what can be considered a citizens’ perception of security and an

¹⁴⁴ See Burgess (2007) and Commission on Human Security (2003) for the rationale as to why these ‘wider’ more human dimensions of security are relevant to both traditional and more recent interpretations of security.

¹⁴⁵ Anand and Sen (1994).

¹⁴⁶ Weiss (2004, 138).

¹⁴⁷ Wolfers (1952).

¹⁴⁸ Interview with Krishna Taneja.

¹⁴⁹ Schneier (2006).

¹⁵⁰ Schneier (2006, 9) and Harries (2008).

¹⁵¹ Waever (1995).

authorities' perspective.¹⁵² Furthermore, this feeling of insecurity can manifest itself as a tangible threat; for example, if people feel insecure, they may distrust the government or even spark wider societal disorder, which could have ramifications for the security and stability of a region or a country as a whole.¹⁵³ The perceptions of security and the study of internal security are extensively explored in a wealth of academic literature within the field of psychology, as well as literature on policing, internal security and crime. We consider such an exploration beyond the scope of this study.

Finally, in the English language, further distinctions are drawn between the concepts of 'safety' and 'security', with the former referring to being protected against unintended threats, while the latter implies protection against *deliberate* threats. In Dutch, security and safety are both translated as '*veiligheid*'. As a result, '*ationale veiligheid*' in the Dutch context refers to both security and safety, and the '*ationale veiligheidsmonitor*' explicitly includes not just threats emanating from deliberate actions (which would fall directly under the English word 'security'), but also safety hazards such as pandemics and flooding. Generally, the distinction in the English language draws out the meaning of 'security' as being protected against deliberate threats, with 'safety' implying unintended threats such as natural disasters. Etymologically speaking, 'security' comes from *se* (without) *cura* (care), while 'safety' has its roots in *salvus*, meaning 'healthy'.

While in some cases distinctions can be made between security-related risks and safety-related risks – as determined by the actor(s) responsible for addressing the threat – such distinctions are increasingly more difficult to make in a globalised and digitalised environment, in which threats are interconnected and interdependent.¹⁵⁴ To illustrate, the potential impact of a nuclear powerplant being attacked by a terrorist group could be identical to the impact of a safety incident or a natural disaster affecting such a powerplant. To draw out these differences more clearly, a 2010 study by Institut Télécom, Télécom ParisTech established the SEMA framework,¹⁵⁵ which can be used to distinguish between safety and security.¹⁵⁶ The categorisation is based on where the threat originated (System or Environment), what it is targeting (again, System or Environment), and what the intent is (Malicious or Accidental).

2.5.A 'broader' definition of national security to include the economic dimension

As shown in previous sections, the concept of 'national security' has evolved over time, influenced by both theoretical viewpoints – such as realism and liberalism – and historical events and developments. Today, policy documents and academic writing either define national security in relatively 'narrow' terms, focusing primarily on the security of the state and its ability to protect its territory and sovereignty; or

¹⁵² Muresan (1998).

¹⁵³ Interview with Krishna Taneja.

¹⁵⁴ De Spiegeleire et al. (2012).

¹⁵⁵ When examining safety and security threats, SEMA distinguishes between System vs Environment (S-E) and Malicious vs Accidental (M-A). See: Piètre-Cambacédès & Chaudet (2010).

¹⁵⁶ Piètre-Cambacédès & Chaudet (2010).

adopt a ‘wider’ definition extending beyond the state to take into account developments in the international system, as well as other factors such as economic, environmental and social well-being.

Rothschild provides a useful summary of the expanded concept of ‘national security’.¹⁵⁷ She categorises the recent extension of security in four ways:¹⁵⁸

1. Firstly, security has been extended from nations to the security of individuals.
2. Secondly, it also accounts for the international system.
3. Thirdly, it has been extended to look beyond military aspects of security to previously neglected dimensions of security, including political, economic, social, environmental or ‘human’ security aspects.
4. Finally, political responsibility for dealing with security matters now includes actors beyond national governments, such as international organisations, local government, the public, the media and the private sector.¹⁵⁹

In her article *What is Security*, Rothschild cites the following factors as some of the core themes that the policy and academic literature considers important when defining national security: stability; safety; protection; and freedom from fear, threat and conflict.¹⁶⁰

Buzan, Waever and de Wilde are prominent advocates for widening the definition of security, arguing that security should be analysed according to five key themes: military (as in the traditional concept of national security), political, economic, environmental and societal.¹⁶¹ This widening school of thought has since been termed the ‘Copenhagen School’ which, as discussed in section 2.2, centres on the analysis of security in both the traditional (military) sense, as well as taking into account non-military threats and vulnerabilities.¹⁶² Representatives of this school of thought argue that this was necessary due to a ‘dissatisfaction with the intense narrowing of the field of security studies imposed by the military and nuclear obsessions of the Cold War.’¹⁶³ The ‘Copenhagen school’ defines security to be the absence of existential threat, and since a threat can be anything, the word security, in part, loses its significance.¹⁶⁴ It entirely depends on the context in which it is being used; hence ‘security’ may be viewed as a speech act that is pointing towards some indicated threat, as opposed to a single, restrictive definition.¹⁶⁵

As with any academic debate, there has been a counter-argument to the call to ‘widen’ the scope of national security. One of the main lines of criticism is that if the concept is broadened too much, then it is at risk of losing its value as a tool of policy and political analysis.¹⁶⁶ Waltz views this as national security

¹⁵⁷ Rothschild (1995).

¹⁵⁸ Rothschild (1995).

¹⁵⁹ Rothschild (1995).

¹⁶⁰ Rothschild (1995).

¹⁶¹ Buzan et al. (1998).

¹⁶² McSweeney (1996).

¹⁶³ Buzan et al. (1998).

¹⁶⁴ Consultation with Prof Jaap de Wilde.

¹⁶⁵ Consultation with Prof Jaap de Wilde.

¹⁶⁶ Sachs (2003).

losing its ‘intellectual coherence’, which could make solving policy problems much more difficult as a result.¹⁶⁷ Furthermore, if security encompasses too many things, then it cannot be looked at in terms of a trade-off with other, separate concepts.¹⁶⁸ Schneier argues that, when considering real-life situations, it is possible to see governments making national security decisions in terms of trade-offs. He uses the example of a possible terrorist attack on a bridge; the government could close the bridge to prevent fatalities, or keep it open. Responsible authorities will weigh the costs of closing the bridge – for instance, the costs of increased travel time or the potential anxiety it may cause amongst the public.¹⁶⁹ In other words, responsible actors would consider the risks and compare them to other costs and benefits. This becomes more difficult if more and more issues are securitised.

Ullman, on the other hand, stipulates that the most profound trade-off of all is how much liberty one would be willing to sacrifice in exchange for greater security.¹⁷⁰ Booth goes as far as to say that ‘security and emancipation are two sides of the same coin.’¹⁷¹ And as Baldwin states: ‘since security competes with other goals for scarce resources, it must be distinguishable from, yet comparable with, such goals.’¹⁷² It seems, therefore, that there is some agreement on how ‘security’ is perceived and compared to other ‘goods’ in practical policymaking, even though the definition of ‘security’ (or even the definition of the other ‘goods’) remains ambiguous or contentious. While, on a theoretical level, the argument continues, both government and academia alike have increasingly begun to incorporate more non-traditional aspects of security into their conceptions of national security.¹⁷³

2.6. A trend towards considering economic and welfare aspects in national strategic documents

To complement the review of academic literature, the study team also conducted a brief review of the recent national strategic documents of selected countries, including: Australia, Canada, China, Denmark, France, Germany, Russia, Singapore, Sweden, the UK and the US. These countries represent a non-systematic selection of example countries in Europe and global powers.¹⁷⁴ In Annex B, we include a full summary of this review, with countries presented in alphabetical order. Similar to the academic landscape, it appears there is no unifying definition of ‘national security’ that would be recognised by a significant number of states. Indeed, very few countries have an explicit definition of ‘national security’ in the first

¹⁶⁷ Walt (1991, 213).

¹⁶⁸ Sachs (2003).

¹⁶⁹ Schneier (2006, 17).

¹⁷⁰ Ullman (1983).

¹⁷¹ Booth (1991, 319).

¹⁷² Baldwin (1997, 24).

¹⁷³ Hameiri & Jones (2013).

¹⁷⁴ These countries were selected on the basis of (a) ensuring geographic representation across European and global powers, and (b) the availability of strategic documents.

place: a 2013 study found that over 50 per cent of 20 European countries surveyed do not explicitly define national security within national law.¹⁷⁵

The concept of national security broadly involves resilience against any threat to the sovereignty, autonomy, internal stability or territory of the nation-state, encompassing both domestic and external threats. While there are some core elements of national security that nearly all countries include in their definitions (where these exist) – for example military security, sovereignty and security of citizens – there is a great variation in the ways in which national security is defined, conceptualised and operationalised in different jurisdictions. For the purposes of this overview, Table 2.1 summarises the core components of ‘national security’ definitions included in official government documents and national security strategies, where available.

Based on the stated security interests and priorities of each country, it appears that some countries hold an understanding of national security that is broader than the traditional, military or defence-centric approach (e.g. Sweden, Germany and the UK), while others retain a strong state-centric focus and an emphasis on protection against external and internal threats, using military and security-sector capabilities (e.g. Russia, China, France and the US). In this sense, Sweden, Germany and the UK are similar to the Netherlands, where risks are assessed against a broad set of five national security dimensions. Like the Netherlands, following 9/11 and in light of greater globalisation, digitalisation and a more multi-faceted nature of threats, several countries have adopted a risk-based assessment of national security threats, for example Australia, Canada, Sweden, Denmark and the UK. In their respective strategic documents, most countries examined here also show increasing awareness of the interconnectedness between internal and external dimensions of security.

¹⁷⁵ Jacobsen (2013).

Table 2.1. Brief summary of countries' understanding of national security

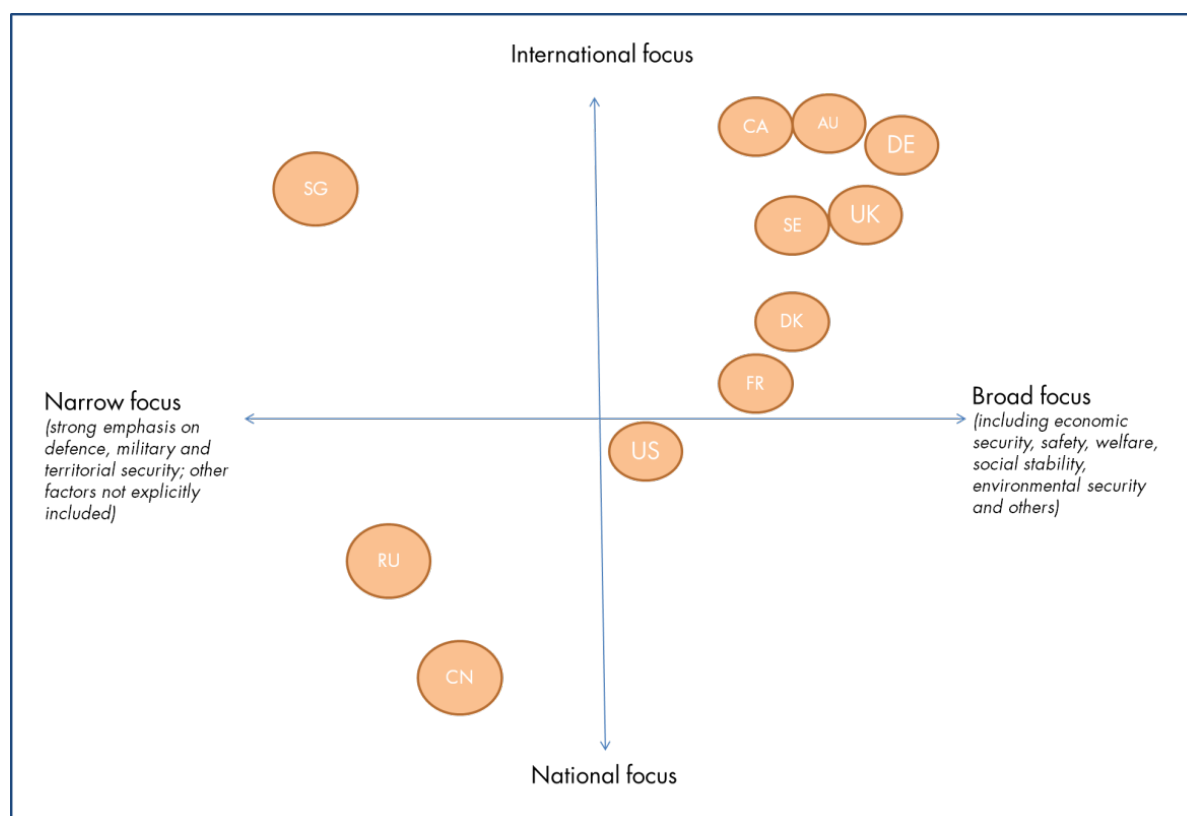
| Country | Key tenets of national security |
|------------------------|---|
| The Netherlands | National security is strongly connected with the wider international system and the EU in particular. Five national security interests are highlighted: territorial security, economic security, physical safety, ecological security and social and political stability. |
| Australia | National security involves protection and strengthening of sovereignty as well as ensuring wider security, safety and resilience of its population, infrastructure and institutions. |
| Canada | National security is tied to Canada's place in the world and its role within the international community, as well as its territorial integrity and the safety of its citizens and national infrastructure. |
| China | National security is inherently linked with internal political stability and, more specifically, the stability of the ruling party, while also considering the country's position within the international system and its resilience against external threats. |
| Denmark | National security can be defined as the resilience of the state and its citizens against external challenges to the country's safety and sovereignty. |
| France | National security entails the protection of the state and its citizens from all direct and indirect threats to their security, prosperity and influence, as well as the sustainment of the sovereignty and autonomy of the state in the context of the European system. |
| Germany | Germany's understanding of national security entails the protection of the country's citizens, sovereignty and territorial integrity and prosperity, as well as those of its allies and the security of the regional and international systems in Germany and its allies exist. |
| Russia | While global power projection and influence are defined as one of the country's long-term security interests, the main focus is on Russia's domestic security, with strong emphasis on national unity. |
| Singapore | National security is generally used with reference to the threat posed by transnational terrorism. Transnational terrorism was identified in 2004 as the single greatest risk to Singapore's security, and <i>Singapore's National Security Strategy</i> is designed almost exclusively to address this threat. |
| Sweden | National security encompasses resilience of the state, its citizens and infrastructure against both internal and external threats, and the upholding of the nation's position and influence as a sovereign actor within the international system. |
| United Kingdom | The UK understands its own national security to encompass its citizens (including its domestic and overseas territories, infrastructure and values and way of life), its international influence and its economic strength. |
| United States | National security is often considered to correspond to homeland security. It can be seen as the set of circumstances in which the safety, autonomy and prosperity of the US state, its citizens and institutions are upheld and protected from both internal and external threats, and in which the US is able to continue to wield its military power and influence in the international system. |

Source: Based on national security strategies and policy documentation, see Annex B.

While all countries examined recognise both internal and external threats as relevant to national security, the focus placed on these in the national security context appears to vary; some countries, like the Netherlands, place emphasis on the international dimension of national security with regards to both

external threats and the country's international influence (e.g. Canada, Australia, Germany, Sweden and the UK), while others are decidedly more inward-facing, with a primary focus on domestic stability (e.g. China, Russia). Moreover, some countries (including the Netherlands) explicitly include other-than-military aspects of security, for example economic security, environmental security and social stability; while others (e.g. the UK) also explicitly include a focus on values and influence as part of their contribution to national and international security. Figure 2.1 illustrates the variations in understandings of national security between the 11 comparator countries, in terms of both their breadth and national or international focus.¹⁷⁶ As illustrated below, the majority of countries examined in this study exhibited relatively broad, internationally focused understandings of national security, with a smaller number of countries focusing on narrower definitions and/or a more national-focused approach.

Figure 2.1. Mapping different countries' present-day understanding of national security on a two-dimensional scale



¹⁷⁶ This assessment was made by the study team on the basis of the information sourced from national strategies and security policy documents (see Annex B for more detail).

2.7. Critical infrastructures, sectors and processes that enable the functioning of society

Whether national security is conceptualised in the traditional sense¹⁷⁷ or in a broader sense¹⁷⁸, the internal stability and functioning of the society is also important as part of a discussion of what national security actually means.¹⁷⁹ Indeed, an uninterrupted functioning of a state's key political, economic, social, technological, legal and environmental (PESTLE) processes – such as financial transactions, secure data transfer between government departments, effective operation of emergency services, and many others – is critical to a state's ability to protect itself against internal and external threats. The state's ability to function is, in turn, influenced by several key factors such as the availability of energy sources – without which an economy cannot grow – or the resilience of its critical infrastructure, which includes, for example, the emergency services sector, the energy sector, financial services sector and communications sector, as well as the defence industrial base and the political and democratic spheres.¹⁸⁰ Furthermore, a strong economic foundation delivered through strategically important sectors and processes, underpinned by resilient critical infrastructure, facilitates a country's ability to cope with challenges, whether they are 'foreign or domestic in origin, intentional or accidental, and the consequences of human or natural forces.'¹⁸¹ Critical sectors and processes that enable economic activity and an overall functioning of society – such as, for example, securities trading, internet access, air traffic control, human rights and contact with emergency services – could all be seen as fundamentally acting as a sub-system of national security, as could more abstract processes, such as democratic processes and decision-making mechanisms.¹⁸² These factors are interdependent and interconnected, and could be understood as one complex system.¹⁸³

As shown in the findings of the EU FP7 *Reconceptualising Security* report, the economic and societal dimensions of security are consistently emphasised across policy documents of EU countries and their allies, with most recent documents emphasising the international nature of security, influenced by global developments and trends.¹⁸⁴ In some countries, greater emphasis is also being placed on the role of technology and protection of sensitive technologies and information as part of national security (e.g. US, France). This trend very much resonates with the current developments in the Netherlands, which is beginning to extend the focus on 'critical national infrastructures and processes' to industries whose capabilities and technological know-how may present critical information for Dutch national security (see Annex C). Indeed, in the Dutch context, NCTV's understanding of national security is near synonymous with economic security underpinned by a reliable functioning of critical processes.¹⁸⁵ Similarly, other

¹⁷⁷ For example Walt (2010), Waltz (2010).

¹⁷⁸ For example Ullman (1983), Buzan et al. (1998).

¹⁷⁹ De Spiegeleire et al. (2012).

¹⁸⁰ Ronis (2011).

¹⁸¹ Neu & Wolf (1994, xii).

¹⁸² Interview with Sheila Ronis.

¹⁸³ Interview with Sheila Ronis.

¹⁸⁴ De Spiegeleire et al. (2012).

¹⁸⁵ Interview with a Representative of NCTV.

countries highlight the importance of protecting critical infrastructure and sectors with an explicit aim to ensure national security and an uninterrupted functioning of economic and other societal activities.

2.8. Summary

As discussed in this chapter, the perspectives on security are numerous and diverse, but there is no consensus on a single definition. Understanding of national security has evolved over time, and it has been shaped and influenced by theoretical interpretations of international relations as well as historical events and trends. In broad terms, stability, safety, protection and freedom from fear, threat and conflict are considered as some of the core themes that the policy and academic literature examines when defining national security. Also, security can be defined in terms of the values that people hold, such as physical safety, economic welfare, autonomy and psychological well-being.

Prior to the Cold War, the traditional notion of security revolved around realist explanations of state actions and the nature of international conflict.¹⁸⁶ Since the end of the Cold War, there has been a growing literature looking to expand the scope of security to better account for globalisation and wider trends following the end of the bipolar struggle for power – as perceived by the realists. Many of these aspects focus less on the state and on conflict and more on the threats and risks that are faced by individual people – expanding to include areas such as crime, health and environmental concerns and economic security. As such, national security becomes tightly knit with preventing disruptive effects on society (e.g. economic performance or critical processes, such as democratic elections and others). These ideas are gradually making their way onto the security agenda in the policy domain, with international organisations and national governments alike incorporating them into their own concepts and strategies. In the context of the work of NCTV and for the purposes of this study, we will focus on those aspects of national security that relate to the protection of critical infrastructure, sectors and processes that are vital for the sustainable functioning of Dutch society (see section 1.2). The next chapter turns to an analysis of economically oriented factors that could have a disruptive effect on society due to the harm they could pose to critical processes that underpin the functioning of society.

¹⁸⁶ Burgess (2007).

3. Interconnections between national security and the economy

The previous chapter has shown that national security can be understood in a range of broad and narrow ways, with the economic and societal dimensions of national security gaining in prominence over time. In this chapter we examine the specific economy-related factors that influence national security, and propose the conceptual framework that underpins this analysis. This chapter first presents the conceptual framework through which the influence of these specific economic factors can be understood, before examining each of these economic factors in closer detail. Finally, it examines the broader global, regional and technological trends that, through the economic system, may have implications for national security. This chapter draws on a review of relevant academic and policy literature, and also highlights specific examples to illustrate how some of the risk vectors have manifested themselves in recent years.

3.1. Conceptualising national security through the lens of critical infrastructure, sectors and processes

The previous chapter illustrates that the scholarly debate about national security increasingly reflects a broader understanding of security; shifting from a definition exclusively based on the nation state to one that also includes a more human-centric definition. It is not possible, however, to comprehensively cover all of the different conceptualisations of national security highlighted in Chapter 2, and their interconnections with the wider economy, in this report. Therefore, this study adopts a focused approach on those economy-related factors that could have a disruptive effect on society due to their disruptive impact on critical infrastructure, sectors and processes. This focused approach is consistent with the way in which the thinking about national security in many modern states is operationalised (see Section 2.6). As noted in Chapter 1, the following definitions are used in this report:

- **Critical sectors** are sectors whose assets, systems and networks (whether physical or virtual) are considered so vital that their incapacitation or destruction would have a debilitating effect on national security, the functioning of the economy and society.¹⁸⁷
- **Critical infrastructure** is an asset or system that is essential for the maintenance of vital societal functions. The destruction of or damage or disruption to a critical infrastructure may have a significant negative impact for national or EU security and the well-being of its citizens.

¹⁸⁷ Adapted from U.S. Department of Homeland Security (2019).

- **Critical processes** are processes that could result in severe social disruption in the event of their failure or disruption.¹⁸⁸

Critical infrastructure, sectors and process are widely used terms in policy and legislation, both in the Netherlands and elsewhere.¹⁸⁹ As noted in Chapter 1, critical infrastructure has been a central policy focus in the Netherlands since 2003 and the definition has since been updated to encompass all critical processes that would cause severe societal disruption and a threat to national security if disturbed or interrupted. These processes are grouped in two categories – A and B. Category A consists of: national and distribution and transportation of electricity; production, national distribution and transportation of gas; oil supply; drinking water supply, flood defence and water management; and storage, production and processing of nuclear materials. Category B includes regional distribution of electricity and gas, military and police deployment, high-value transactions between banks, and internet connectivity, amongst others.¹⁹⁰

For illustration, Table 3.1 presents an overview of the definitions of critical sectors of five selected countries: Denmark, France, Sweden, UK, and US. These countries were selected non-systematically based on the public availability of information on national risk-assessment processes pertaining to critical infrastructure.

¹⁸⁸ European Commission (2019); National Coordinator for Security and Counterterrorism (2019a).

¹⁸⁹ Originally, the concept was introduced as part of the efforts to counter the impact related to the ICT millennium problems.

¹⁹⁰ National Coordinator for Security and Counterterrorism (2019a).

Table 3.1. Overview of critical sectors and processes as defined in selected countries

| Denmark | France | Sweden | UK | US |
|--|--|---|--|--|
| Critical societal functions | Sectors that contribute to the production and distribution of goods and services that are essential for the French State to exercise its authority, for the economy to function, for the continued defence of the nation or for the sake of national security | Sectors that facilitate vital societal functions | Assets, facilities, systems, networks or processes and the essential workers that operate them, the loss or compromise of which could result in major detrimental impact on the availability, integrity or delivery of essential services and/or significant impact on national security, national defence, or the functioning of the state | Sectors whose assets, systems, and networks, whether physical or virtual, are considered so vital to the US that their incapacitation or destruction would have a debilitating effect on security, national economic security, national public health or safety, or any combination thereof |
| <ul style="list-style-type: none"> • Defence, intelligence and security services • Energy • Exercise of authority • Finance • Fire and rescue services, police tasks, military assistance to civil authorities, etc. • Food • Health and social services • Information and communications technology • Transport • Water | <ul style="list-style-type: none"> • Communication, technologies and broadcasting • Civilian activities • Energy • Finance • Food • Health • Industry • Legal activities • Military activities • Transport • Space & research • Water management | <ul style="list-style-type: none"> • Energy supply • Financial services • Foodstuffs • Health, medical and care services • Information and communication • Municipal technical services (water supply, road maintenance etc.) • Public Administration • Protection, safety and security (e.g. military) • Social security • Trade & industry • Transport | <ul style="list-style-type: none"> • Chemicals • Civil Nuclear [power] • Communications • Defence • Emergency Services • Energy • Finance • Food • Government • Health • Space • Transport • Water | <ul style="list-style-type: none"> • Chemicals • Commercial Facilities • Communications • Critical Manufacturing • Dams • Defense Industrial Base • Emergency Services • Energy • Financial Services • Food and Agriculture • Government Facilities • Healthcare and Public Health • Information Technology • Nuclear Reactors, Materials, and Waste • Transportation Systems • Water and Wastewater Systems |

Source: RAND Europe analysis of national strategic documents of Denmark, France, Sweden, the UK and US.

The lists of critical sectors and processes presented in Table 3.1 are drawn from the national security strategic documents of the five countries.¹⁹¹ As shown in the table, there is a high level of similarity in the listed sectors and processes, indicating that certain sectors (such as energy, finance, food and transport, amongst others) play a critical role regardless of the size of the country or its economy. Of increasing importance is also the need to ensure protection and resilience against threats that apply to all sectors, as they are interdependent and failure in one could have cascading effects on another.¹⁹² For example, the failure of satellite navigation systems could have detrimental effects on the functioning of emergency services. Also, cyber resilience is recognised as an underpinning resilience-enabler for all sectors and functions, meriting specific attention in national risk management.¹⁹³

In contrast with the five countries summarised above, the NCTV has recently moved away from ‘critical sectors’ to a more narrow focus on ‘critical processes’ in the Netherlands, enabling a more targeted and resource-efficient approach since many processes that lie within ‘critical sectors’ should not necessarily be considered critical.¹⁹⁴ The NCTV has identified 26 critical processes, which are listed in Table 3.2. They are categorised on the basis of potential impact of a failure or disruption: disruption or failure of Category A-critical processes would have a more severe potential impact on national security than Category B-critical processes. This categorisation also supports decisions in the Netherlands as to where to develop capacities to increase resilience of critical infrastructure. By emphasising the functioning of critical processes, the analysis presented here also touches on a range of other elements of national security, including defence (via the functioning of the military and defence industrial sector); safety and security of citizens (via the functioning of the law enforcement processes, effective data protection systems, etc.) and economic security (via the functioning of banking systems, financial transactions, transport links, etc.).

The overviews of critical sectors and critical processes in Tables 3.1 and 3.2 illustrate that despite the broadening academic definition of national security (see Chapter 2), human-centric aspects are still underrepresented in governments’ approaches to protecting national security in the Netherlands and other comparator countries. Critical processes in the selected countries are mostly limited to the physical production and distribution of specific goods and services. However, recognising the broadening concept of security in academic circles, the conceptual framework outlined in section 3.2 may also include human rights aspects or democratic processes. If we see these as part of our set of dependent variables, it would not be hard to argue that economic factors (such as concentration of power in certain markets, foreign influence in ownership) would affect them, and as such be considered as critical processes.

¹⁹¹ U.S. Department of Homeland Security (2019); French General Secretariat for Defence and National Security (2017); Centre for the Protection of National Infrastructure (2019); Danish Emergency Management Agency (2013); Swedish Civil Contingencies Agency (2014).

¹⁹² U.S. White House (2017).

¹⁹³ U.S. Department of Homeland Security (2019).

¹⁹⁴ National Coordinator for Security and Counterterrorism (2019b).

Table 3.2. Critical processes in the Netherlands

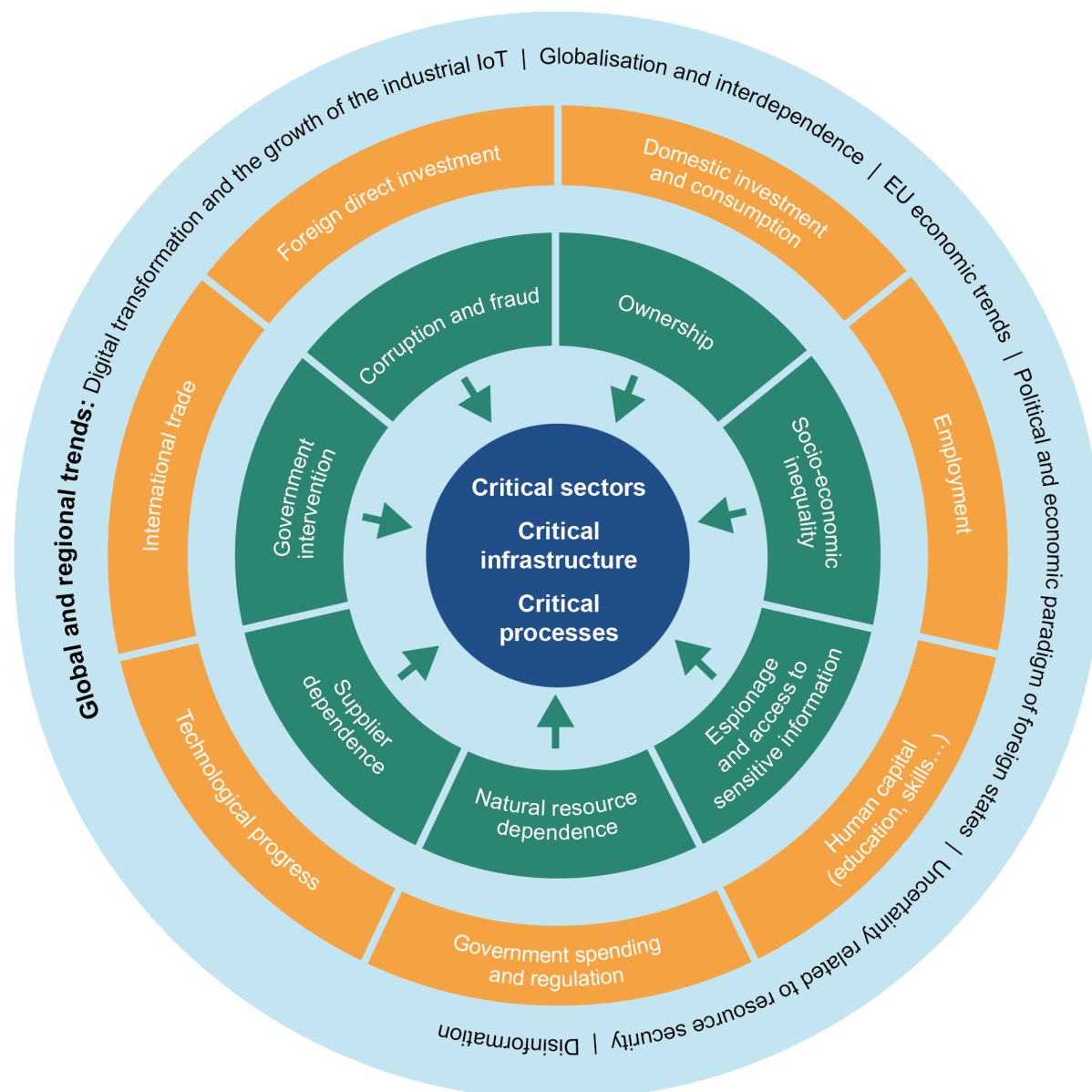
| Category | Critical processes | Critical sector |
|----------|--|-------------------------|
| A | National transport and distribution of electricity | Energy |
| B | Regional distribution of electricity | Energy |
| A | Gas production, national transport and distribution of gas | Energy |
| B | Regional distribution of gas | Energy |
| A | Oil supply | Energy |
| B | Internet and data services | ICT/ Telecom |
| B | Internet access and data traffic | ICT/ Telecom |
| B | Voice services and text messaging | ICT/ Telecom |
| B | Geolocation and time information by GPS | ICT/ Telecom |
| A | Drinking water supply | Drinking water |
| A | Flood defences and water management | Water |
| B | Air traffic control | Transport |
| B | Vessel traffic service | Transport |
| B | Large-scale production/processing and/or storage of chemicals and petrochemicals | Chemistry |
| A | Storage, production and processing of nuclear materials | Nuclear |
| B | Retail transactions | Financial |
| B | Consumer financial transactions | Financial |
| B | High-value transactions between banks | Financial |
| B | Securities trading | Financial |
| B | Communication with and between emergency services through the 112 emergency number and C2000 | Public Order and Safety |
| B | Police deployment | Public Order and Safety |
| B | Personal and organisational record databases | Digital Government |
| B | Interconnectivity between record databases | Digital Government |
| B | Electronic messaging and information disclosure to citizens | Digital Government |
| B | Identification of citizens and organisations | Digital Government |
| B | Military deployment | Defence |

Source: National Coordinator for Security and Counterterrorism (2019a).

3.2. A conceptual framework linking economic factors with potential threats to national security

To conceptualise the relationships between economic factors and the functioning of society, we propose a concept of ‘risk vectors’ that can be understood as avenues through which national security risks in relation to critical infrastructure, sectors and processes can be manifested. Underpinned by macroeconomic variables and economic developments, the risk vectors stem from the economic activity, but involve the potential presence of *malicious intent* behind such activity. If the malicious intent is or becomes present, the *risk* becomes a *threat* to national security. Such malicious intent can be interpreted in a traditional sense as actors willingly and knowingly afflicting harm on society for a particular purpose. This malicious intent may also be interpreted in line with contemporary (critical) thinking towards actors pursuing private interests at the expense of the public interest. Based on this conceptualisation, we propose an overarching analytical framework capturing economic factors, risk vectors and critical infrastructure, sectors and processes (see Figure 3.1), before examining each individual risk vector in greater detail in the following section.

Figure 3.1. Proposed analytical framework of risk vectors through which the economy can affect critical infrastructure, sectors and processes




Source: RAND Europe Analysis.

This framework is conceptual in focus and aims to remain context-agnostic. The degree to which each risk may manifest itself in any given country will naturally depend on the type of governance structure (e.g. democracy or authoritarian regime), the level of government expenditure in public sectors and their regulations, the degree of economic openness (e.g. restrictions placed on trade, capital flows, migration) and other unique characteristics of the state in question. Where relevant, we highlight some of these differences in the ensuing analysis. However, a proper comparative analysis of risk exposure of different types of states to the risk vectors is beyond the scope of this study.

The macroeconomic variables examined in terms of their relationships with ‘national security’ were selected from the results of two literature reviews. In the first instance, the study team reviewed relevant academic textbooks on the principles underpinning macroeconomic theory, economic growth models and international economics to draw up a long-list of potentially relevant macroeconomic variables for further

exploration.¹⁹⁵ In the next step, the study team conducted a focused literature review of academic and grey literature documenting economy-related risks to national security (in the broad sense), and drew up a separate list of macroeconomic variables that are mentioned in this context. The final list of macroeconomic variables and concepts was then consolidated by the study team, drawing on these two separate lists. The final list of variables is provided in Box 3

Box 3. Macroeconomic variables



Domestic investment and consumption: investment refers to the acquisition of assets (financial or real productive assets) by domestic actors (e.g. individuals, companies); consumption refers to the final use of goods and services by economic agents to satisfy their needs (as opposed to providing for future production).

Employment refers to the number of people in an economy who provide services for pay under a contract, as well as the self-employed.

Foreign direct investment refers to the acquisition by residents (individuals or companies) of a country of real assets abroad.

Global economic trends refer to the long-term movements of macroeconomic variables worldwide.

Government spending and regulation: government spending refers to spending by government at any level, including, for example, spending on real goods and services, employment in administration, education, transfer payments (e.g. to pensioners, unemployed), spending on subsidies and grants to industry, and debt interest payments. Regulation refers to government-imposed rules that individuals and firms are obliged to follow, and the procedures for deciding and enforcing such rules.

Human capital refers to the present discounted value of the additional productivity of people with skills and qualifications (over and above the product of unskilled labour). Human capital is acquired through education, training and on-the-job experience.

International trade refers to the exchange of goods or services between nations undertaken for mutual advantage.

Technological progress refers to the improvement in knowledge about techniques for production, resulting in more output to be obtained from unchanged inputs, the same output to be obtained from fewer inputs or new forms of output to be produced.

Once the list of macroeconomic variables was identified – based on the literature review that had focused on relationships between macroeconomic variables and national security – the study team met to map out the interconnections between the two in a two-day internal workshop. Given the complexity of the interrelationships and a large number of feedback loops, we found it impossible to create a clear causal map of the interconnections. Instead, on the basis of the evidence contained in the literature and gathered through expert interviews, we developed an intermediary set of *risk vectors* to enable us to communicate *how/in what ways* the links between ‘the economy’ and ‘national security’ manifest themselves. In other words, the risk vectors highlight the avenues through which the interaction between the components of ‘the economy’ and ‘national security’ takes place.

As shown in Figure 3.1, the risk vectors include: **ownership, espionage and access to sensitive information, natural resource dependence, supplier dependence, government intervention,**

¹⁹⁵ For example: Mankiw (2015), Krugman et al. (2009), and Jones et al. (1998)

corruption and fraud, and socio-economic inequality. These risk vectors are depicted in green, while the macroeconomic variables outlined above are depicted in orange. Each vector is explained in greater detail in the following sections.

In addition to the macroeconomic variables, we have identified several global and regional trends that also shape the risk vectors, and thus help to explain the interconnections between ‘national security’ and the ‘economy’. These trends are depicted in blue in Figure 3.1, and include:

- **Global and regional geostrategic and macroeconomic trends**, including globalisation and interdependence; EU economic trends; changes in the political and economic paradigm of foreign states and increasing uncertainty related to resource security.
- **Technological and information trends**, including digital transformation and the growth of the industrial Internet of Things (IoT), and an emerging distrust in facts and evidence, undermining critical processes such as democratic elections and media communication.

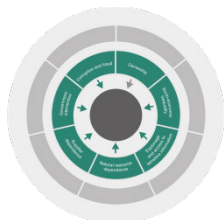
In simple terms, the analytical framework as presented in Figure 3.1 represents a system in which risk vectors interact with the national and global economy, and with wider global trends, with a resulting impact on national security (understood as critical infrastructure, sectors and processes). The risk vectors depicted in green thus represent endogenous factors (i.e. are part of the system under analysis), while the global trends are exogenous (i.e. not influenced by any of the other variables within the system). From a practical perspective, this means that a national government’s ability to influence, shape and respond to endogenous risk vectors (in green) will be far greater than its ability to influence global and regional trends and developments (i.e. exogenous factors).

Given the strategic-level nature of this study, a few caveats should be noted in relation to the analytical framework depicted in Figure 3.1:

- Firstly, the framework does not indicate the intensity or potential magnitude of impact (e.g. in terms of economic cost or disruption of societal functioning) if each risk was to materialise. Neither does it present any assessment of the likelihood of these risk vectors turning into threats to national security.
- The risk vectors are not exhaustive and their identification will inevitably depend on the definition of national security (and may vary by jurisdiction).
- The majority of the risk vectors have interconnections between numerous economic variables and there are likely to be multiple feedback loops between the economic variables and individual risk vectors. These are not depicted in the current analytical framework and would require a much more detailed exploration of each individual vector.
- Naturally, the impact of some risks materialising will be much greater than the impact of other risks – dependent on how they materialise and which critical infrastructure, sectors and processes are impacted, and how this impact cascades through other sectors.
- The individual risk vectors are also interconnected with each other. For example, dependence on a foreign supplier may be a result of, and be reinforced by, a skills and technology gap that exists

in the host country (see for example Box 5 highlighting the considerations in relation to Huawei's provision of 5G in the EU).

3.3. A closer look at risk vectors



Having outlined the core elements of the analytical framework for capturing the links between 'national security' and 'the economy', this section proceeds to illustrate how risk vectors may manifest themselves and potentially translate the macroeconomic activity into a security threat. While we have sought to separate the different risk vectors to enable a more thorough examination of each in turn, we recognise there is also a certain level of overlap in how the risks may manifest themselves and how the risk vectors interrelate. Where relevant, we highlight these interconnections.

Ownership



Foreign direct investment (FDI), which involves an investment into a domestic business or company to acquire full or partial ownership, can provide valuable resources, particularly if these are not obtainable domestically. The greater the level of FDI in an economy, the more interconnected the country can become with the investing countries and, in turn, the greater the risk of the FDI activity being used as a conduit for malicious action.¹⁹⁶ Thus, such investments can also entail risks in that foreign entities could gain influence and control over the operations of critical sectors (e.g. telecommunications companies, energy supply and management companies, etc.), which they could potentially use strategically or even misuse (e.g. to spread false information or disrupt energy supply).¹⁹⁷ Risks are particularly high if the involved critical sectors are closely related to national security, or the investments originate from actors with strong connections to other commercial actors or national governments that may have an interest in obtaining access to sensitive data or products.

In the case of state-led or state-owned companies acquiring ownership or influence in critical sectors of another nation (for example companies linked to the government in the People's Republic of China), the motivations could be geopolitical (e.g. seeking to gain leverage over strategic sectors to influence the broader strategic relationships with that nation, by creating economic and supplier dependence) rather than commercial.¹⁹⁸ In France, for example, FDI pertaining specifically to defence-related activities is monitored through a tailored review process to minimise these risks for a sector that is deemed critical for national security.¹⁹⁹

Similarly, as argued by the CPE authors cited in Chapter 2, disproportional ownership or influence by large (multinational) corporations in critical sectors may pose similar threats to national security. A

¹⁹⁶ Blanchard et al. (1999).

¹⁹⁷ Van Bergeijk et al. (2015).

¹⁹⁸ Bulten et al. (2017).

¹⁹⁹ French General Secretariat for Defence and National Security (2017); Bulten et al. (2017).

considerable share of critical infrastructure is owned by the private sector.²⁰⁰ Whilst economists identify various reasons to explain why actors in the private sector invest in the protection of critical infrastructure, – such as self-interest, altruism and societal norms²⁰¹ – there is an emerging consensus that protection of critical infrastructure is subject to market failure. Business interests may at times lead to sub-optimal outcomes for national security, for instance due to positive (e.g. ‘free rider’ behaviour²⁰²) or negative externalities (i.e. costs on society),²⁰³ lock-in or asymmetric information.²⁰⁴

Physical proximity as an enabler of potential malicious activity through ownership

While direct ownership of firms in a critical sector can present the most direct national security risk (if conducted by an actor who may have or develop malicious intent), ownership of companies and assets in physical proximity can also present risk to critical sectors and critical infrastructure.²⁰⁵ This is because physical proximity to critical infrastructure may facilitate an ‘easier access’ to malicious actors or opportunities for physical or virtual attack on the critical infrastructure itself. FDI into companies located in close proximity to nuclear power plants, military bases or defence industry production sites can present risks, if this investment is conducted by actors that could have intentions to obtain sensitive information about these sites or disrupt their functioning. Many national governments appear to recognise these risks; for example, in its FDI evaluation criteria the US government has included the need to consider whether the purchase or lease of real estate on US soil is in close proximity to government facilities or installations, due to the risk of impairing national security.²⁰⁶ As reported in the media, the UK has also identified the issue of proximity as a potential economic ‘trigger event’ that may give way to national security concerns; specifically, this involves ‘the [foreign] acquisition of more than 50 per cent of an asset that may give rise to national security risks due to their proximity to sensitive locations’.²⁰⁷ As shown in Box 4, the US has recently expanded its formal review process of foreign acquisitions of US businesses and assets – known as the Committee on Foreign Investment in the United States (CFIUS) review process – highlighting a growing need to specifically consider the risks of physical proximity.²⁰⁸

²⁰⁰ In the UK, estimates suggest 80 per cent of critical infrastructure is owned by the private sector (Warwick 2011).

²⁰¹ Nyborg and Rege (2003).

²⁰² ‘Free riding’ refers to when an actor that benefits from communal good, resources of services does not pay for them. See: Chung (2017)

²⁰³ Chung (2017).

²⁰⁴ ‘Lock-in’ refers to the physical constraints that mean that some services can only be provided by a certain company. For example, a utility company that builds a power station is typically locked into the vendor of the industrial control system for several decades. See: Anderson and Fuloria (2010).

²⁰⁵ UK Department for Business, Energy & Industrial Strategy (2017).

²⁰⁶ Jackson (2019).

²⁰⁷ Cleary Gottlieb (2018).

²⁰⁸ Interviews with RAND Europe.

Box 4. Example of foreign-transactions review process expanded to cover physical proximity risk

In 2018, the US expanded the scope of activities that are covered by the CFIUS review process, including an expanded review of real-estate acquisition by foreign actors. As a result, transactions under CFIUS's purview now include those that involve the purchase or lease by a foreign person of real estate that is in 'close proximity' to important transport hubs (e.g. airports or maritime ports), other sites of national security importance (such as military installations) or the property of the US Government that is sensitive for reasons related to national security. Physical proximity has long been part of CFIUS's risk analysis, but this provision formalises and expands the definition of 'covered transaction' to include acquisitions of property.²⁰⁹

Espionage and access to sensitive information



Related to the risks of gaining ownership and the risks related to supplier dependence (discussed below) is also the threat of espionage, where sensitive information and data can be obtained by unauthorised persons or organisations and used for malicious purposes. Through FDI, procurement of hardware and software or through employment in critical sectors foreign actors (companies or individuals) could obtain access to sensitive information on the design, operations and management of critical infrastructure, sectors and processes and feed this information back to actors who may have malicious intent or no right to access this information.²¹⁰ Specific concerns are raised particularly in relation to information and data-heavy critical sectors, such as the telecommunications sector, internet provision and government data-storage and transfer, where personal data, geographic information data and other sensitive information require heightened protection to avoid misuse. (See Box 5 for an example of current debates in relation to the 5G network provision by Huawei, a Chinese company.) The potential threat of espionage is also exacerbated due to dependence on certain suppliers (see section on Supplier dependence below) and ownership of assets by foreign actors, which may directly enable espionage to take place (see section on Ownership above). The threats of espionage do not necessarily exclusively emerge from traditional rival states. In the early 2000s the German government considered changing the operating system of its IT infrastructure from Windows to Linux because 'some versions of Windows contain backdoors designed to grant the U.S. National Security Agency access to users' data.'²¹¹

²⁰⁹ Christensen et al. (2018).

²¹⁰ Travalini (2009).

²¹¹ Perera (2001).

Box 5. Example of risks of accessing sensitive information and data and their potential misuse by foreign investors

A topical example in the EU and the Netherlands is the potential procurement of 5G equipment and networks from Chinese company Huawei, which is perceived to be at the forefront of 5G technologies.²¹² Although the allegation that Huawei is under the control of the Chinese government has not been confirmed – and has been fiercely disputed by the company²¹³ – Huawei is reported to have significant backing from the Chinese government.²¹⁴ Concerns are raised particularly in relation to the potential risk that sensitive information (such as information on citizens, organisations or national government systems) is provided to the Chinese state authorities if Huawei is contracted to provide the national 5G infrastructure.²¹⁵ More generally, state-backed or state supported companies may be given advantage due to state subsidies, tax breaks or other measures that may make them more competitive on the global market than companies that operate in a free market.²¹⁶ This may not only distort market competition but may undermine the ability of other (e.g. domestic) companies to compete against advantaged companies in the contest to provide critical functions – such as telecommunications, energy or others – and thus open the door to supplier dependence, which may create national security risks.²¹⁷ The close links between Huawei and the Chinese government were raised as early as 2005 by Medeiros et al. (2005: 218-21): ‘Huawei maintains deep ties with the Chinese military, which serves a multi-faceted role as an important customer, as well as Huawei’s political patron and research and development partner. Both the government and the military tout Huawei as a national champion, and the company is currently China’s largest, fastest-growing, and most impressive telecommunications equipment manufacturer’.²¹⁸

Further examples pertain to critical industrial and manufacturing sectors such as the defence industrial sector, whose ability to field defence equipment and support to the national armed forces when required is a critical process that underpins the functioning of society as a whole (see Box 1). The defence technological and industrial base (DTIB) has historically been a particular target of industrial espionage.²¹⁹ Foreign companies and governments may target defence and defence-related industries in order to acquire intellectual property that can be used to both undermine the international competitiveness of the targeted nation’s defence industry, and to inform the development of the targeting nation’s own capabilities for use against the target nation.²²⁰ Such industrial espionage may be conducted through the use of human intelligence, the interception of secure communications, the use of ‘smart’ drones to conduct intelligence and reconnaissance activities, or through targeted cyber attacks.²²¹

²¹² Fung (2019).

²¹³ BBC (2019b).

²¹⁴ Washington Post (2019).

²¹⁵ Stolton (2019).

²¹⁶ Bremmer (2009).

²¹⁷ Bremmer (2009).

²¹⁸ Medeiros et.al (2005)

²¹⁹ Federation of American Scientists (1995); United States National Counterintelligence and Security Center (2018).

²²⁰ Trident Response group (2019).

²²¹ Trident Response group (2019).

Box 6. Example of risk mitigation to prevent leaking of sensitive information and knowledge on the national defence industrial base

The Dutch Defence Industry Strategy of November 2018 presented a procurement strategy that entails procuring ‘the best product for the best price, with the greatest level of involvement of the Dutch business community’.²²² On the one hand the Strategy aims to strengthen the Netherlands’ defence industry, ensure that the Dutch armed forces are capable of defending national and allied forces, maintain its capability of taking direct independent action and make the country a credible partner to its international allies. On the other hand it acknowledges that Dutch suppliers may not always have the knowledge or capabilities to manufacture the necessary equipment, or deliver it within a given time frame and, hence, provides for potential procurement of certain products outside of the Netherlands. In these cases Dutch companies and knowledge institutes should be involved in the production to allow access to knowledge and capabilities. These measures are designed to ensure that management and knowledge of sensitive information is kept within the Dutch armed forces and defence companies, to as significant a degree as possible.

A first pertinent risk to critical infrastructure is transfer of intellectual property (IP) to malicious actors, which can facilitate the transfer of technologies to actors that may represent a national security risk.²²³ Critical sectors may be particularly vulnerable to IP theft where supply chains are heavily reliant on overseas suppliers, particularly those from potentially hostile states.²²⁴ IP can provide such actors with knowledge of critical technologies and thus enable them to develop their own equal or superior capabilities, gain a competitive advantage in the global market, or identify and target vulnerabilities in the state’s critical infrastructure and its protective systems. Traditionally, the field of nuclear science has been considered as particularly important to protect in this respect. Currently, an emerging area of concern is quantum science – a field that poses opportunities for applications in areas such as data processing and storage – and information and communications security, which can in turn enhance the security of national critical infrastructure.²²⁵ Nations such as Australia, Canada and the US are investing considerable resources in this field. However, IP theft may enable hostile actors to achieve ‘quantum advantage’, resulting in national security vulnerabilities,²²⁶ for example by making secure communications more vulnerable to interception, or on the other hand providing adversaries with superior encryption capabilities that protect their own communications from interception.²²⁷

Conversely, IP rights may also inhibit national security protection, when the owner of the intellectual property does not act in the national interest. Several authors argue that the risks of lack of access to intellectual property are actually greater for national security than the risks of IP theft.²²⁸ An example of such practice would be the patent protection of pharmaceutical drugs blocking generic competition. Some argue that pharmaceutical companies have developed defensive strategies to extend their monopolies by

²²² Netherlands Ministry of Defence and Ministry of Economic Affairs and Climate Policy (2018).

²²³ U.S. Government Accountability Office (2019).

²²⁴ Patrick (2019).

²²⁵ Kitchen (2019).

²²⁶ Kitchen (2019).

²²⁷ U.S. Government Accountability Office (2019).

²²⁸ For example Halbert (2016) and Brown-Keyder (2007).

filing overly broad patent claims and large numbers of follow-on or secondary patents.²²⁹ Hence, from this perspective open IP models (such as open access or open source) may be promoted to mitigate the risks of misusing IP rights.

Physical proximity as an enabler of potential malicious activity through espionage and access to sensitive information

An important enabler for successful espionage reported in the literature is physical proximity to a country's critical national infrastructure. Where critical infrastructure facilities are concentrated within a particular geographic area, the potential scale of impact if such critical facilities are compromised, is heightened yet further.²³⁰ For example, reportedly about 39 percent of the US banking and finance sector (by value) is concentrated in lower Manhattan, while over 31 percent of US naval shipbuilding and repair capacity is located in the Norfolk region in Virginia.²³¹ Hostile actors may choose to invest in companies in these regions in order to gain access to or compromise these sectors; the geographic concentration of the various companies or facilities means that the impact on the entire critical sector would be considerable. National power grids are often highly interdependent;²³² hostile actors may seek to locate themselves close to one facility and disrupt its functioning, which could have a cascading impact on national electricity supplies.²³³

Finally, concerns for critical sectors and processes and potential disclosure of sensitive information have also emerged in relation to foreign students who carry out research in strategically sensitive fields – such as nuclear science or artificial intelligence – and, once they have returned to their country of origin, could potentially allow strategic and economic knowledge to fall into the hands of foreign competitors.²³⁴ Specific concerns in the Dutch context have been raised in the past, for example in relation to Iranian students engaged in studies involving access to nuclear technology who have potentially applied this knowledge in nuclear research and development in Iran. In this context, the Dutch Ministry of Education asked Dutch universities to guarantee not to allow Iranian students access to such technology.²³⁵

Natural resource dependence



International trade can help ensure that a state obtains all the resources it needs. However, if critical infrastructure, sectors and processes depend on a foreign actor, dependencies emerge which may present national security risks. Overreliance on imports in critical sectors (e.g. energy imports or imports of resources necessary for production of defence materiel) may result in undue influence of a foreign nation on the critical sectors within the national economy.

²²⁹ Brennan et al. (2016).

²³⁰ Tal (2018).

²³¹ Parfomak (2008).

²³² Tal (2018).

²³³ Jackson (2019).

²³⁴ Van Esch et al. (2014).

²³⁵ The Hague Online (2008).

Many industrialised countries are not naturally rich in some raw materials (a prime example is European reliance on trade with the Middle East to ensure adequate oil supplies), meaning trade is vital to ensure an adequate supply of the raw materials required for society and the economy to continue functioning.²³⁶ Reliable trade partners are particularly important in the critical processes – such as water supply, food production or energy supply – upon which the functioning of the national economy depends on a daily basis. Dependency on natural resource supply from a single source or nation may create vulnerabilities in cases of instability, politically motivated field expropriations or supply cut-offs in individual producer states.²³⁷ In academic and policy literature, diversification and a sustainment of good diplomatic relationships between the suppliers and recipients is considered critical to mitigate risks related to a single supplier.²³⁸ Both measures are seen as important to ensure security of the supply of critical natural resources in case of diplomatic relationships with one supplier nation being jeopardised or the supply being hampered for another reason (such as a safety incident or a natural disaster).²³⁹ Maintaining a heterogeneous supplier base of natural resources can be vital to sustain the functioning of the economy.²⁴⁰ If there is reliance on a sole supplier nation, there emerges a risk that this state could use their position as a monopoly provider of a good as leverage to achieve political and security goals, by restricting supply, controlling prices or even tampering with goods.²⁴¹

As outlined in Chapter Two, many countries have broadened the scope of national security to encompass food and energy security. Energy distribution and transportation and food supply are considered by many nations to represent a vital process in terms of national security, including in the Netherlands (see Table 3.2).²⁴² Within a national security framework, energy security can be incorporated into the wider protection of critical national infrastructure, particularly with regards to physical infrastructure such as oil pipelines, nuclear facilities or power grids.²⁴³ The same would apply to the physical infrastructure for food supply and distribution. A high dependence on imports and other countries' infrastructure in this sector can create economic vulnerability.²⁴⁴

²³⁶ Constantinescu (2014).

²³⁷ Meierding (2013).

²³⁸ Gawdat (2006), Yergin (2006), Meierding (2013).

²³⁹ Gawdat (2006), Yergin (2006), Meierding (2013).

²⁴⁰ Constantinescu (2014).

²⁴¹ Geoeconomics (2019).

²⁴² Van Esch et al. (2014).

²⁴³ Flaherty & Filho (2013).

²⁴⁴ Van Bergeijk et al. (2015).

Supplier dependence



Through FDI into critical infrastructure and sectors, and through international trade (i.e. imports of products and services into the country), critical infrastructure, sectors and processes may become vulnerable to dependence on suppliers further down the supply chain (below the prime contractor who carries out the FDI transaction), who may be located outside of the country and may or may not be sufficiently reliable to ensure an uninterrupted functioning of the critical processes. The security of supply for critical products and services is particularly important in situations such as military deployment, emergency response or disaster relief, where unreliability of suppliers can jeopardize the effectiveness of the country's critical processes and thus threaten the functioning of the society as a whole.

Additional risks have arisen due to the increasing fragmentation and internationalisation of supply chains. As has been the trend in many industries, products and services underpinning critical infrastructure, sectors and processes have also seen an increasing internationalisation and fragmentation of supply chains, resulting in a system where multiple manufacturers with various specialities develop multiple technologies, and a system integrator integrates all the components and sub-systems into the overarching system. In doing so, manufacturers often draw on a complex, multi-tiered global supply chain over which they (or governments) ultimately only have limited visibility and control. The multiple vendors involved provide various access points for a potential hacker to gain control of a critical asset (e.g. control of the switches in the energy power plant), with each incremental supplier providing an additional opportunity to compromise the whole system (e.g. through malware, bugs or hacking).²⁴⁵ Parts and electronic components that have been counterfeited or otherwise compromised are a similar threat to both security and the safe operation of hardware in critical infrastructure and sectors.²⁴⁶ Additional risks may also emerge due to the so called 'vendor lock-in', when a purchasing entity (e.g. a company engaged in one of the critical processes) is 'locked' into a supplier contract due to the need to provide tailored software updates and maintenance; with alternative options not being available or representing a significant additional investment (e.g. selecting a different provider of the software may require a complete overhaul of the operating system).²⁴⁷

Supplier dependence may be reinforced by the presence of the following enablers, explained below:

- Presence of a skills gap in critical infrastructure, sectors and processes;
- Presence of a technology gap in critical infrastructure, sectors and processes; or
- Lack of competition among providers of critical processes.

Skills gap as an enabler for foreign entry and supplier dependence

Risks to critical national infrastructure, sectors and processes also arise if a country does not have sufficiently advanced human capital in employment to design, operate and maintain them. Research and

²⁴⁵ AEP (2017).

²⁴⁶ Ronis (2011).

²⁴⁷ Van Kooten et al. (2016).

development (R&D) intensive sectors – such as defence, nuclear propulsion, communications sectors, financial and banking services – require highly skilled workers, as do other critical sectors such as healthcare, transportation, air traffic control and others. Without the necessary human capital in place, a country could stop being able to sustain the critical sectors, might need to recruit talent from elsewhere or even rely on an external provider of these services (resulting in foreign supplier dependence), which could present further risks to national security.²⁴⁸ As shown in Box 7, skills gaps may emerge in general engineering and digital skills as well as in highly specialised skills, with recruitment difficulties foreseen across critical sectors (such as energy) as well as more general technical occupations. The level of employment within these sectors as well as the skills and qualifications of these employees are important for a sustainable functioning of critical sectors and processes, such that reliance on external providers with potentially malicious intentions can be minimised.

Within the EU, there is a general consensus that there is a relative shortage of people with cyber security skills, as well as science, technology, engineering and mathematics (STEM) skills more generally, and that this skills gap is widening.²⁴⁹ Cyber skills are needed to secure all types of critical infrastructure from cyber attacks originating from malicious actors. Some critical sectors such as the Dutch defence sector specifically advertise for skilled professionals in cyber and other STEM fields.²⁵⁰

Box 7. Example of risks related to skills gaps in relation to energy generation and supply

A recent report by private companies Airswith and Energy Jobline, drawing on a large survey of energy professionals, highlights a global shortage of engineering and digital skills in a range of energy sectors, including oil and gas, nuclear and, to some degree, also renewables.²⁵¹ The greatest skills gaps (i.e. situations where the demand for skills is not met by available supply) are anticipated by survey respondents to exist in electrical and instrumentation engineering (40% of respondents identifying a current and future skills gap), followed by mechanical (26%) and R&D engineers (14%). Across different age groups, the overall global energy sector was identified as also facing difficulties in recruiting and retaining professionals with adequate problem-solving, leadership and process-management skills.

Given the foundational nature of both technical and managerial skills highlighted, without appropriate measures (e.g. new recruitment, training, retention initiative and collaboration with the education sector), energy companies' ability to meet the increasing demand for energy supply and, in particular, for 'green' energy may be negatively affected in the near future.²⁵²

Technology gap as an enabler of foreign entry and supplier dependence

The presence of a technology gap is another risk vector connected to supplier dependence as well as to ownership and influence within critical infrastructure, sectors and processes, which reflects insufficient technological progress (e.g. due to insufficient domestic investment in technology). A technology gap refers to the inability of a nation's critical infrastructure, sectors and processes to pursue innovation and

²⁴⁸ Bar-El et al. (2018); UK Parliament (2018).

²⁴⁹ European Centre for the Development of Vocational Training (2016); UK Parliament (2018).

²⁵⁰ Ministerie van Defensie (2018).

²⁵¹ The Global Energy Talent Index (2019).

²⁵² The Global Energy Talent Index (2019).

implement state of the art technologies and processes, with the potential negative impact on their ability to deliver services. This may result in a risk that reliance for these services will be established with a foreign supplier. The protection of IP in science and technology is understood to be increasingly central to the security of critical infrastructure, sectors and processes.²⁵³ Just as skilled human capital is required to ensure sufficient protection of critical infrastructure, sectors and processes from threats, access to advanced technology is also important. Insufficient domestic investment in R&D and innovative technologies may result in the need to acquire foreign products and services (e.g. defence equipment, management systems for water and energy distribution – see Box 8).

Hand in hand with adoption of innovative technologies is the requirement to ensure that sufficiently skilled human capital is grown to exploit these. Therefore, as new technologies proliferate through all sectors – including critical sectors and infrastructure – talented people are vital to sustaining these sectors and enabling them to deliver the products and services to the expected quality levels. In the defence sector, for example, innovation and developing defence applications using autonomy, AI, data analytics and other technologies are critical to maintain military advantage.²⁵⁴ As highlighted above, cybersecurity is another example where sufficiently educated cyber professionals assume crucial roles in protecting critical infrastructure systems and networks from cyber attacks.²⁵⁵

Box 8. Example of risks related to technology gap

Technology gaps between the Netherlands and other actors are emerging in the domains of digital integration, news consumption, artificial intelligence (AI), big data and digitalisation, all of which can impact on the wider economy more generally and on the critical sectors specifically (e.g. telecommunications, financial and banking sector, etc.).²⁵⁶

Global digital integration has led to large amounts of data that are increasingly being protected by private parties, which complicates investigations and diminishes governmental control over the security of vital systems, and may complicate police investigation processes, border security screening, etc.²⁵⁷ As such, to secure cyberspace, governments may need to enlist or compel private companies to police the data and networks within their control as they are the ones who own and operate much of the internet and cyberspace.²⁵⁸

Lack of competition as an enabler for supplier dependence

A lack of competition in critical sectors may lead to over-reliance on a particular supplier or service provider, resulting in national security vulnerabilities. While industry consolidation is argued by some to be a useful means for achieving economies of scale,²⁵⁹ and in some cases (e.g. energy and water supply) there may be natural (state or regional) monopolies, monopolisation of the market by a limited number of

²⁵³ Masters & McBride (2018).

²⁵⁴ RAND Europe interview.

²⁵⁵ RAND Europe interview with Hugo Rosemont.

²⁵⁶ Bergema et al. (2017).

²⁵⁷ Glenster (2017).

²⁵⁸ Glenster (2017).

²⁵⁹ EY (2014).

actors can remove the incentives associated with competitive industry, potentially resulting in higher prices and limited innovation.²⁶⁰ This, in turn, could have implications for the accessibility and quality of critical infrastructure.

In many sectors, competition is understood to be necessary for quality, innovation and competitive pricing. In regulated sectors, instruments for encouraging innovation may range from facilitating competition to imposing price controls (see section on government regulation and Box 10 in particular). The potential consequences of this are illustrated by the recent experience of UK airports, where changes in ownership structure (including de-regulation of all but two airports) were accompanied with greater competition, innovation and ultimately greater customer choice.²⁶¹ Factors such as innovation are generally seen to be essential for nations in maintaining a competitive global market presence which, in certain technology areas such as quantum technology, 5G and defence-related technologies (e.g. stealth or nuclear weapons), can be central to national security.²⁶²

Government intervention



By setting the regulatory framework for critical infrastructure, sectors and processes, national governments can directly influence economic activities and determine their own levels of expenditure.

Government expenditure

The amount of government investment in its critical sectors will have important repercussions for national security. Spending on the design, operation and management of critical national infrastructure, sectors and processes in areas where government (not the private sector) is responsible for their functioning, will help protect against vulnerabilities. Expenditure on education, for instance, directly influences the human-capital stock of the nation and governments also have a significant role to play in R&D investment in technologies and innovation. Conversely, insufficient investment in critical sectors may directly impact on the society's ability to function effectively. Expenditure cuts in the health care budget, for instance, will undeniably affect a country's ability to protect and promote public health. A study on the impact on patient care of inadequate investment in the UK National Health Service (NHS) illustrated this.²⁶³ Cutbacks in government spending on critical infrastructure, sectors and processes can also have a direct impact in terms of reduced ability to respond to disasters and crises, as shown, for example in the reduced capacity of local and national governments to respond effectively to the Hurricane Mitch disaster in 1998, the second deadliest Atlantic hurricane in American history.²⁶⁴

Finally, specific concerns are raised in some literature in relation to insufficient government investment in cybersecurity measures to protect physical infrastructure at the local, regional and national levels, given

²⁶⁰ EY (2014).

²⁶¹ UK Regulators Network (UKRN) (2015).

²⁶² Kattan (2019).

²⁶³ Kraindler et al. (2019).

²⁶⁴ Comfort et al. (1999).

the threat posed by cybercrime and potential cyber attacks and the related scale of disruption that could result.²⁶⁵ In some situations, it will be critical to ensure a domestic industry survives – also for national security reasons – and national governments may decide to adopt support measures (e.g. rescue of the failing banking sector by providing a bailout package, as occurred after the global financial crisis of 2007–2008).²⁶⁶ Other times, it could be argued that natural market forces should allow an industry to go bankrupt because it is weak compared to stronger competition – so using taxpayer money to artificially prop up an industry could cause long-term slowdown in a state’s economic growth.²⁶⁷ Within the EU competition law, such state support is banned as it is considered to create unfair competition.²⁶⁸ The way in which national governments decide to deal with such situations when they occur in relation to critical sectors will inevitably shape the risks that will emerge: for example, the government may decide to contract the provision of critical services out to a foreign company (through FDI) and may thus increase the risks related to influence, control and misuse of sensitive information.²⁶⁹

Investment is also important for critical infrastructure to be maintained appropriately. As technology progresses, increasing investment is required to make the high-tech changes that are needed to progressively lower risk. If an airport is taken as an example, in order to maintain a level of resilience, investment is needed in new technologies such as scanners, electro-optic sensors and radio frequency identification.²⁷⁰ This enables the airport, as part of critical infrastructure, to help the functioning of society.

Economic policy

The economic policies pursued by governments – and the ability of governments to shape these policies – are likely to impact national security. Economic policies, such as setting trade tariffs or interest rates, can be used as instruments to control the amount of capital inflows into the economy, which has direct repercussions for FDI, the success and growth of domestic firms and the financial stability of households.²⁷¹ Import tariffs may be used as a tool to increase the competitiveness of domestic firms and support local growth.²⁷² At the same time, the decision to impose new import tariffs may undermine a nation’s national security by causing other countries to impose their own tariffs in retaliation, restricting the access of domestic companies to key export markets and reducing its capital inflows.²⁷³ High import tariffs may also increase the price of goods for the consumer, with consequences for the ability of

²⁶⁵ Talton & Tonar (2018).

²⁶⁶ UK Department for Business, Energy & Industrial Strategy (2017).

²⁶⁷ Neu & Wolf (1994).

²⁶⁸ European Commission (2019c).

²⁶⁹ Department for Business, Energy & Industrial Strategy (2017).

²⁷⁰ Subacchi et al. (2014).

²⁷¹ Nanto (2011).

²⁷² Chatzky (2019).

²⁷³ Gunnella and Quaglietti (2019), Amity et al. (2019).

households to provide for themselves.²⁷⁴ Box 9 provides one recent example of the use of tariffs by a national government citing security concerns.

The extent to which governments are able to determine their national economic policies can vary between nation-states. In the European context, European economic integration has had a significant impact on the national economic policies of Member States.²⁷⁵ European economic integration has transferred neoliberal market-making policymaking to the European level, reducing the ability of nation-states to determine their own economic policies.²⁷⁶ For example, economic decision-making in the Netherlands primarily occurs at the EU level, and is also strongly influenced by Germany as Europe's largest economic power.²⁷⁷ From a critical perspective, this economic integration has eroded the structural power of nation-states, making their national security interests vulnerable to the influence of regional and global market forces.²⁷⁸ The economic self-determination of nation-states may also be impacted by the governance frameworks of global multinational organisations such as the World Trade Organisation (WTO), which may act as both constraints or enablers of national economic policies, such as the use of tariffs.

Box 9. Example of government economic policy – steel tariffs

In 2018, the US Department of Commerce (DoC) released the findings of its investigation into the impact of imports of steel mill products on US national security. The report concluded that US steel imports represent a national security threat, with one cited reason being that imported goods reduce revenue to US firms and thus limit investments in research and development.²⁷⁹ In response to the investigation findings, President Trump adopted 25 per cent tariffs on imported steel from other nations, invoking national security concerns.²⁸⁰ This measure was one of a wider series of new import tariffs on steel and aluminium – with rates ranging between 10–50 per cent – on approximately \$283 billion of US imports.²⁸¹ Key US trading partners (notably China) responded with tariffs averaging 16 per cent on an estimated \$121 billion of US exports.²⁸²

Regulation

Effective regulation of critical infrastructure, sectors and processes is also important for national security. If the government does not appropriately regulate the economic activity, including in critical sectors and processes, market forces could produce outcomes with severe negative externalities that are detrimental to social optima and national security.²⁸³ Without government regulation, for example, energy providers or

²⁷⁴ Gunnella and Quaglietti (2019), Amiti et al. (2019).

²⁷⁵ van Apeldoorn and Horn (2018).

²⁷⁶ van Apeldoorn and Horn (2018).

²⁷⁷ Janning (2019).

²⁷⁸ May (2008), Revell (2006), van Apeldoorn and Horn (2018).

²⁷⁹ Hultberg (2018), BBC News (2019).

²⁸⁰ Hultberg (2018)

²⁸¹ Amiti et al. (2019).

²⁸² Amiti et al. (2019).

²⁸³ Kirshner (1998).

transport companies providing public transport would be incentivised to maximise profits, which could be at the expense of affordability and universal access.

In cases where private firms are left to maximise profits unchecked, and the market is not a perfectly competitive one, social inefficiencies may arise. Firms with market power may charge a profit-maximising price, which could result in the exclusion of certain consumers, or in the case of goods and services with high inelasticity (such as transport and energy), leaving consumers with no choice but to pay high prices, reducing consumer welfare.²⁸⁴ Given the unique characteristics of some critical sectors, a range of market failures may occur, requiring government regulation to ensure an effective provision of critical services to the public. The following market failures are most commonly identified in relation to critical sectors and processes:

- Some critical infrastructures and sectors constitute a type of public good, i.e. a good that is non-rivalrous and non-excludable, so anyone can and in many cases should have access to it. As such, costs to a single private provider would far outweigh the benefits to this provider.²⁸⁵ If these services are to be provided to the public (e.g. emergency services, policing or defence), the national or regional government will be required to provide them.
- Related to the presence of a public good, some critical infrastructures, sectors and processes may also be subject to the ‘tragedy of the commons’, which describes the tendency of people to overexploit resources if they are commonly available at no or limited charge.²⁸⁶
- Another form of market failure can originate from the presence of a (natural) monopoly in some critical infrastructures. In the case of a monopoly supplier (national or regional), the public is dependent on one supplier of a vital good or service. Without government regulation, the supplier could restrict supply, or put prices up artificially, meaning the public and other critical sectors would not have access to certain goods/services that are vital for the functioning of society.²⁸⁷ Evidence also shows that monopoly markets can be associated with the stifling of innovation.²⁸⁸
- Further specific concerns relate to potential negative externalities, such as insufficient security provisions resulting from high competition, or the presence of a ‘moral hazard’. For instance, in general software vendors operate in a competitive market where multiple players compete to release a high-quality, low-price service/product in a tight timeframe. With these drivers in place, some vendors may choose to cut costs by not addressing the security vulnerabilities of their product.²⁸⁹

²⁸⁴ Sloman et al. (2012).

²⁸⁵ Spiegel (2002); Sloman et al (2012).

²⁸⁶ Sloman et al (2012).

²⁸⁷ Sloman et al (2012).

²⁸⁸ UK Regulators Network (UKRN) (2015).

²⁸⁹ The Economist (2014); Silfversten et al (2018)

Moral hazard emerges as security vendors decide what risk to take by not putting all security features in place, knowing that the ultimate risk bearer will be the end user (whose system may be hacked).²⁹⁰

With these market failures present in many critical sectors, national governments have a range of options for regulating and encouraging innovation in critical sectors, depending on the presence/level of market failure in each individual sector. These options may range from promoting competition to price controls or stimulus packages. Box 10 highlights a specific example of regulating the energy sector.

It should also be noted that excessive regulation may impede necessary investment and competition in critical sectors. The 2017 US National Security Strategy explicitly identifies excessive infrastructure and environmental regulation for impeding energy trade and development of new infrastructure projects, and highlights the need to reduce regulation where possible, including in critical sectors such as finance.²⁹¹ At the same time, however, specific focus is placed on the CFIUS process of reviewing foreign transactions that could pose a national security threat to critical infrastructure, sectors and processes; this CFIUS process is intended to be strengthened and made mandatory for certain types of transactions.²⁹²

Box 10. Example of government regulation of critical sector – energy

Similar to many European countries, the UK government has introduced a number of regulatory measures to keep prices of energy supply low. These include, for example²⁹³: a) increasing competition to provide consumers with a greater choice of providers; b) enforcing measures to enable consumers to smoothly switch between energy providers to find lower prices; c) subsidising the energy companies directly; and d) regularly monitoring energy suppliers via the energy regulator Ofgem.

Corruption and fraud



Corruption and fraud as potential manifestations of regulatory failure and lack of enforcement can have a number of harmful effects on critical sectors and processes. The presence of corruption within critical processes and sectors can pose a substantial threat to national security by reducing transparency, distorting democratic processes and political outcomes, or by reducing the quality and accessibility of vital goods, services and physical infrastructure. The diversion of public funds, tax evasion and loss of revenue due to corruption can serve to reduce the government's overall ability to provide essential services and invest in critical infrastructure.²⁹⁴ In addition, any form of corruption in vital public sectors or processes is likely to erode public trust, to the detriment of the long-term functioning of society.

²⁹⁰ Silfversten et al (2018).

²⁹¹ The US White House (2017).

²⁹² U.S. White House (2017).

²⁹³ Gov.uk (2016).

²⁹⁴ Sohail & Cavill (2006).

A 2014 report by the OECD found that corruption can substantially reduce the quality of critical services and processes.²⁹⁵ Corruption in public procurement processes, meanwhile, can often result in infrastructure projects that are unsuitable, defective or dangerous.²⁹⁶ Corruption in procurement processes within vital sectors may lead to the misallocation of resources or increased costs which, in turn, can pose a threat to the quality and reliability of critical infrastructure.²⁹⁷ Misallocation of resources has been found to lead to insufficient maintenance of physical infrastructure (such as transport networks), which could result in catastrophic failure and thus pose a risk to public safety.²⁹⁸

The supply chains of many critical sectors (such as oil, gas and telecommunications) often transcend national borders, creating additional vulnerabilities (see section on supplier dependence) and opportunities for corruption.²⁹⁹ Such cases might involve bribery or collusion with potentially hostile states or state-sponsored actors. For example, in 2016 an investigation was launched into Monaco-based major oil company Unaoil, which was accused of paying millions of dollars' worth of bribes to secure government contracts in countries across Eurasia, Africa and the Middle East.³⁰⁰ Corrupt practices to secure overseas contracts in critical sectors may pose a serious threat to the security of the contracting nations by creating opportunities for hostile actors with malicious intent.

Corruption in critical sectors may also pose an opportunity for terrorist organisations, which could use activities such as bribery, money laundering and fraud in order to finance their activities and perpetrate attacks.³⁰¹ Corrupt practices such as bribery may, for example, be used by terrorist groups to gain access to insider information on vulnerabilities of critical assets or systems against which they can launch attacks.³⁰² Terrorist activities may also be enabled by corruption in the security sectors (such as border control or policing). One manifestation of this threat occurred in the event of the 2004 Moscow airport bombing, in which terrorists used bribery in order to smuggle explosives past the airport's security personnel.³⁰³

Corruption within democratic processes such as elections also poses a risk to the sustainable functioning of society. Corrupt economic activities (such as patronage or vote-buying)³⁰⁴ may ultimately change the course of democratic elections, potentially enabling foreign interference and creating national security vulnerabilities.³⁰⁵ Furthermore, electoral corruption risks undermining not only public trust (potentially

²⁹⁵ Soreide et al. (2014).

²⁹⁶ Sohail & Cavill (2006).

²⁹⁷ Fazekas & Toth (2018).

²⁹⁸ Kenny (2006).

²⁹⁹ Owens (2016).

³⁰⁰ Owens (2016).

³⁰¹ OECD (2017).

³⁰² OECD (2017).

³⁰³ OECD (2017).

³⁰⁴ UK Department for International Development (2015).

³⁰⁵ Boot & Bergmann (2019).

changing voting behaviour and reducing voter turnout),³⁰⁶ but also the wider democratic processes that underpin a functioning democratic society.

Socio-economic inequality



Socio-economic inequality can represent a threat to the security of a nation-state and may manifest through a number of different macroeconomic activities. Economic drivers of socio-economic inequality may include employment, international trade, and broader regional and global trends (such as EU economic trends and those of other economic areas). Within a national security framework, equality may be included as important for upholding critical national infrastructure, sectors and processes such as democratic institutions and decision-making processes.

When taking a broader view of national security that encompasses human security, socio-economic inequality poses a threat to national security by reducing living standards and the general well-being of lower income groups. For example, labour policies may be associated with job losses or reduced wages, whereas economic trends influenced by international trade or privatisation may inflate the cost of basic goods and services.³⁰⁷ Such economic conditions are likely to disproportionately affect less affluent groups and exacerbate inequality, reducing the ability of these groups to support themselves.³⁰⁸

When a narrower, state-centric definition of national security is employed, risks to national infrastructure, sectors and processes may arise if socio-economic inequality generates domestic instability or social unrest. Imbalanced development and associated social inequalities are likely to undermine public trust and social cohesion, and are therefore viewed by Stewart as an important cause of conflict or instability.³⁰⁹ For example, social economic disparities may undermine public trust in democratic institutions and impact participation in decision-making processes, and are commonly associated with domestic instability.³¹⁰ Stewart highlights that ‘horizontal inequalities’, such as economic disparities between different groups in society, are likely to undermine public trust in political institutions and foster resentments that can be used to mobilise support for movements that, if political address is not achieved, may result in social unrest and political instability.³¹¹ Inequality also makes resolving disputes more challenging, as well as potentially reducing the opportunity costs for certain groups in initiating or participating in a conflict.³¹² Political instability and conflict in turn discourages investment, with subsequent impact on a nation’s economic security.³¹³

³⁰⁶ Stockemer et al. (2013); De Vries & Solaz (2017).

³⁰⁷ World Bank (2011); Dabla-Norris et al. (2015).

³⁰⁸ World Bank (2011).

³⁰⁹ Stewart (2004).

³¹⁰ Stewart (2004).

³¹¹ Stewart (2004).

³¹² Dabla-Norris et al. (2015)

³¹³ Dabla-Norris et al. (2015)

Some scholars hold that socio-economic inequality can be produced through broader economic trends associated, for example, with European economic integration. This is a position held by some CPE theorists who view neoliberalism as an important driver of inequality and power asymmetries; the neoliberal leanings of European economic integration and its governance mechanisms are understood to produce unequal outcomes for different social groups across the region (for example in terms of labour rights, capital and wages).³¹⁴ Jessop argues that the ‘strategic selectivity’ of capitalist states, which seeks to advance the interests of certain fractional or class interests, is also present in the economic institutions at the EU level, which reproduces and reinforces structural inequality between socio-economic groups.³¹⁵ The neoliberal trajectory of European economic integration has also resulted in tensions between policies promoting market efficiencies and competition, and those that focus on social protection and equality.³¹⁶ While European economic integration has elevated neoliberal economic policymaking to the European level, authority over social and employment policies remains at the national level.³¹⁷ This resulting asymmetry of regulation between economic competitiveness and social cohesion has, in the view of some scholars, resulted in the latter being subordinated to the former, with social cohesion and equality becoming, in practice, a matter of individual responsibility.³¹⁸ Therefore, the subjugation of human-security-related policies to neoliberal economic policies can be viewed as undermining the national (human) security interests of nation-states. Box 11 highlights one example of the inclusion of socio-economic equality within a country’s national security framework.

Box 11. Example of socio-economic equality within a national security framework: Russia

The importance of socio-economic equality to national security is consistent with state understandings of their security, as set out in some states’ national security documentation. For example Russia’s 2015 National Security Strategy (NSS) emphasises addressing internal economic inequality as critical to ensuring its domestic stability.³¹⁹ Within Russia’s NSS, internal economic disparities between regions are associated with social tensions that threaten the country’s political stability and are therefore viewed as a considerable source of insecurity.³²⁰

3.4. A closer look at global and regional trends



A number of global and regional trends (as introduced in section 3.2) can be identified over the short- to medium-term that are likely to have implications for

d Horn (2018).

³¹⁶ Scharpf (1999).

³¹⁷ Scharpf (1999).

³¹⁸ Scharpf (1999).

³¹⁹ The national security ambition set out in the National Security Strategy include: raising Russian GDP to be amongst the highest in the world; increasing economic independence in key sectors such as agriculture; eliminating internal economic discrepancies between regions and individual citizens; and attracting greater foreign investment. See: Russian Federation (2015).

³²⁰ De Spiegeleire et al. (2012).

national security through the lens of the economic system. Not all of these are strictly economic trends, but most have an economic component. In the proposed conceptual framework we distinguish:

- **Global and regional geostrategic and macroeconomic trends**, including globalisation and interdependence; EU economic trends and integration; changes in the political and economic paradigm of foreign states and increasing uncertainty related to resource security.
- **Technological and information trends**, including digital transformation and the growth of the industrial Internet of Things (IoT), and potential concerns about information integrity and the undermining of critical processes, such as democratic elections and media communication.

Whether large or small, in today's interlinked world economy, most countries will be affected by global economic developments. For an open economy like the Netherlands, however, the impact of these developments could be considerable.³²¹ In terms of the country's geopolitical position, some authors argue that, due to for example dependency on Russian gas deals, Chinese investments and American geopolitical interests, Europe and the Netherlands are vulnerable to divide-and-rule politics, hybrid wars, sanctions and fines.³²² As a result of the globally interwoven production chains and the increasing economic and political power of emerging economies (e.g. Russia, China, Indonesia, India, Brazil and Mexico), politically motivated trade tensions and issues regarding access to natural resources and strategic transport routes are expected to increase.³²³ Chapter 4 highlights some of the specific risks pertaining to the Netherlands in greater detail.

In some cases, protectionist measures – such as industry regulations, tariffs on imports or restrictions on FDI – can be adopted to mitigate against wider security risks related to foreign actors' acquisition of critical infrastructure and sectors. However, protectionism can also have negative consequences. Although most of these instruments are internationally coordinated and regulated (e.g. through the EU or the WTO), placing tariffs on imports may lead to retaliation from trading partners, and restrictions on FDI may result in reduced investment overall, as well as potential damage to the image of an open economy that welcomes foreign investors. Such measures can make imports that are vital for the functioning of the economy far more expensive and harder to obtain, as well as lead to deteriorating diplomatic and commercial relationships, both of which can compromise national security.³²⁴

3.4.1. Global and regional geostrategic and macroeconomic trends

Globalisation and interdependence

As a result of increased trade and economic interdependencies, national infrastructure itself has become increasingly globalised.³²⁵ While the management of facilities and services of infrastructure remains essentially local, as do the end users, the underlying demands for infrastructure and the financial and

³²¹ Van Bergeijk et al. (2015).

³²² Hellendoorn (2016).

³²³ Wetenschappelijke Raad voor het Regeringsbeleid (WRR) (2017).

³²⁴ Baldwin (197).

³²⁵ Léautier & Lemer (2003).

development investment are increasingly global in scope, and supply chains, business relationships and production increasingly transcend national boundaries.³²⁶ Globalised infrastructure can bring benefits associated with increased competition, such as improved standards and performance, reduced costs, knowledge-sharing, and transfer of expertise, best practice and innovation.³²⁷ However, the sustained interconnectedness of nations in terms of trade and natural resources means that the security of critical infrastructure is contingent on public- and private-sector actors across the world, creating uncertainties and vulnerabilities for individual nations.³²⁸ Critical infrastructure in particular becomes vulnerable to the impact of events and activities that occur beyond national borders and over which national governments have minimal control; the resilience of critical infrastructure in this context is therefore highly dependent on effective information-sharing and good practice amongst key partners.³²⁹ Specific concerns for the Netherlands arise particularly in relation to the following trends: the shifts in the global financial-economic order, including the increase in China's influence – for example through the Asian Infrastructure Investment Bank and the Belt and Road Initiative – and the rise of US protectionism, as well as the emergence of new transnational networks, such as the 16+1 dialogue between China and certain central and eastern European nations.³³⁰

International economic trends

Macroeconomic trends at international level shape both the growth opportunities and the complex risks that face critical sectors of the economy. Stability of the international economy affects developments on both demand (e.g. market growth, export opportunities and the availability of private- or public-sector funding) and supply (e.g. regulation, labour market and skills initiatives). This stability is affected by EU and national-level decisions on monetary, fiscal, trade and labour policy; by internal developments within individual Member States or the Eurozone (e.g. employment, productivity, interest rates, inflation rates and others); and by external factors in the interconnected global economy (e.g. trade deals or disputes, levels of economic growth in emerging economies etc.). Broadly speaking, higher levels of political and economic stability provide critical industries with increased certainty, and this incentivises organisations to invest in new infrastructure, technologies, human capital and intellectual property with a view to addressing the opportunities and risks they expect to face in future. Lower levels of stability increase the unpredictability of future macroeconomic trends, suppressing investment and reducing levels of confidence, as reflected in financial markets, investment levels or business surveys such as the Economic Sentiment Indicator (ESI).³³¹

The European Commission's *Economic Forecast Winter 2019* recognises that 'the EU economy is facing an exceptional amount of uncertainty related to trade policy and more generally the future of multilateralism,

³²⁶ Léautier & Lemer (2003).

³²⁷ KPMG (2017); Léautier & Lemer (2003).

³²⁸ U.S. Department of Homeland Security (2019b).

³²⁹ U.S. Department of Homeland Security (2019b).

³³⁰ Rijksinstituut voor Volksgezondheid en Milieu (RIVM). (2018).

³³¹ European Commission (2019d).

but also on the domestic side, including the future of the EU's economic relationship with the UK'.³³² Key areas of known risk include: a growing trade dispute between the US and China; uncertain prospects for EU–US trade talks and wider relations; enduring political disagreement over the future direction of Eurozone integration and fiscal and monetary policy at the EU level; variable levels of financial risk in different European banking sectors; and the impact of demographics, both in terms of rising pension, social and health-care costs, as well as youth unemployment.³³³ European integration means that the Netherlands may be particularly vulnerable to the impact of economic developments elsewhere in Europe; economic integration also reduces the control that Member State such as the Netherlands are able to have over their own economic policies, which are largely determined at the European level. This may reduce the ability of individual countries to uphold their own sovereign interests.³³⁴ The UK's decision to leave the EU also raises questions about the terms of any future relationship, which are especially important for highly connected nations such as the Netherlands, given the dominant role the City of London plays in global and European finance, as well as the potential for disruption of trade between the UK and EU due to tariff or non-tariff barriers.³³⁵

Just as critical infrastructure, sectors and processes are becoming increasingly globalised, interconnected and interdependent,³³⁶ another, opposite, shift is occurring – an increasing adoption of protectionist policies by national governments.³³⁷ During the financial crises numerous governments intervened to support the domestic economy by introducing stimulus programmes, some of which were shaped in line with domestic procurement policies and practices.³³⁸ These measures, however, were not crisis-exclusive phenomena, and the trend towards protectionism appears to have continued.³³⁹ The total number of newly introduced discriminatory interventions in Europe (in other words, protectionist measures in public procurement processes) steadily increased between 2009 and 2017. The average annual number of implemented measures totalled 56. The majority of these instruments was introduced in 2014 and 2012, totalling 69 and 64 respectively.³⁴⁰ Such interventions include import tariffs, anti-dumping, trade finances and grants, export taxes and subsidies, as well as specific public procurement localisation policies.³⁴¹

Protectionist infrastructure policies can be understood as a countermeasure against the perceived threats associated with globalisation and interdependence. However, overly protectionist policies may increase costs and reduce the quality of critical infrastructure, due to a lack of market competition (see section on

³³² European Commission (2019d).

³³³ Martin (2016).

³³⁴ Scharpf (1999).

³³⁵ Ries et al (2017).

³³⁶ Setola et al. (2016).

³³⁷ KPMG (2017).

³³⁸ Kutlina-Dimitrova (2018), Bussière et al. (2010).

³³⁹ Kutlina-Dimitrova (2018).

³⁴⁰ Kutlina-Dimitrova (2018).

³⁴¹ Kutlina-Dimitrova (2018).

the ‘lack of competition’).³⁴² Nonetheless, in response to the vulnerabilities associated with interdependence, some countries are beginning to adopt protectionist measures, and may continue to do so. Outside of the EU, the US has demonstrated an increasing appetite for protectionism, such as President Trump’s introduction of a 25 per cent tariff on all Chinese steel imports in 2019.³⁴³ Recent examples highlighting protectionist measures include Australia’s 2016 decision to block Chinese companies from purchasing one of the country’s main electricity distributors, AusGrid, based on national security concerns.³⁴⁴

The political and economic paradigm of foreign states

The economic behaviour and relative power of potentially hostile nations may have implications for national security. For example, the economic rise of emerging powers such as China, and an increasingly outward facing Russia – both of which are dominated by state-owned companies – has particular implications for privatised industry in Europe and elsewhere. At the beginning of the 21st century, a global trend towards privatisation took place, involving a deliberate shift away from government ownership of businesses and reduction of the influence of governments over business activities.³⁴⁵ Since 2004, a range of different asset types have been subject to privatisation, including infrastructure assets and smaller enterprises.³⁴⁶ More recently, the privatisation trend appears to have slowed and may begin to reverse over the coming years, in favour of government ownership.³⁴⁷ In its place, a shift towards what can be described as ‘state capitalism’ appears to be emerging. This trend is characterised by a system in which national governments promote the interests of leading (sometimes state-owned) companies in key national industries, constrain inward FDI, and restrict competition.³⁴⁸

State-owned enterprises are among the largest and fastest expanding multinational companies.³⁴⁹ Differences in definitions of state ownership and state control, however, make it difficult to measure this trend.³⁵⁰ The internationalisation of state-owned enterprises (SOEs) raises important new issues in relation to cross-border investments and disclosure practices.³⁵¹ Chinese state-owned corporations have for example become dominant players in acquiring ownership of European energy companies, buying stakes in Portuguese, Greek and Italian public utilities.³⁵² In developing countries, aligned with the expansion of the Belt and Road Initiative and to broaden its geopolitical and economic interests, China has recently pursued a targeted strategy to provide credit or debt relief in exchange for collateral consisting of natural

³⁴² KPMG (2017).

³⁴³ BBC (2019a).

³⁴⁴ KPMG (2017).

³⁴⁵ Megginson (2017).

³⁴⁶ Megginson (2017).

³⁴⁷ Megginson (2017).

³⁴⁸ Megginson (2017).

³⁴⁹ World Economic Forum (2013).

³⁵⁰ World Economic Forum (2013).

³⁵¹ OECD (2017).

³⁵² Trumbo Vila & Peters (2016).

resources (such as minerals) or access to key infrastructure (such as ports), resulting in the target countries' dependency and challenges to self-reliance.³⁵³

Uncertainty related to resource security

The growing integration of European and global supply chains, the reliance on volatile external sources for many key components, materials and energy supplies,³⁵⁴ and the increasing adoption of Just-in-Time (JIT) production and logistic models all bring challenges to managing the resilience of critical sectors.³⁵⁵ Factors such as these both increase the likelihood of strategic shocks – by driving increased complexity and interconnectivity – and threaten the contingencies or resources in place to respond when such destabilising incidents do occur.

In the context of increasing uncertainty around supply of critical materials and natural resources, the global energy system in particular appears to be undergoing significant transformation.³⁵⁶ These changes include growing electrification, the expansion of renewables, upheavals in the oil industry and globalisation of the natural gas markets.³⁵⁷ These trends are anticipated to impact global supply and demand, as well as access to critical resources.³⁵⁸ Fluctuating prices in the energy sectors are likely to remain a feature of the global economy for the foreseeable future, creating a level of uncertainty, particularly for countries reliant on external suppliers of energy and natural resources. Europe has recently experienced higher oil prices, which has benefitted oil-producing nations such as Norway and Russia, while negatively impacting importing countries.³⁵⁹ Global energy demand is predicted to grow by more than 25 per cent by 2040, requiring more than \$2 trillion a year of new investment in energy supply, as estimated by the International Energy Agency (IEA).³⁶⁰ The global share of energy demand and consumption has shifted towards Asia in recent years, and this trend is expected to continue.³⁶¹ While the global energy system is likely to continue being dominated by fossil fuels, the use of alternative energy generation and storage in OECD countries and China could begin to alter the balance and reduce global competition for 'traditional' resources such as oil and gas, thereby also reducing the dependency on external providers of these resources.³⁶² This development occurs just as natural gas production is declining (an estimated 100 billion cubic metres of long-term contracts will expire by 2025), and it is expected that the EU will need to seek additional imports by 2025 in order to meet its anticipated consumption.³⁶³ It is expected that Russia will remain the primary supplier of natural gas to Europe,

³⁵³ Green (2019).

³⁵⁴ European Commission (2019)

³⁵⁵ Bailey et al. (2018).

³⁵⁶ International Energy Agency (2019).

³⁵⁷ International Energy Agency (2019).

³⁵⁸ International Energy Agency (2019).

³⁵⁹ International Monetary Fund (IMF) (2018).

³⁶⁰ International Energy Agency (2018).

³⁶¹ International Energy Agency (2018).

³⁶² Gros et al (2018).

³⁶³ Zeniewski (2019).

which poses potential risks in terms of overreliance on a single supplier.³⁶⁴ Limitations in Europe's import infrastructure (over 50 per cent of pipelines operate at monthly peaks above 80 per cent) may further exacerbate problems of supply.³⁶⁵

3.4.2. Technological and information trends

Digital transformation and the growth of the industrial Internet of Things (IoT)

The continued shift towards digitalisation and the industrial IoT, characterised by digitally interconnected systems and supply chains, have increased potential vulnerabilities for critical infrastructures, sectors and processes. Some commentators anticipate that Economic Information Warfare (EIW), involving sophisticated attacks against entire economies, commerce and enterprises will accelerate as a global threat.³⁶⁶ The energy and utilities sectors are expected to become increasingly digitalised over the coming years,³⁶⁷ yet the interdependence of other digitally connected critical infrastructures on this sector would be likely to amplify any negative consequences that occur in the event that facilities are compromised. This is exemplified by the experience of Ukraine in 2014, in which cyber attacks against the country's power grid resulted in a widespread blackout that impacted the provision of basic services, such as 911 call centres, emergency services, hospitals and drinking water systems.³⁶⁸

The digitalised and globally distributed supply chains in critical sectors also create opportunities for industrial espionage or sabotage.³⁶⁹ The sourcing of digital hardware, software and services from globalised supply chains creates opportunities for hostile actors to introduce compromised components or spyware into a system or network.³⁷⁰ The 2017 Triton attacks against a Saudi petrochemical plant provide one example of these risks. Triton malware designed to disable the plant's industrial control systems was introduced through a specific brand of controller.³⁷¹ Such threats could also materialise for other critical infrastructures and sectors that rely on industrial control systems, such as water treatment facilities and chemical plants.³⁷²

Growing security threats are also associated with the digitalisation of the financial sector. For example, the increasing uptake of financial technologies such as digital currencies and cryptocurrencies (such as bitcoin) is largely unregulated, with no central supervisory body to regulate virtual exchange rates or oversee

³⁶⁴ Zeniewski (2019).

³⁶⁵ Zeniewski (2019).

³⁶⁶ Ventre (2016).

³⁶⁷ Leal-Arcas et al. (2018).

³⁶⁸ Sullivan & Kamesky (2017).

³⁶⁹ Livingston et al. (2019).

³⁷⁰ Livingston et al. (2019).

³⁷¹ Livingston et al. (2019).

³⁷² Livingston et al. (2019).

transactions.³⁷³ Virtual transactions are much harder to trace, meaning that they may complicate the oversight and control of efforts to police arms trafficking, money laundering or terrorist financing.³⁷⁴

The growing technological dependency of critical sectors may also create new vulnerabilities. Critical reliance on technologies such as consistent internet access may reduce the government's ability to provide essential services in the event that such services are compromised. In this regard, the Amsterdam Internet Exchange (as the world's largest internet exchange point) is an important national asset, but also a critical vulnerability for the Netherlands.³⁷⁵ Finally, growing technological reliance also poses digital risks to the transport sector. The automation and digitalisation (of vehicles and systems) is expected to increase efficiency, but risks making national transport infrastructure increasingly vulnerable to cyber attack or systems failure.³⁷⁶

Potential concerns about information integrity and trustworthiness

With the increase in data flows and information transfer, potential concerns are emerging about the integrity of the information transmitted, its source, its nature and purpose.³⁷⁷ Media reports of alleged campaigns aimed at distorting evidence or undermining facts have become more widespread, and there is growing evidence of purposeful disinformation carried out for economic gain or in order to intentionally deceive the public and cause public harm.³⁷⁸ Purposeful disinformation and manipulation with information (e.g. by hacking) can have direct influence on critical sectors and processes, particularly by undermining democratic elections and social cohesion, or misrepresenting government policy decisions (e.g. in relation to large scale public investments, such as those related to critical infrastructure and sectors).

The purpose of disinformation and distortion of evidence is to deliberately influence the policies or opinions of those who are exposed to it.³⁷⁹ Motivations behind the use of disinformation may be strategic (as with Russian *disinformatzya* tactics)³⁸⁰ or economic (e.g. those who conduct such activities in order to receive advertising revenue or other financial gains).³⁸¹ Ultimately, actors involved in undermining information integrity seek to manipulate the information environment that underpins national decision-making processes.³⁸² Lower-level, more insidious disinformation tactics can be used to distort public

³⁷³ Kaminskaya & Petrova (2018).

³⁷⁴ Kaminskaya & Petrova (2018).

³⁷⁵ Ams-ix (2019).

³⁷⁶ Molnar (2018).

³⁷⁷ Kavanagh & Rich (2018) and ongoing RAND Europe research on 'Truth Decay'.

³⁷⁸ European Commission (2018a).

³⁷⁹ European Parliament (2015).

³⁸⁰ Morgan (2018).

³⁸¹ One pertinent example of such economic incentives is the public relations industry of the Philippines, in which businesses compete to provide their clients with the greatest degree of control over online political narratives. This subcontracting of disinformation activities has connected the commercial and career incentives of PR professionals with the objectives of national political parties. See: National Endowment for Democracy (2018).

³⁸² Kavanagh & Rich (2018).

perceptions of events or issues, erode public trust in state institutions, and amplify social divisions and fear.³⁸³ This can ultimately undermine social cohesion and resilience, threatening domestic stability and the effective functioning of society.³⁸⁴

The increasingly vast amounts of personal and sensitive user data held by private companies has emerged as a considerable security concern in recent years, in a modern manifestation of the concerns raised by early CPE theorists regarding the structural power of large transnational companies. Many concerns also focus on the ability of large companies to apply advanced data analytics to the personally identifiable information (PII) of citizens in order to design targeted misinformation campaigns and thereby influence critical processes, such as elections or other decision-making processes, or undermine the legitimacy of critical political institutions.³⁸⁵ This concern is particularly pertinent given the growing role of social media in influencing voter behaviour and therefore the outcome of elections.³⁸⁶ This highlights the security threats posed by the increasing influence of private sector actors in the political sphere. The Cambridge Analytica scandal provides one example of the use of data by private companies to influence critical processes, such as democratic elections (see Box 12).

Enabled by the sheer volume of data and information and the possible speed of the information flow, disinformation can spread through online media platforms fast, without the ability (or sometimes willingness) of media platform owners to verify the content.³⁸⁷ In addition to the potential spread of false news, new privately-owned media platforms also incentivise the spread of sensationalist or extreme content, a possibility that is exacerbated by the reach and speed of online media.³⁸⁸ At the same time, given the scale and reach of media platforms, the personal nature of how content is generated and the extent of sharing of external links mean that any initiatives to fact-check or otherwise engage with false, misleading or illegal content are very complicated, if not impossible. Further enablers of disinformation include the use of ‘bots’ (i.e. computer algorithms that automatically produce content and interact with humans on social media),³⁸⁹ which are able to emulate human behaviour and can for example, mimic a political movement.³⁹⁰ Users interacting with social media platforms may often be unaware that they are interacting with the content generated by automated bots, rather than curated by other human beings. This can affect or influence their behaviour, potentially inciting violence or other anti-social behaviours, and potentially undermining critical processes.³⁹¹ Some concerns focus on the fundamental issue of citizens’ statutory rights (such as freedom of expression, due process and non-discrimination) which, if

³⁸³ National Endowment for Democracy (2018).

³⁸⁴ National Endowment for Democracy (2018).

³⁸⁵ Isaak and Hanna (2018).

³⁸⁶ Persily (2017).

³⁸⁷ Matsa et al (2018).

³⁸⁸ Kavanagh & Rich (2018).

³⁸⁹ Davis et al. (2016).

³⁹⁰ Ratkiewicz et al. (2011).

³⁹¹ Burkhardt (2017), Najmabadi (2016).

violated, may represent a human security threat.³⁹² As a result, the European Commission has identified disinformation as a potential threat to democratic processes and the fabric of society and, ultimately, national security.³⁹³

In terms of its national security implications, the European Commission's high-level group of experts considers democratic processes such as elections, and the underlying democratic values that shape public policies in critical sectors, to be most vulnerable to the impact of disinformation.³⁹⁴ The integrity of critical democratic processes such as elections requires citizens to have access to accurate, reliable information upon which to base their decisions. However, elections are particularly exposed to the risks of disinformation. Such vulnerabilities might include false information regarding voting time and location, unfounded rumours about rigging and hacking of voting machines designed to erode trust, and the purchasing and non-transparent dissemination of political advertising.³⁹⁵

³⁹² Isaak and Hannah (2018).

³⁹³ European Commission (2018b).

³⁹⁴ European Commission (2018b).

³⁹⁵ European Commission (2018b).

Box 12. Use of data by private companies to influence elections – Cambridge Analytica

In 2018, it emerged that political consulting firm Cambridge Analytica (CA) had used the personal data of millions of citizens across the globe to influence their voting behaviour.³⁹⁶ Cambridge Analytica gained access to much of this data by purchasing it from social-media firm Facebook.

Using advanced algorithms to monitor and analyse the behaviour of social media users, Cambridge Analytica developed a methodology for the psychographic profiling of individuals based on their behaviour on social media platforms. The company was able to integrate this information with a large volume of public and private data gathered from social media platforms, browser usage, online purchases, voting results and more, to establish over 5,000 data points on individual citizens.³⁹⁷ By combining these data with the psychographic analysis, Cambridge Analytica developed a method for ‘micro-targeting’ individuals with messages and information more likely to influence their behaviour.³⁹⁸ Cambridge Analytica is now believed to have used this technique to influence the outcome of democratic processes including the 2016 US presidential election, the UK Brexit referendum, and the 2013 and 2017 presidential elections in Kenya, amongst others.³⁹⁹ In total, the firm is thought to have been involved to some degree in over 100 campaigns across five continents.⁴⁰⁰

As a result of these revelations, Cambridge Analytica has been subject to three investigations: one in the US as part of the investigation into Trump-Russia collusion in the 2016 Presidential election; and two in the UK – one by the Electoral Commission into CA’s possible role in the EU referendum, and one by the Information Commissioner’s Office regarding the use of data analytics for political purposes.⁴⁰¹

3.5. Summary

As shown in this chapter, academic, policy and grey literature sources discuss a number of economically related risks to critical infrastructure, sectors and processes that merit the consideration of policymakers. We have identified seven ‘risk vectors’ representing the vehicles through which economic variables and events can impact critical infrastructure, sectors and processes in ways that could threaten national security. These vectors are:

- **Ownership** (through control and influence) by public or private actors of critical infrastructure and sectors, or ownership of assets in physical proximity to critical infrastructure and sectors.
- **Espionage and access to sensitive information** enabled, for example, by physical proximity or ownership.
- **Natural resource dependence** on third countries and actors for the supply of critical raw materials and energy.

³⁹⁶ BBC News (2018).

³⁹⁷ Isaak and Hanna (2018).

³⁹⁸ Isaak and Hanna (2018).

³⁹⁹ Laterza (2018).

⁴⁰⁰ BBC News (2018).

⁴⁰¹ Cadwalladr (2018).

- **Supplier dependence** on specific suppliers for the provision and maintenance of critical infrastructure and processes, reinforced by the presence of a skills and technology gap and lack of competition that may result in reduced efforts to ensure resilience of critical infrastructure, sectors and processes as well as reduced innovation and R&D.
- **Government intervention** through expenditure, economic policy and regulation, which can have a strong influence on the quality, availability and resilience of critical infrastructure, sectors and processes.
- **Corruption and fraud**, which may undermine the resilience of critical infrastructure and potentially create opportunities for malicious actors to obtain physical or digital access to sensitive assets and information.
- **Socio-economic inequality** resulting from factors such as economic policies and neoliberal market forces, which may reduce the ability of citizens to provide for themselves, as well as risk social unrest and domestic instability that pose a threat to critical infrastructure, sectors and processes.

In addition, literature shows that a number of global economic and geostrategic trends could also present risk factors to critical infrastructure, sectors and processes, and therefore should be considered alongside an analysis of risk vectors linked to macroeconomic events and variables. These trends include:

- **Digital transformation and the implementation of industrial IoT**, bringing challenges in relation to security of supply chain, cyber security and risks of data espionage in critical sectors and processes.
- **Globalisation and interdependence** between critical infrastructure, sectors and processes of one country with others, magnifying risks to an individual country's national critical infrastructures, which can be affected through cascading effects from developments elsewhere.
- **EU economic trends** playing a critical role for the Netherlands, and other EU Member States, due to the tight interconnectedness via economic, business, political and governance structures, as well as an expanded influence of private actors over political processes.
- **The political and economic paradigm of foreign states** which, similar to protectionism, considers the risks related to different national economic models and their impact on the competitiveness in the area of critical sectors and processes.
- **Uncertainty in relation to resource security**, particularly in relation to reliance on foreign suppliers of energy and the uptake of alternative energy generation, distribution and storage technologies.
- **Potential concerns with regard to information integrity and trustworthiness**, which may act as an avenue for malicious actors – including private companies – to disrupt critical processes such as elections and democratic decision-making, and gain influence in critical sectors (such as telecommunications or political institutions).

A range of complex interactions exist between different risk vectors, their underpinning drivers and the global economic and geostrategic environment, some of which have been highlighted in this chapter.

However, it is beyond the scope of this study to consider the detailed mechanics or even to quantify the relationships between the macroeconomic variables and events, the risk vectors and the critical infrastructure, sectors and processes. Such a study would require a series of ‘deep-dives’ into each of these relationships and would probably benefit from a series of specific case studies of critical infrastructure, sectors and processes to depict, in detail, the underlying dynamics.

This study, instead, considers the strategic picture of macroeconomic variables and events and the avenues (risk vectors) through which they may impact critical infrastructure, sectors and processes as a sub-set of means by which a state can guarantee national security to its citizens. While this chapter includes a range of specific examples to illustrate the broader analytical conclusions, in the next chapter we explore the example of the Netherlands in relation to how some of the risk vectors may manifest themselves in practice, and what trade-offs may emerge for policymakers as a result.

4. The connections between economy and national security in the Netherlands

Based on the analytical framework proposed in Chapter 3, in this chapter we explore the potential the potential vulnerabilities of critical infrastructure, sectors and processes in the Netherlands due to the identified risk vectors. First, this chapter highlights some of the macroeconomic characteristics of the Netherlands to set the context for the ensuing analysis of vulnerabilities and challenges from selected risk factors. The risk vectors examined in greater detail are those selected on the basis of specific vulnerabilities that the Dutch economy is currently facing or that may become more apparent in the near future. A full assessment of all possible risks is not within the scope of this study and we therefore use three examples to illustrate the use of the conceptual framework. More specifically, this chapter focuses on the following vulnerabilities and risks:

- The relationship between foreign ownership and investments in critical infrastructure, products, and services, and the changing economic and political paradigms that ensue as a consequence of economic and political power shifts in the international system.
- Skills and technology gaps that appear in the Dutch economy as a consequence of an aging population and the increased demand for specialist skills required by the digital transformation that is occurring in societies and economies across the world.
- Future energy, food and resource needs of the Dutch society and economy, and the location of the extraction of the raw materials for these resources in the context of climate change and energy transition trends.

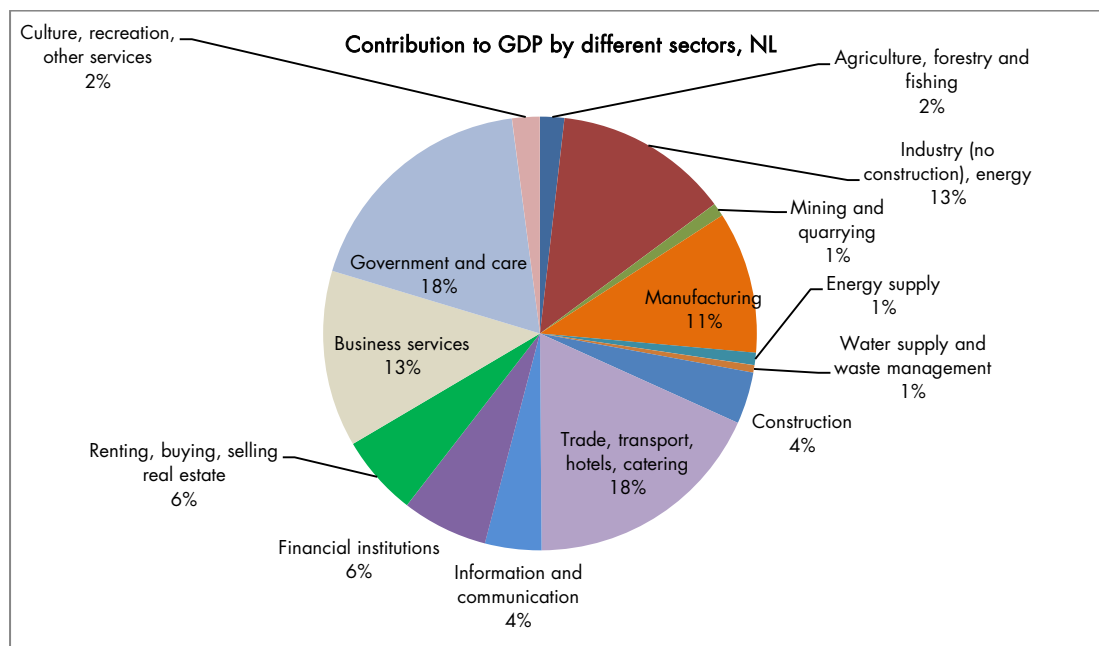
4.1. Unique characteristics of the Dutch economy and related economic risks

The Netherlands is a relatively small nation in land surface (number 134 in the world), but with a gross domestic product (GDP) of 830 billion US Dollar (€738 billion), it is the world's 18th largest economy. Hence, the Netherlands is the second most densely populated country in the EU, and has a concentrated network of physical infrastructure. Although the Dutch economy is relatively diverse and not focused in a handful of sectors (see Figure 4.1),⁴⁰² it is highly dependent on international trade. With the international

⁴⁰² World Bank (2019).

hub functions of the Port of Rotterdam, Schiphol airport and the Amsterdam Internet Exchange (AMS-IX), the country facilitates a gateway to Europe for large volumes of people, goods and services. At 86.5 per cent and 74.8 per cent respectively in 2017, the exports and imports of goods and services as a percentage of GDP rank among the highest in the world,⁴⁰³ leading to a positive trade balance of 55.8 billion US Dollars. Few countries have benefited more from the growth in international trade as the Netherlands. In 2018, the annual percentage growth rate of the country's trade value was about 2.5 times that of the global average.⁴⁰⁴ In the DHL Global Connectedness Index,⁴⁰⁵ the Netherlands emerges as the most interconnected country in the world.

Figure 4.1. GDP contribution by different sectors in the Netherlands, 2017



Source: World Bank (2019).

The Dutch economy is also deeply integrated within the EU, both politically and economically. The Netherlands is one of the six founding members of the EU and was one of the original members of the Eurozone and the Schengen area. Over time the Dutch population and its politicians have had a relatively consistent pro-EU political stance.⁴⁰⁶ As a member of the EU internal market, many trade barriers have been removed between the Netherlands and other Member States allowing for a free trade of goods and

⁴⁰³ World Bank (2019).

⁴⁰⁴ World Bank (2019).

⁴⁰⁵ Altman et al. (2018).

⁴⁰⁶ Euroskeptical parties have gained considerable popularity in recent elections, and centrist parties have adopted critical positions towards the EU (Korteweg 2017). In a recent vote, a majority of the House of Representatives (*Tweede Kamer*) adopted the position that the EU should drop the ambition of an 'ever closer union'. Yet, the latest Eurobarometer (European Parliament 2019c) suggests that 86 per cent of the Dutch population, the highest share in the EU, is opposed to a *Nexit*, and exit from the EU. (Hofs 2019).

services with these countries. As a result, much of the macroeconomic decision-making is determined at EU level.⁴⁰⁷

A total of 71 per cent of Dutch export goods are traded with other EU countries and 53 per cent of its imports come from within the EU.⁴⁰⁸ In 13 of the other 27 EU countries, the Netherlands is one of the top three EU trade partners. Therefore, the developments in these trade partner countries, and in the EU more broadly, are of great potential impact.

High reliance on international trade is likely to expose a country to global and regional trends more acutely due to the increased interconnectedness with other countries and regions through trade connections. In the Netherlands, such a degree of reliance on international trade is visible also within specific critical sectors. Table 4.1 shows the high intensity of trade in natural gas and transport services, as well as in the defence sector, with some of the indicators recently reaching near maximum levels.

Table 4.1. Trade indicators in critical sectors: Netherlands

| Critical sector | Exports (mln euro) | | Imports | | Trade balance | |
|---|--------------------|--------|---------|--------|---------------|---------|
| | 2016 | 2017 | 2016 | 2017 | 2016 | 2017 |
| Energy | | | | | | |
| Crude oil | - | - | 20,238 | 25,082 | -20,238 | -25,082 |
| Petroleum-based products | 39,715 | 45,907 | 26,122 | 29,837 | 13,593 | 19,070 |
| Coal | 607 | 837 | 1,854 | 2,260 | -1247 | -1423 |
| Electricity | 707 | 905 | 873 | 742 | -166 | 163 |
| Natural Gas | 8,700 | 9,100 | 6,100 | 8,400 | 2,600 | 700 |
| Transport services | | | | | | |
| Marine transport | 9,553 | 10,191 | 4,189 | 4,727 | 5,363 | 5,464 |
| Aviation | 8,235 | 8,772 | 4,519 | 5,143 | 3,716 | 3,629 |
| Other transport (incl. electricity distribution) | 12,684 | 13,535 | 10,111 | 12,679 | 2,573 | 856 |
| Financial services | 5,986 | 6,463 | 8,625 | 9,066 | -2,639 | -2,603 |
| Telecommunication services | 3,838 | 3,989 | 2,504 | 2,445 | 1,335 | 1,544 |
| Public sector services (incl. consulates, military services, etc.) | 1,845 | 1,649 | 254 | 179 | 1,590 | 1470 |

Sources: CBS (2019b) and CBS (2018).

The Netherlands is an open economy with a very advanced digital and physical infrastructure.⁴⁰⁹ As such, it has been an attractive market for foreign investors and, according to the OECD foreign investments

⁴⁰⁷ CBS (2019a).

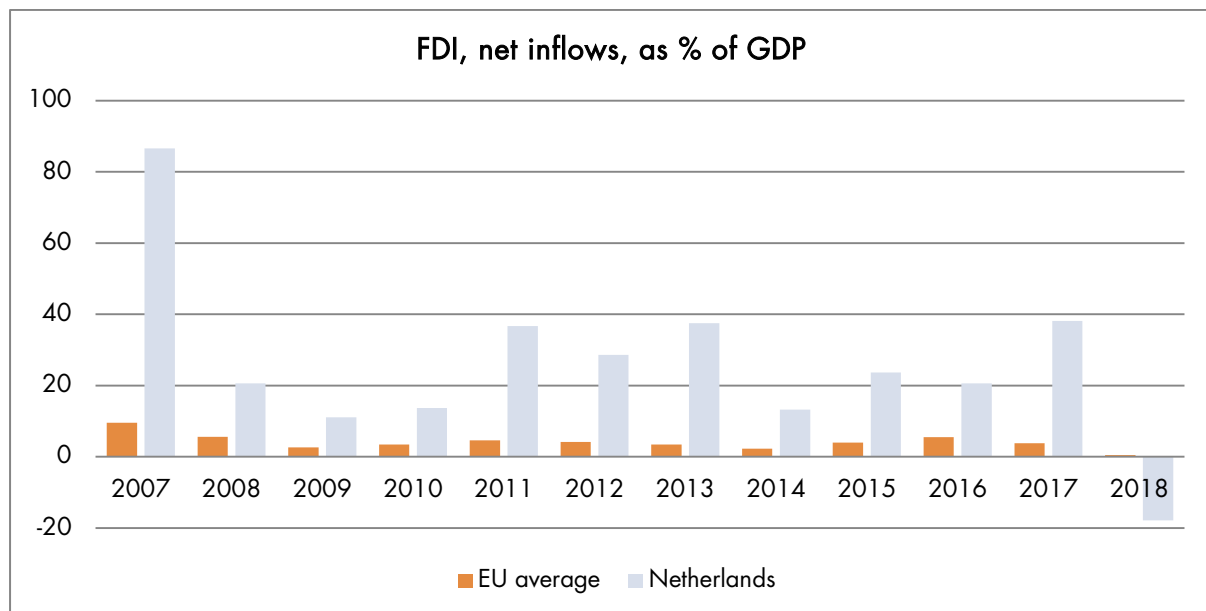
⁴⁰⁸ CBS (2019a).

⁴⁰⁹ KOF Swiss Economic Institute (2019).

restrictiveness index,⁴¹⁰ it is one of the least restrictive countries in the world (see Figure 4.2). As shown in the figure, the level of restrictions on FDI (such as, for example equity restrictions, requirements for screening and approval, and key foreign personnel requirements) in the Netherlands is uniformly low, including in sectors contributing to vital processes. Except for 2018, the FDI share of GDP in the Netherlands has been also significantly higher than the EU average (see Figure 4.2).⁴¹¹ While this openness brings great opportunities for economic growth, technology transfer, information exchange and international collaboration, FDI can also present potential risks to national security as it may facilitate access and control of critical sectors and processes by foreign actors with malicious intent.

Finally, drawing on the varieties of capitalism introduced by Hall and Soskice, the Netherlands can also be considered a coordinated market economy,⁴¹² within which there is considerable interaction between private companies and the public sector at the strategic level. Reaching tripartite consensus (involving employers, employees, government) on economic and social issues forms an essential part of decision-making.⁴¹³

Figure 4.2. FDI net inflows as % of GDP in the Netherlands



Source: World Bank data (2019).

⁴¹⁰ The FDI Regulatory Restrictiveness Index (FDI Index) measures statutory restrictions on foreign direct investment in 22 economic sectors across 69 countries, including all OECD and G20 countries.

⁴¹¹ In 2018, the FDI share of GSP in the Netherlands decreased significantly to a negative net share of -26.2%. See Figure 4.2 and World Bank (2019).

⁴¹² See also Hall & Soskice (2001).

⁴¹³ Also known as *Poldermodel*. While the dynamics of time might fluctuate the power balance, the system is still largely in place, although other scholars suggest differently. See also Paul de Beer *Erosion of the Polder Model*.

Table 4.2. FDI Restrictiveness index: Netherlands compared with OECD average

| FDI restrictiveness index (any restrictions; 0.000 = no restrictions) | Netherlands | OECD Average |
|--|--------------|--------------|
| Selected sectors contributing to vital processes | | |
| Oil ref. & Chemicals | 0.000 | 0.018 |
| Electricity | 0.000 | 0.116 |
| Electricity generation | 0.000 | 0.121 |
| Electricity distribution | 0.000 | 0.111 |
| Maritime | 0.023 | 0.248 |
| Air | 0.225 | 0.344 |
| Media | 0.000 | 0.154 |
| Radio & TV broadcasting | 0.000 | 0.221 |
| Communications | 0.000 | 0.083 |
| Fixed telecoms | 0.000 | 0.089 |
| Mobile telecoms | 0.000 | 0.076 |
| Financial services | 0.002 | 0.032 |
| Banking | 0.000 | 0.037 |
| Total FDI Index (all sectors) | 0.015 | 0.065 |

Source: OECD (2018).

In broad terms, the negative effects of economic activities from abroad on national security can be divided into three groups:

- Investment or cooperation makes the country dependent on a supplier of goods or services, which are crucial for the functioning of the economy. Or, the supplier is influenced or controlled by a foreign party that can refuse delivery, delay it or attach conditions to it.
- Investment or collaboration allows technology or expertise to be transferred to a foreign institution that can be deployed in a manner that is harmful to the national interests of the country by that foreign institution itself, or by its government.
- Investment or economic partnership (e.g. trade) opens up the possibility for tampering in the delivery of goods or services that are crucial for the functioning of the economy, where such tampering options could not arise in any other way.

4.2. Risks associated with foreign ownership in the Netherlands

Chapter 3 highlighted the three illustrative risk vectors related to FDI and foreign ownership. The primary focus of this discussion revolves around the possibility that investment and ownership provide access to gain influence and control over the operations of companies in critical sectors or who facilitate critical processes. This control could be used strategically or even misused, particularly if such investments are guided or supported by states that maintain competing economic and political systems. The way in which such political pressure could manifest itself in relation to the Dutch government could be by delaying services or interrupting critical processes, such as power distribution or telecommunications. This section provides a closer look at foreign transactions involving mergers and acquisitions (M&A), direct investment, joint ventures, outsourcing, offshoring and strategic collaborations in relation to Dutch companies, and where possible, disaggregates information pertaining specifically to critical sectors and processes.

Policymakers face trade-offs between policies that maximise economic benefits versus measures that minimise security risks, as this chapter will discuss. To inform the analysis of trade-offs in relation to specific economic activities – such as FDI, or trade or skills imports – a range of questions can be considered to better understand the nature of the security risk presented by economic activity in critical sectors/processes (Table 4.3). However, it should be emphasised that the relationships between these variables are far more complex and convoluted than the linear manner in which they are presented below. Table 4.3 does not fully capture the complexity of this matter and should therefore be understood as a simplified, high-level summary intended for illustrative purposes.

Table 4.3. Questions for consideration when assessing potential security risks

| RISK | | |
|--|---|--|
| VULNERABILITIES | THREAT | CONSEQUENCES |
| What are the vulnerabilities of the Dutch company/sector in question that could be exploited by a mal-intentioned foreign actor through an economic transaction and/or creation of economic dependence? | What is the nature of the 'threat' posed by economic activity to the company/actor in the critical process in question? | What are the likely consequences of the economic activity if the threat materialises? |
| What are the costs for the Netherlands (economic, social, political, environmental) if the supply of the goods or services constituting a critical process are subject to pressure as a result of the economic activity? | What are the benefits (economic, strategic, political, security) to the foreign supplier (and their state, if relevant) from acquiring control or influence over a company or resource-supply that plays a role in providing critical processes in the Netherlands? | What would be the damage caused by an information leak from, or surveillance or disruption of the critical process in question if the threat materialises? |

4.2.1. Major sources of FDI into the Netherlands

In 2017, 35 per cent of all 714 M&A deals involving Dutch companies included a foreign investor into the Dutch company.⁴¹⁴ This number has been steadily growing over the last decade although the total value of deals has fluctuated over the years. Of foreign takeovers, the buying company was located within the European Union in 60 per cent of acquisitions, 20 per cent were located in the US, and only in 2 per cent of cases were Chinese enterprises involved.⁴¹⁵

⁴¹⁴ KPMG (2017b).

⁴¹⁵ KPMG (2017b).

While relatively small in proportion, Chinese investments into Dutch companies have been the subject of various analyses over the last ten years.⁴¹⁶ These suggest that a shift of focus has occurred from companies in the food and agriculture sectors to both high-tech sectors and more strategic investments across all sectors. The latter are defined as not necessarily based on market access, but for instance to acquire access to resources, technology or knowledge.⁴¹⁷ Examples of larger scale Chinese takeovers of Dutch companies over the past 20 years are limited, for instance:

- The acquisition of Spyker in the automotive sector;
- Vivat, an insurance company (which recently returned to Dutch ownership); and
- Standard Products/Nexperia and RF-Power (two branches of Dutch chipmaker NXP) in the semiconductor sector.

4.2.2. FDI in Dutch critical sectors

In 2016 and more recently, media attention has highlighted the integration of the Port of Rotterdam into China's Belt and Road Initiative and the growing Chinese influence in the port, especially given uncertainty over the type of influence Chinese state-sponsored enterprises may have in critical infrastructure hubs. In 2016, COSCO Pacific (a subsidiary of China COSCO Shipping Corporation) acquired 35 per cent of the automatic container terminal Euromax in the Port of Rotterdam,⁴¹⁸ consolidating the companies' footprint in one of the major port hubs in Europe. In 2019, a Memorandum of Understanding was signed between the Port of Rotterdam and Chinese and Dutch railway link operators, expressing the ambition to integrate the port into the Belt and Road Initiative by extending the rail transport link to Chengdu (province of Sichuan).⁴¹⁹

Yet, it has not only been take-overs of Dutch companies by non-western countries that have attracted attention in recent years. Considerable discussion has accompanied the takeover of Dutch cybersecurity firm Fox-IT by British company NCC Group,⁴²⁰ not least because the Dutch government relies on Fox-IT for encryption of parts of its classified communication. More than a year after the acquisition had taken place, the Dutch government entered into negotiations with Fox-IT to put in place better safeguards for secured access and storage of its data, and to fence off any future assignments the government might give to Fox-IT.⁴²¹

Recently, smaller Dutch high-tech companies have been sold to foreign firms, raising particular concerns about potential knowledge and data export from the Netherlands to third parties who may not put in place sufficient data protection measures. These transactions included the acquisition of Redsocks Security

⁴¹⁶ See Clingendael (2019); Seaman et al. (2017); Björn & Kostka (2016); Advisory Council for Science and Technology Policy (AWT) (2012); Mennen (2014); Hague Centre for Strategic Studies (HCSS) (2014).

⁴¹⁷ Seaman et al. (2017).

⁴¹⁸ Lockett (2016).

⁴¹⁹ Van Leijen (2019).

⁴²⁰ Tweede Kamer der Staten-Generaal (2017).

⁴²¹ Leijten and Rosenberg (2017); Executive People (2018).

by Romanian firm Bitdefender; the acquisition of Security Matters by American company Forescout Technologies; the acquisition of telecommunications and IoT specialist Teleena by Indian company Tata Communications, and the acquisition of data-center provision company Evoswitch by American firm Iron Mountain.⁴²²

4.2.3. Proactive regulation of foreign ownership in the Netherlands

Similar to other EU Member States, the political and policy debate about expanding monitoring mechanisms on foreign investments has become more prominent since 2007. Following the emergence of sovereign wealth funds and hedge funds and the controversial sale (or ‘sell-out’ according to critics) of some Dutch companies, a political debate took place from 2007 on whether it is necessary and desirable to secure certain sectors in the Netherlands against foreign economic transactions. Any proposed additional regulatory or review regime had to consider the costs it would induce and whether the problem was sufficiently grave to legitimise a new instrument. Also, it would have to fit within the EU regulatory frameworks. Initial discussions within the Cabinet with regard to screening and review of foreign transactions focused primarily on how harmful behaviour could be combated without jeopardising the identity of the investor, attracting investments and Dutch investments in other markets. Based on this, the first set of options revolved around adapting the Dutch regulatory system following an example of the British model.⁴²³ In the end, however, the then Minister of Finance Wouter Bos decided that the introduction of the British model in the Netherlands was not possible. The model was deemed not to represent a good fit for the Dutch context due to the risk of politicising controls of M&A activity, while providing only limited added value (only increased security of supply in the defence sector was mentioned).⁴²⁴ The coalition government (Balkenende IV) therefore concluded that Dutch strategic sectors could be protected through existing Dutch competition, corporate and financial supervision legislation, supplemented with sector-specific legislation.

Recent years have seen frequent calls for more comprehensive assessment mechanisms, including those focused explicitly on national security interests. The case of the takeover of the formerly state-owned telecom company KPN (see Box 13) by Mexican company América Móvil represents a marked watershed moment in the debate. Since the attempted acquisition of KPN, the Netherlands has been developing legislation to screen foreign investments, initially focusing on the telecommunications sector. The *Wet ongewenste zeggenschap telecommunicatie* (‘Undesirable Control of Telecommunications Act’) was introduced into Parliament in March 2019,⁴²⁵ but is still under considerable debate, both for technical (the type of intervention proposed) and more fundamental (the intention of the draft law) reasons. The basic premise of the Bill is that organisations investing in the Netherlands’ telecommunications sector for

⁴²² Toet (2018).

⁴²³ This model includes the possibility of government intervention in a merger or acquisition for reasons of public interest.

⁴²⁴ Second Chamber of the States General (2009).

⁴²⁵ De Staatssecretaris van Economische Zaken en Klimaat (2017).

geopolitical reasons could potentially cause societal disruption and gain the opportunity to tap into confidential communication flows.

Box 13. The attempted Mexican takeover of Dutch Telecom Company KPN

The attempted acquisition of the Netherlands' main landline and mobile telecommunications company, and formerly state-owned company, KPN, gave rise to heightened political debate.⁴²⁶ In September 2013, Mexican company America Móvil, owned by business magnate and billionaire Carlos Slim, made a bid to acquire all shares in the Dutch telecom company. Due to stalled negotiations the takeover did not materialise. New policy initiatives with regards to the country's economic security, such as the establishment of an interdepartmental Working Group on Economic Security, chaired by the NCTV, were a direct result of this incident.⁴²⁷

In response to the debate, then-Minister of Economic Affairs Henk Kamp stated the government takes into account two risks when assessing foreign acquisitions: geopolitical risks and security risks.⁴²⁸ The former, he argued, relate to the acquisition of companies considered part of the critical Dutch infrastructure to serve as an instrument of power to put pressure on the government of the Netherlands. In the case of KPN there were indeed geopolitical risks associated to a foreign acquisition of the company. The owner could for example threaten to shut down telecom services across the country. Since KPN has ownership of a large part of the Dutch telecom network on which many vital government services rely, as well as other telecom providers, this could be particularly damaging to the country.

With regard to security risks, the Minister referred to restrictions on access to information. In the case of KPN, a foreign takeover could potentially compromise the confidentiality of communication, including highly sensitive communication, such as classified information. Secondly, the confidential nature of requests for telecom data by security and investigative services and their lawful interception of telecommunications could potentially be breached.

At the EU level, a new EU framework for the screening of FDI officially entered into force in the spring of 2019.⁴²⁹ The framework is intended to defend European strategic interests by being able to examine foreign companies that target these interests. The European Commission and EU Member States aim to take steps to ensure that the EU can fully apply the Investment Screening Regulation as of 11 October 2020. These steps concern, in particular, the setting up of the new EU-wide mechanism for cooperation, enabling Member States and the Commission to exchange information and raise concerns related to specific foreign investments.⁴³⁰ The framework is restricted to screening investments for security and public order concerns, and does not include additional economic criteria.⁴³¹ The regulation also requires

⁴²⁶ De Witt Wijnen (2018).

⁴²⁷ Wetenschappelijke Raad voor het Regeringsbeleid (WRR) (2017).

⁴²⁸ Tweede Kamer der Staten-Generaal (2014).

⁴²⁹ European Parliament (2019a).

⁴³⁰ Regulation (EU) 2019/452 of the European Parliament and of the Council of 19 March 2019 establishing a framework for the screening of foreign direct investments into the Union.

⁴³¹ European Commission (2019).

Member States with a screening system already in place to screen intra-EU investments that involve EU companies controlled by non-EU owners.⁴³²

Parallel to the EU process, individual EU Member States, including the Netherlands, have updated or are considering implementation of screening regimes focused on security and public order criteria. High-tech, artificial intelligence, dual-use technology, quantum, robotics and semi-conductors are some of the processes, products and services specifically mentioned.⁴³³

4.2.4. Trade-offs between commercial benefits versus security risks in the Netherlands

As noted in Chapter 3 (see Box 5), vigorous discussions are held in the EU as well as across the Atlantic with regard to the potential security risks that could emerge if Huawei were to be granted the licenses and spectrum allocation for provision of extensive parts of the 5G network. At the same time as concerns are raised over potential risks of subversive access to information flows, Huawei is also seen to offer the most advanced 5G technology on the market for highly competitive prices, beating other technology providers such as Nokia, Samsung, Ericsson and others.⁴³⁴ Indeed, in comparison with other European and US rivals, Huawei holds 1,529 5G standard essential patents – 132 more patents than the closest rival, Nokia (with 1397 patents), and 742 more than the next US rival, Qualcomm (with 787 patents).⁴³⁵ As a result, national and EU authorities responsible for regulating the roll-out of 5G technology are faced with the need to make balanced decisions that take into account commercial factors at the same time as meaningfully assessing the magnitude of security risks potentially presented by Huawei.

In the Dutch context, a special economic security task force was set up by the Dutch government to examine in detail whether additional security measures needed to be put in place to secure the development of the 5G network in the Netherlands (see Box 14). The task force identified a range of measures to be implemented but did not single out any country, company or supplier as representing potentially greater security risks than others.

⁴³² Also known as Ultimate Beneficial Ownership (UBO). Examples are Logisor (CIC), Volvo Cars (Geely), and Pirelli (ChemChina).

⁴³³ Hanemann et al. (2019).

⁴³⁴ Johnson & Groll (2019).

⁴³⁵ Johnson & Groll (2019).

Box 14. Considerations regarding Huawei investment in 5G infrastructure in the Netherlands

In response to the announcement of Dutch telecom provider KPN that it planned to hire Huawei for the development of the mobile radio and antenna parts of the 5G network,⁴³⁶ and to parliamentary questions that followed that announcement,⁴³⁷ the Dutch government installed an Economic Security Task Force. The task force was asked to examine whether additional measures were necessary to guarantee the secure development of the 5G network in the Netherlands. To determine this, it conducted a risk analysis in conjunction with the intelligence services and three major telecom operators in the Netherlands.

In a letter to Parliament the Dutch government announced three types of measures to protect telecom networks, specifically 5G.⁴³⁸ The first group is focused on updating existing security measures that are currently in place at existing telecom providers. The second deals with setting high security requirements for suppliers of services and products in critical parts of the telecommunication network. Third, the government announced a structured process to monitor organisational and technological developments within the Dutch critical infrastructure.⁴³⁹ Each of these measures will be further elaborated on in the Autumn of 2019, and the Dutch government explicitly recognises the need for European collaboration to improve 5G security within the EU.

Any specific reference to geographic origins of product or service providers is excluded in the measures of the Dutch government.⁴⁴⁰

4.3. Skills gaps in technical professions and the increased risks for critical processes

Another risk vector of high relevance for the Netherlands is the presence of potential skills gaps to enable the design, operation and maintenance of critical infrastructure, sectors and processes. Without the necessary human capital in place, a country risks being unable to sustain its critical sectors, instead relying on recruiting talent from other countries or sourcing services from an external provider. All of these options could present risks to national security as the provision of vital processes for the functioning of the national economy could fall into the hands of foreign professionals, whose activities may not be easy to supervise by Dutch authorities, if they are lacking the necessary know-how and understanding of these critical tasks.

4.3.1. The importance of technical skills for the effective functioning of critical processes

Several trends affect EU Member States' ability to secure sufficient supply of technical, IT and related skills in critical sectors. The digital transformation of the economy has contributed to an increasing need

⁴³⁶ Pelgrim (2019).

⁴³⁷ Motie van het lid Weverling c.s. (Kamerstuk 21501-33, nr.734) en motie van het lid Van den Berg c.s. (Kamerstuk 21501-33, nr.747).

⁴³⁸ Tweede Kamer (2019b).

⁴³⁹ *Nationale Veiligheidsstrategie 2019*, presented to Tweede Kamer on 7 June 2019.

⁴⁴⁰ Tweede Kamer (2019c).

for professionals with these skills, while their supply is under pressure due to demographic developments.⁴⁴¹ More specifically, the influx of young workers into the workforce is declining, while a relatively large share of the workforce is projected to retire over the next few years, with limited opportunities to transfer their skills to younger employees. In addition, as disinformation poses a growing risk to critical processes, such as democratic elections or political decision-making, digital and media literacy is an increasingly important skill required across the national workforce in order to combat such risks.⁴⁴² There is also a general trend of dispersion of Core STEM (science, technology, engineering and mathematical) workers from traditional Core STEM occupations and sectors (for example from electrical and mechanical engineering occupations into finance or high-tech companies), spreading out throughout the overall workforce. Finally, shifting back into STEM jobs can be unattractive (e.g. if alternative sectors offer better pay and working conditions), or even impossible, and this potential source of supply can thus become limited as well.

A number of occupations with high relevance for EU critical sectors have been identified as those where there is already a shortage of skilled workers to fill existing vacancies, including science and engineering professionals, ICT professionals, installers and repairers – occupations that are in heavy demand in many of the critical sectors as well.⁴⁴³

Many critical processes are dependent on a combination of information and communication technologies and operational technologies. Information and communication technologies allow for storage, retrieval, transmission and manipulation of data inputs to external computers (e.g. through internet transfer or using dedicated networks). Operational technologies are deployed to monitor the physical state of a system and alter its function, if deemed necessary. The physical systems underpinning many critical processes (i.e. the hardware and software) tend to be of older signature and are often operated by an increasingly ageing workforce.⁴⁴⁴ Unless sufficient documentation and mentoring is provided to pass on the operational knowledge from experienced operators to less experienced workers, there is a risk that the skills related to operation of systems underpinning critical processes will not be retained for the future. The risk is exacerbated by the fact that equipment and systems underpinning critical processes are custom-built for the recipient organisation and/or operator, and their functioning and maintenance requirements are considered proprietary intellectual property (making it difficult to transfer knowledge beyond the specific company that builds/operates them).⁴⁴⁵

⁴⁴¹ Bosworth et al. (2013).

⁴⁴² Department of Digital Culture, Media and Sport (2019).

⁴⁴³ Skills Panorama (2019).

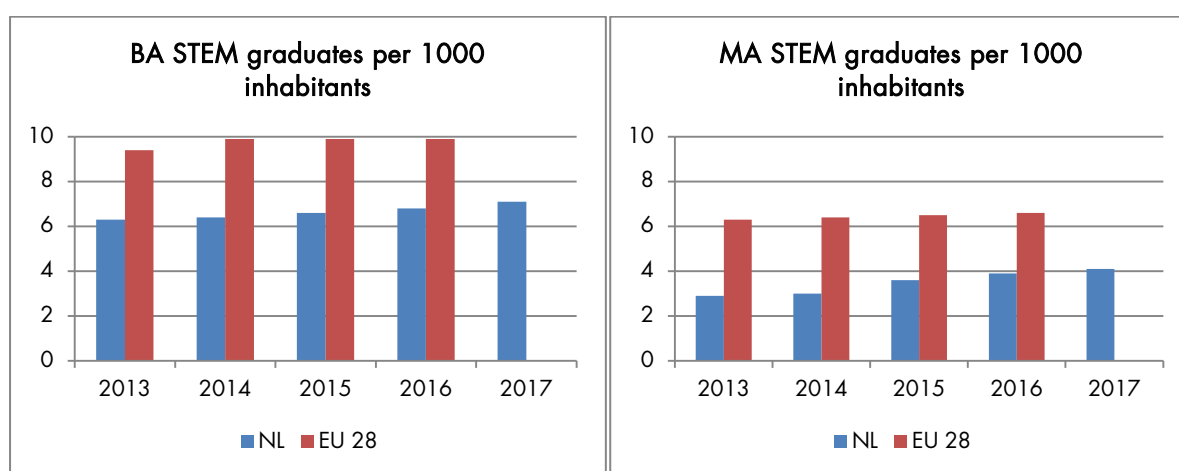
⁴⁴⁴ Harp & Gregory-Brown (2014).

⁴⁴⁵ Aging equipment and systems used in critical infrastructure and sectors, including, for example, energy distribution (power grids, pipes, electrical wires) and defence (e.g. defence platforms acquired 20–30 years ago and still part of national defence inventories) provide just a few examples of systems that are becoming difficult to support and maintain with retiring generations of skilled professionals familiar with how they operate.

4.3.2. Skills gaps in technical professions and the associated recruitment challenges for providers of critical processes

Similar to the broader trends in the EU, the Netherlands also faces challenges relating to the supply of STEM, ICT and related digital skills. As a matter of fact, compared with the EU average, the Netherlands has a relatively large unmet demand for STEM professionals. The most important cause for this is the low expected inflow of graduates in these disciplines. In the period 2007–2012, the Netherlands ranked lowest in the proportion of STEM graduates at tertiary level education (measured as a percentage of all fields) within the EU as a whole, with only 14.5 per cent of all graduates having enrolled in STEM disciplines, against an EU28 average of 22.8 per cent.⁴⁴⁶ While the situation has been improving, the Netherlands is still behind when compared to the EU 28 averages (see Figure 4.3).

Figure 4.3. STEM graduates, comparison between Netherlands and EU, 2013–2017



Source: Eurostat (2019).

With respect to ICT professionals, the situation in the EU overall is improving and the Netherlands retains a relatively high share of ICT specialists in the workforce when compared with other OECD countries. Yet the labour market is still dealing with significant shortages. In the most recent estimates (January 2017) of demand and supply at the EU level, this gap was projected to be 500,000 in 2020, down from an estimate of 756,000 released in December 2015.⁴⁴⁷ Also, in its bi-annual projections for the Dutch labour market, the Research Centre for Education and the Labour Market (ROA) at Maastricht University estimated that by 2022 in the Netherlands, 87 per cent of ICT professions will face supply shortages. Dutch employers will struggle to fill all the vacancies available in this sector.⁴⁴⁸

In addition to ICT, water, waste treatment, finance and insurance are also likely to experience future shortages in talent supply – representing sectors where numerous critical processes take place. The five sectors with highest expected employment growth between 2016 and 2030 in the Netherlands are displayed in Table 4.4 (highlighted occupations are highly relevant for critical sectors and processes).

⁴⁴⁶ Skills Panorama (2014).

⁴⁴⁷ European Commission (2017).

⁴⁴⁸ Fouarge (2018, 52).

Table 4.4. Expected change in employment in the Netherlands (2016–2030). Critical sectors highlighted in blue

| Sector | Projected change in employment (%) |
|---------------------------|------------------------------------|
| Professional services | +22.6 % |
| Water and waste treatment | +15.0% |
| Finance & insurance | +12.8% |
| Arts & recreation | +11.6% |
| ICT services | +10.6% |

Source: Skills Panorama (2019).

4.3.3. Skills supply and possible reliance on foreign human capital in Dutch critical sectors

While it is positive that the overall numbers of STEM graduates are increasing, it is also worth noting that some of the increase is coming from international students. This observation is relevant to this study for two reasons. First, the attraction of foreign students could conceal the potential supply of people to the Dutch labour market, as the majority of this group will not remain in the Netherlands. Second, attracting talent from abroad may introduce an additional vulnerability to the functioning of critical infrastructures, sectors and processes. While universities may accrue many benefits from foreign students, including increased collaborative opportunities, mutual access to advanced technology, financial benefits in terms of joint grant funding (or higher tuition fees levied on international students), they can also increase the chances of unwanted knowledge and technology transfer.

Currently, the largest number of international students comes from Germany, although the overall proportion of German students in the international cohort has declined from 40 per cent to 25 per cent between 2011 and 2018.⁴⁴⁹ Chinese students represent about 5 per cent of the international students' cohort, thus comprising the second-largest group of international students in the Netherlands. They are enrolled in both research universities and universities of applied sciences (which include Higher Vocational Education), although the numbers in the latter group are starting to decline slightly.⁴⁵⁰

As reported in the Nuffic report on *Incoming student mobility in Dutch higher education 2017–2018*, the volume of international students at Dutch universities continues to grow. This brings clear benefits in terms of international knowledge creation, researcher mobility and interaction, but can also increase the risk of a skills gap emerging in the Netherlands, if many of the graduates do not stay in the Netherlands but return to their home countries after graduation. Skills gaps resulting from student migration may create vulnerabilities that could be exacerbated by greater foreign investment or the recruitment of foreign workforce in critical sectors and processes to fill the skills gaps, increasing potential risks to the Dutch national security.

⁴⁴⁹ Nuffic (2018).

⁴⁵⁰ Nuffic (2018).

4.3.4. Upholding international collaboration while ensuring a pipeline of domestic talent

Dutch academic institutions have been open to student and staff exchanges, recruitment of international students, joint education or research projects and programmes, and the establishment of joint institutions. As a destination for researcher mobility, Dutch research institutions accrue many benefits from these collaborations, such as a supply of much-needed PhD students, a large influx of students able to pay much higher tuition fees, as well as access to cutting-edge international facilities and data, as identified by RAND's literature review on researcher mobility.⁴⁵¹ However, this collaboration has its risks and challenges as well, and European governments are increasingly evaluating the merits of specific types of collaboration on the grounds of having a clear strategy that balances the risks with potential benefits. It appears to be the case that European academic institutions and governments are also increasingly considering the downside of transnational exchanges. For instance, the exclusion of certain foreign nationals from specific study programmes or research projects (including the protection of critical infrastructure) are seen as a legitimate approach to take in order protect knowledge, technologies and critical information on national security grounds.⁴⁵²

Recently, the Dutch government issued a new policy paper on China entitled *The Netherlands and China: A New Balance*, also known as the government's China Strategy.⁴⁵³ This paper addresses concerns about the Chinese national influence on Chinese individuals and corporations, and warns about the risk of unwanted technology transfer and other consequences of collaboration in the academic sector.⁴⁵⁴ Yet, the discussion is not limited to Chinese students alone. Iranian students and researchers and those with ties to North Korea have also been increasingly screened by government agencies when applying for or entering sensitive technology studies.⁴⁵⁵

At the same time as the Dutch government seeks to mitigate the risks of knowledge or technology leaks in relation to critical sectors and processes by means of regulating some international research exchanges, it also recognises the need for proactive measures to build up a technical workforce domestically. In 2013 educational institutions, employers, employees, and regional and central government agreed on a national *Technology Pact* to find ways to satisfy the need for highly skilled technologists in the Dutch labour market.⁴⁵⁶ This foresees three lines of action to be undertaken in the years to 2020. The first aims to increase the number of pupils choosing to study in the field of technology. The second aims to increase the number of pupils and students with a technical qualification who progress to a job in technology. The third aims to improve the retention of technology workers within the technology sector, and find alternative jobs in technology for workers already in the sector who are at risk of losing their jobs. Particular attention is also being paid to the increase of female professionals in technical fields. In

⁴⁵¹ Guthrie et al. (2017).

⁴⁵² d'Hooghe et al. (2018).

⁴⁵³ d'Hooghe et al. (2018).

⁴⁵⁴ Netherlands Ministry of Foreign Affairs (2019).

⁴⁵⁵ Ministerie van Buitenlandse Zaken (2019).

⁴⁵⁶ Techniekpact (2014).

addition, the Dutch government has taken proactive measures to mitigate the risks associated with disinformation by providing school leaders with support and online materials for integrating media literacy into school curriculums, to develop these critical skills within the future workforce.⁴⁵⁷

4.4. National security risks associated with natural resources and food security

Uncertainty around resource security has been identified as one of the global and regional trends with the potential to have a highly disruptive effect on critical processes. In fact, the provision and distribution of some resources – specifically water, energy and food – are counted among the critical processes themselves, on which the functioning of a national economy relies in the first place (see Table 3.2).⁴⁵⁸ Within a national security framework, energy security in particular is often incorporated into the wider protection of critical national infrastructure, particularly with regards to physical infrastructure such as oil pipelines, nuclear facilities or power grids.⁴⁵⁹ A high dependence on imports of natural resources and other countries' infrastructure can create economic vulnerabilities, with cascading effects for the functioning of other critical sectors and processes.⁴⁶⁰

In 2014, the Netherlands imported around 180 billion kilos of raw materials for domestic consumption.⁴⁶¹ In terms of quantity, the lion's share of imports was taken up by fossil fuels, such as crude oil and natural gas,⁴⁶² non-metallic minerals (sand, gravel), biomass (wheat, soy, beans) and metal ores.⁴⁶³ However, for some raw materials, the Netherlands has a high degree of self-sufficiency, while for others, it relies fully on imports. For example, 80 per cent of biomass raw materials required for domestic consumption comes from domestically extracted resources; while 0 per cent of domestic metal consumption is covered by domestic extraction (in other words, all raw metals are imported).⁴⁶⁴ Just over 50 per cent of fossil fuels were derived from domestic extraction and just over 60 per cent of non-metallic minerals (see Figure 4.4).

⁴⁵⁷ EACEA National Policies Platform (2018).

⁴⁵⁸ Van Esch et al. (2014).

⁴⁵⁹ Flaherty & Filho (2013).

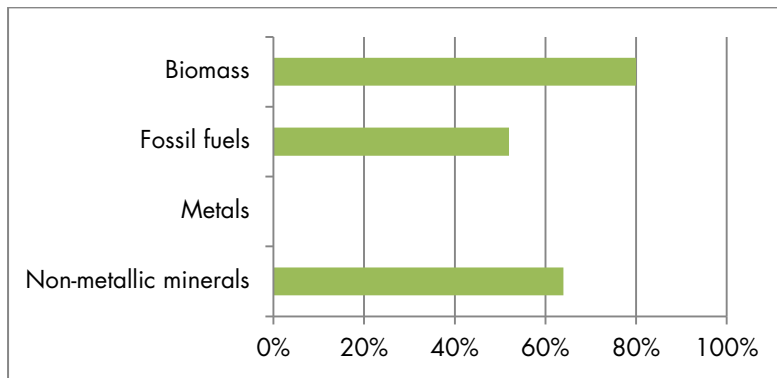
⁴⁶⁰ Van Bergeijk et al. (2015).

⁴⁶¹ Pol-de Jongh et al. (2016).

⁴⁶² While natural gas constitutes a large share of Dutch imports, the value of Dutch natural gas exports remains higher than its imports, with a trade balance of €700 million in 2017. See: CBS (2018).

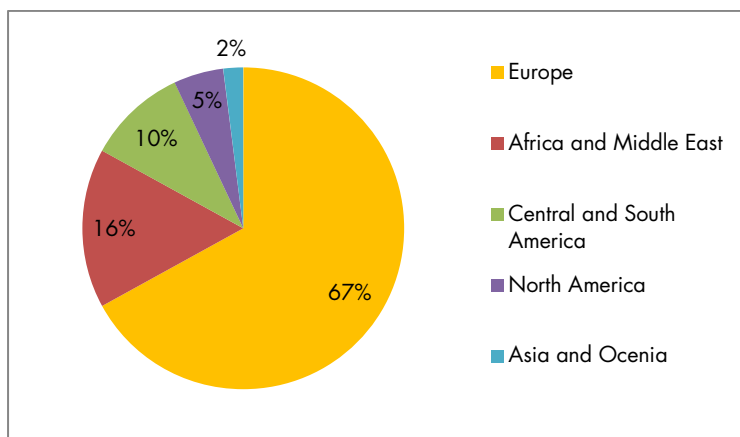
⁴⁶³ Pol-de Jongh et al. (2016).

⁴⁶⁴ Pol-de Jongh et al. (2016).

Figure 4.4. Percentage of resource consumption from domestic extraction, 2014

Source: Pol-de Jongh et al. (2016).

The origin of raw material imports into the Netherlands has stayed constant since the 2008 statistics were captured, with the majority of imports originating from Europe, consisting of: agricultural products, such as cereals, fossil fuels, and other mining products such as gravel. Crude oil has been imported from Africa and the Middle East and other raw materials, such as hard coal, have often come from Central and South America (see Figure 4.5).

Figure 4.5. Origin of imports of raw materials, 2014

Source: Pol-de Jongh et al. (2016).

While the Dutch economy is largely a services economy, and industry is not very dependent on the import of raw materials, there are several sectors where such dependence could pose potential risks for national security. This is because within the broader categories of raw materials, the resource dependency differs from resource to resource. While the overall resource dependency on biomass may be low (see Figure 4.4), domestic consumption of soybeans for animal feed relies primarily on imports (with Dutch extraction consisting mainly of potatoes). Also, in the fossil fuels category, much of natural gas consumption is covered by domestic extraction, while domestic consumption of crude oil and crude oil products relies heavily on imports.⁴⁶⁵ For metals, the Netherlands is fully reliant on imported materials.

⁴⁶⁵ Pol-de Jongh et al. (2016).

4.4.1. Geopolitical tensions and malicious acts in supplier countries

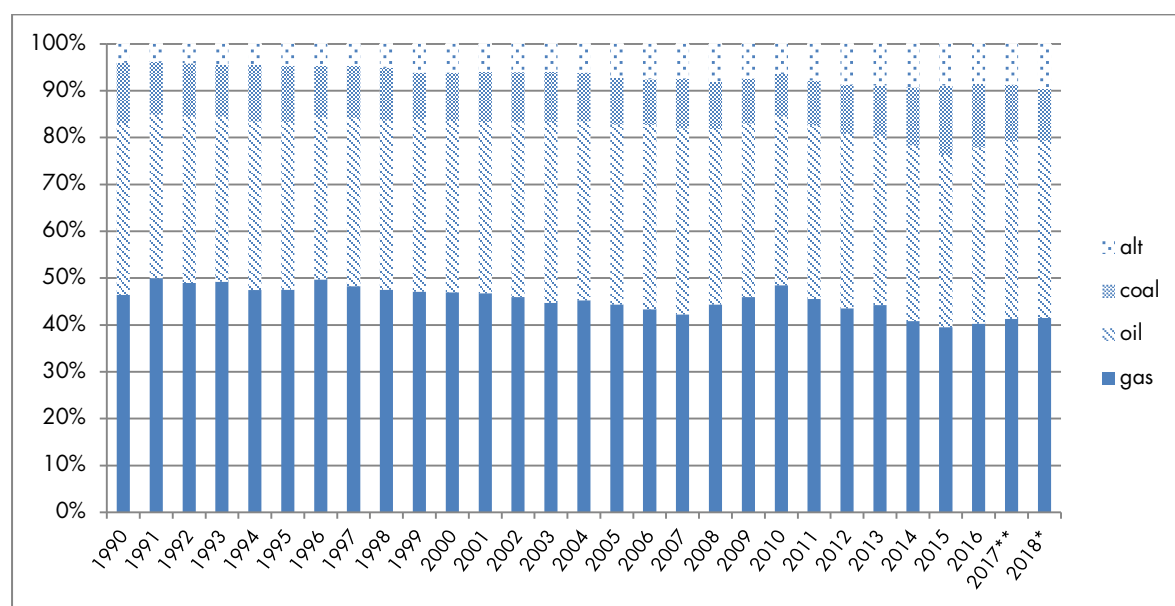
Of all available energy sources (e.g. oil, natural gas, coal, nuclear, hydropower, photovoltaic, biofuels and so on), oil and natural gas stand out when it comes to the potential for regional geopolitical tensions that are associated with their supply. Unlike renewable energy sources such as hydropower, wind and solar – which can often be locally produced – fossil fuel types such as oil and natural gas need to be imported by a large number of EU countries. Access to oil and natural gas supplies can be hampered due to internal instability in the country of production (e.g. Venezuela and Libya) or regional instability (common in Middle Eastern oil and gas supplier countries). Further risks may arise due to malicious activities such as cyber attacks or physical infrastructure disruptions (e.g. pipelines, oil tankers, etc.) that may disrupt energy transportation and supply – as demonstrated, for example, by the Russian-Ukrainian gas conflict in 2009, in which 18 European countries had to deal with disruption in gas supplies.⁴⁶⁶ However, it is also possible that energy security considerations within the EU will soon be altered significantly given the recent shift to shale gas extraction in the US and Canada, both of which are considered to soon become net exporters of oil (potentially even overtaking Saudi Arabia as the largest oil producers).⁴⁶⁷

4.4.2. Decreased levels of domestic natural gas extractions and the resulting recent increase in Dutch energy imports

As shown in Figure 4.6, the Netherlands has relied on natural gas and oil for the majority of its energy consumption. In 2017, the share of natural gas in the total primary energy supply was at 41.5 per cent; slightly higher compared to 37.8 per cent for oil. The remainder of energy consumption over the last three decades can be grouped under coal (11 per cent in 2017) and renewables (i.e. alternative energy) (9.7 per cent in 2017). As is demonstrated by Figure 4.6, this composition has not significantly changed over the past 30 years.

⁴⁶⁶ Stern et al. (2010).

⁴⁶⁷ Birol (2019), Canadian Association of Petroleum Producers (CAPP) (2019), Hague Centre for Strategic Studies (HCSS) (2014).

Figure 4.6. Breakdown of total energy supply in the Netherlands, 1990–2018

Source: CBS (2019). **represents revised provisional figures for 2017; *represents provisional figures for 2018

A major development in recent years has been the scheduled scaling down of natural gas extraction in the Netherlands. In 2018, natural gas extraction declined by over 200 PetaJoules (PJ) to 1,600 PJ, a reduction of 16 per cent. 2018 was the fifth consecutive year of decline and is related to output restrictions following the occurrence of earthquakes in the province of Groningen. Total output in the Netherlands now stands at less than half of the output before 2014.⁴⁶⁸

Reduced extraction levels are primarily offset by imports of natural gas. As of 2012, these imports have increased on a yearly basis; in 2018, more natural gas was imported (1,770 PJ) than was extracted domestically (1,580 PJ) for the first time. Exports have also followed a downward trend as of 2013. For the Netherlands, Norway was the largest source of gas imports (38 per cent), followed by Russia (~25 per cent) and the UK (~10 per cent). When it comes to oil, however, the Netherlands is the third highest importer of Russian oil in the world, after China and Germany.⁴⁶⁹

4.4.3. Dutch and EU-wide security concerns relating to the reliance on Russian energy

Russia was the largest supplier of natural gas to the EU in both 2017 and 2018, and also dominated the supply of petroleum oil.⁴⁷⁰ For extra-EU imports of natural gas, the only other partners with a significant share in total were Norway and – at some distance – Algeria and Qatar. For petroleum oil, other suppliers included Norway, Nigeria, Kazakhstan, Iraq and Saudi Arabia.⁴⁷¹ The heavy reliance on Russian energy imports has raised several security concerns across the EU (see Box 15), particularly in relation to the high

⁴⁶⁸ CBS (2019).

⁴⁶⁹ Statline (2019), Eurostat (2019).

⁴⁷⁰ Eurostat (2019).

⁴⁷¹ Eurostat (2019).

impact that could result from a disruption in energy supply (for example due to politically motivated acts), and subsequent impacts on critical sectors and processes – such as national and regional distribution of petroleum oils, supply of natural gas or even the operation of ambulances, hospitals (due to e.g. provision of gas for heating), fire services and others.

Box 15. Example of risks posed by natural resource dependence

Europe's reliance on Russian gas has been identified as a potential threat to security of European nations, making them vulnerable to politically motivated acts that could curtail gas supplies.⁴⁷² Since the end of the 1990s, Dutch gas policy is strongly geared towards cooperation with Russia. Moreover, the Netherlands has a strong trading relationship with Russia, which is its third trade partner outside the EU, and is considerable in size.⁴⁷³ In the past, Russian-Ukraine gas disputes caused heavy supply disruptions in EU countries. This relationship has come under serious pressure, particularly after the conflict in Ukraine, Russia's annexation of Crimea and the downing of passenger flight MH17.

To avoid dependency on foreign natural resources by both the Netherlands and the EU as a whole, the Advisory Council on International Affairs (AIV) has suggested that a more integrated EU energy policy is needed to minimise the security risks.⁴⁷⁴ This could curb some of the risks of, for instance, Russia using energy supply as leverage in political relations. In addition, the other major oil- and natural-gas-producing countries that export to the Netherlands are prone to instability, which could ultimately translate to national security risks.⁴⁷⁵

Another mitigation strategy would be to become less dependent on fossil fuel resources. But despite the fact that the Energy Agreement of 2013⁴⁷⁶ sets targets for renewable energy consumption at 16 per cent for 2023, in the coming decade oil and gas will remain major sources for the supply of energy, so the Netherlands will stay dependent on external sources. Another major development is the transition to a low-carbon energy supply in 2050, as stipulated in the Dutch energy agenda.⁴⁷⁷

4.4.4. The Dutch agricultural sector as an important enabler for economic activity and security

The economic security of the Netherlands relies on the sound performance of Dutch agriculture and food production. Although processes within the agriculture and food production sector are not singled out as 'critical processes', their disruption could create considerable societal disruption. An illustrative case is the 2011 Arab Spring protests, which arose as a result of – among other reasons – price spikes in imported grain crops due to a wave of drought and heatwaves in 2010, which negatively affected the volume of grain production for the global market.⁴⁷⁸

⁴⁷² Wemer (2018).

⁴⁷³ Adviesraad Internationale Vraagstukken (AIV) (2014).

⁴⁷⁴ Adviesraad Internationale Vraagstukken AIV (2014).

⁴⁷⁵ Van Esch et al. (2014).

⁴⁷⁶ Sociaal-Economische Raad SER (2013).

⁴⁷⁷ Ministry of Economic Affairs (2017).

⁴⁷⁸ Sternberg (2014).

The Dutch agro-food sector is one of the driving forces of the economy of the Netherlands, and represents an important share of the overall Dutch economy in terms of value added. Internationally, the Dutch agro-food sector is also of significance. The Netherlands is the world's second-largest exporter of agricultural products and one of the world's leading producers of vegetables and fruit.⁴⁷⁹ As noted earlier in this section, a large portion of biomass products consumed domestically consists of potatoes that are also domestically extracted. However, soy beans, for instance, need to be imported for animal feed.⁴⁸⁰ Therefore, the supply of soy (in the form of beans, oil or meal) can be seen as being of strategic importance as major players in the beef cattle, livestock and food-processing industry in the Netherlands depend on imports of soy. Their activities account for an estimated 7 per cent of Dutch GDP.⁴⁸¹

Import dependence makes these industries vulnerable to geopolitical developments that may affect supply of this commodity. Soy supply and demand are influenced by several global trends, including population growth, urbanisation, climate change and economic development. Population growth combined with economic growth leads to increased consumption of meat, leading to greater demand for soy. Climate change reduces soybean yields and makes water increasingly scarce.⁴⁸² Water can become a potentially limiting factor to increased soy production, especially since urbanisation in producing countries spurs demand for drinking water in megacities. The soy demand from China and emerging economies is rapidly growing, which may result in increasing competition over available soy supplies, even though it is not expected that global demand for soy will outweigh supply in the near future.⁴⁸³ Also, producing countries, especially in Latin America, are vulnerable to social and political instability, which may be ignited by factors related to soy production, such as changes in land and water use or environmental degradation.

4.4.5. Strategic approaches for managing the trade-offs between cost-effective access to natural resources and potential security risks

From an economic perspective, access to raw materials is fundamental to support the healthy functioning of industrial and agricultural sectors in the Netherlands. Finding the right sources for these raw materials includes not only considerations about access, quality, reliability and speed of supply, but also an assessment of costs that arise from security risks linked to potential supply disruptions, unpredictable price increases or other risk factors highlighted above. These trade-offs can be managed in different ways, some of which may include:

- Reducing the demand for certain resources by making the production, consumption or processing of them more efficient. This can be done by stimulating domestic R&D, both in refining existing processes as well as identifying new processes; and regulating the use of more efficient technologies – for example, by means of subsidies or restrictions.

⁴⁷⁹ Rintoul (2019).

⁴⁸⁰ Pol-de Jongh et al. (2016).

⁴⁸¹ Ridder et al. (2013).

⁴⁸² Elferink & Schierhorn (2016), Ridder et al. (2015).

⁴⁸³ Ridder et al. (2015).

- Diversifying sources of supply, in other words, increasing the supply from other sources or from substitute resources. This can be done by supporting producing countries in the development of new sources, or by stimulating the use of technologies that are more dependent on other sources.
- Guaranteeing supply in the form of developing strategic reserves, protecting sea lines of communication and building up preferential supply relationships.
- Influencing a more balanced distribution through economic and international diplomacy, lowering trade barriers and insisting on global rules of the game.

4.5. Summary

The situation and developments described above demonstrate a variety of effects that the economy and national security have on each other, and identify where specific risk vectors may have direct relevance to the Netherlands, given the unique characteristics of the Dutch economy. In terms of the policy options open to the Dutch government to address some of the risks discussed above, these vary significantly across the different risk vectors. In the case of allowing foreign investments or allowing international students and skilled workers to enter into critical sectors, the Dutch government has greater power and influence to determine whether and under which conditions these flows can happen. If these conditions can be made clear, alternative options are often still available. In the case of raw materials and natural resources, especially when concentrated in specific regions – as is the case in rare earth materials – an alternative is much harder to find. Longer term solutions, for instance by stimulating innovation, are often required in these circumstances instead.

The research and education system, as well as the broader economy, in the Netherlands is characterised by openness and free flow of products, services, and knowledge, and any restriction in these systems is often perceived as damaging in the public discourse.⁴⁸⁴ The concerns that have been highlighted in this chapter emerge in relation to what should be seen as a limited part of these systems. Security risks arising from economic activity are raised in relation to areas where control and influence could be gained over interests that are public, strategic or labelled as ‘critical’. Inevitably, in these areas, policymakers will face a number of trade-offs between economic and other benefits, versus measures focused on minimising security risks. At the same time, it is virtually impossible to draw up a workable *ex-ante* distinction between where an economic interest ends and a national security interest starts.

To complicate matters further, any such discussions around these trade-offs are often linked with wider (politicised) debates in society, such as those concerning national sovereignty, European integration and decision-making, foreign policy, migration and others. Also, there is a danger that discussions of trade-offs assume that any loss of control and independence is always negative. This neglects the fact that, even in critical sectors, different forms of fruitful collaboration can take place that could help sustain critical capabilities, while minimising national security risks. For example, under the framework of the Lancaster

⁴⁸⁴ See, for example the government letters to Parliament concerning supervision on students from potentially higher risk countries: Tweede Kamer der Staten-Generaal (2019).

House Treaties, France and the UK have been able to retain critical defence capabilities (e.g. advanced missile capabilities), albeit no longer retaining the full spectrum of sovereign capabilities, but rather creating a situation of mutual dependency.

5. Conclusion

The interconnections between national security and the economy have grown as globalisation and economic integration have increased over the last decades. For open economies like the Netherlands, these interconnections manifest themselves both as opportunities and possible threats to its national security (as shown in more detail in Chapter 4). In this chapter, we summarise the key findings of the research, structured around the research questions shown below (as introduced in Chapter 1).

| Research questions | |
|--------------------|--|
| 1 | How can national security be defined and what does the international literature suggest about its main components? |
| 2 | What can be learned from the (academic) literature about the relationship(s) between the economy of a country and the various aspects of national security? Which factors, mechanisms and underlying causal mechanisms can be identified and what is known about the strength of these causal relations? |
| 3 | What is the impact of contextual, country-specific characteristics and factors on this relationship? |
| 4 | What do the answers to research questions 2) and 3) tell us about the factors and characteristics that have an impact on the interconnections between the Dutch economy and its national security? |
| 5 | How does the Netherlands perform with regard to these economic factors, which trends or developments can we identify, and what do they mean for the national security of the Netherlands? |

5.1. RQ1: How can national security be defined and what does the international literature suggest about its main components?

While the academic and policy understandings of national security have been subject to change, there is increasing recognition of the importance of economic security and resilience of critical sectors. Overall, the economy cannot be easily separated from national security; the relationship between these two spheres is complex and characterised by many close interconnections and feedback loops, which creates challenges when it comes to conceptualising national security in a succinct manner. Understandings of national security have evolved over time, and have been shaped and influenced by theoretical interpretations of international relations as well as historical events and trends. In broad terms, stability, safety, protection and freedom from fear, threat and conflict are considered as some of the core themes that the policy and academic literature examines when defining national security.

Security can also be defined in terms of the values that people hold, with physical safety, economic welfare, autonomy, access to information and psychological well-being as examples. Prior to the Cold

War, the traditional notion of security revolved around realist explanations of state actions and the nature of international conflict.⁴⁸⁵ Since the end of the Cold War, there has been a growing literature looking to expand the scope of security to better account for globalisation and wider trends following the end of the bipolar struggle for power – as perceived by the realists. Many of these aspects focus less on the state and conflict, and more on the threats and risks that are faced by individual people – expanding to include areas such as crime, health, environmental concerns and economic security. As such, national security becomes interconnected with preventing disruptive effects on society (e.g. protecting its economic performance and critical processes, such as democratic elections and others). These ideas are gradually making their way onto the security agenda in the policy domain, with international organisations and national governments alike incorporating them into their own concepts and strategies. Overall, definitions of national security have an important economic dimension and the economy cannot be easily separated from national security. The relationship between these two spheres is complex and characterised by many close interconnections and feedback loops. It is therefore inherently challenging to construct a fully comprehensive conceptual framework that captures all of the main components of national security. In the context of the work of NCTV and for the purposes of this study, therefore, we have focused on precisely those aspects of national security which relate to the protection of critical infrastructure, sectors and processes that are vital for the sustainable functioning of [Dutch] society.

5.2. RQ2: What can be learned from the literature about the relationship(s) between the economy of a country and the various aspects of national security? Which factors, mechanisms and underlying causal mechanisms can be identified?

Academic, policy and grey literature sources cite a number of economically related risks to critical infrastructure, sectors and processes that merit the consideration of policymakers. Drawing on this evidence, the study team has developed a framework that maps potential threats to national security from economic factors by means of ‘risk vectors’. These risk vectors highlight the avenues through which the interaction between the components of ‘the economy’ and ‘national security’ takes place. They include: ownership, espionage and access to sensitive information, natural resource dependence, supplier dependence, government intervention, corruption and fraud, and socio-economic inequality. In addition, literature shows that a number of global economic and geostrategic trends could also present risk factors to critical infrastructure, sectors and processes and therefore should be considered alongside an analysis of risk vectors. These trends include: digital transformation and the implementation of industrial IoT, globalisation and interdependence, EU economic trends, the political and economic paradigm of foreign states, uncertainty in relation to resource security, and potential concerns with regard to information integrity and trustworthiness.

⁴⁸⁵ Burgess (2007).

Underpinned by macroeconomic variables and economic developments, the risk vectors stem from the economic activity but involve the potential presence of *malicious intent* behind such activity. If the malicious intent is or becomes present, the *risk* becomes a *threat* to national security.

A range of complex interactions of varying strengths exist between different risk vectors, their underpinning drivers and the global economic and geostrategic environment. This study has considered the strategic picture of macroeconomic variables and events, and the avenues (risk vectors) through which they may impact critical infrastructure, sectors and processes as a sub-set of means by which a state can guarantee national security to its citizens. These relationships are illustrated through an analytical map, presented in Figure 5.1.

Figure 5.1. Proposed analytical map of risk vectors through which the economy can affect critical infrastructure, sectors and processes



Source: RAND Europe analysis

5.3. RQ3: What is the impact of contextual, country-specific characteristics and factors on this relationship?

Contextual and country-specific factors will have a bearing on how the different risk vectors may manifest themselves, as well as the degree to which each vector is important for any particular critical sector. While there is much similarity in the conceptualisation of critical infrastructures, sectors and processes by different countries – for example, a shared focus on sectors such as energy finance, food and transport (see Chapter 3) – there are also important differences in the size of these sectors, the level of government ownership, privatisation and regulation of these in different countries. Countries with a greater focus on deregulation and free-market economic principles, such as the UK, may be more open to private sector provision of some critical services and processes (e.g. in the telecommunications sector, energy, rail transportation, airports), while countries with a greater level of state intervention in the economy, such as China and Russia, retain a higher degree of state monopoly over critical sectors and processes. In some areas, however, due to the presence of market failures or due to high levels of national security concerns – or both – state ownership of critical sectors is preferred (e.g. in the nuclear energy sector or provision of healthcare). Generally speaking, private sector influence in critical sectors and processes, such as political institutions and elections, is viewed as a potential security risk.

Additionally, the level of exposure to the individual risk vectors will depend on the nature of the economy and the broader integration of the state in question in regional and global structures. The impact of individual risk vectors is also likely to be partially determined by the type of capitalist economy of the state (e.g. liberal market economy or coordinated market economy). The Netherlands, for example, with its tight interconnectedness with the EU – through trade (including high volumes of transport and interconnected supply chains), the currency union and political and governance structures – is more likely to be immediately affected by EU economic trends and developments than countries outside of the EU (or even outside the Eurozone), whose portfolio of trade partners may be more diverse, as may be their geographic and political distance from the EU. European economic integration may also expose a state to risk vectors by creating tensions between EU-level macroeconomic policy and domestic-level social policies. In practice the former is likely to supersede the latter which may exacerbate socio-economic inequality; this poses a risk to a country's internal stability and the well-being of its citizens. On an operational level, endogenous factors – such as the proportion of foreign ownership of companies in critical sectors, presence of skills gaps or insufficient R&D and innovation in critical sectors – may also make a country more exposed to the risks of becoming reliant on foreign suppliers of critical products and services, who could exhibit malicious intent and thus pose a threat to national security.

5.4. RQ4: What do the answers to research questions 2) and 3) tell us about the factors and characteristics that have an impact on the interconnections between the Dutch economy and its national security?

The Netherlands is a relatively small nation in land surface, but with a gross domestic product (GDP) of 830 billion US Dollar (€738 billion) it is the world's 18th largest economy. The Dutch economy is also

deeply integrated within the EU, both politically and economically. High reliance on international trade is likely to expose a country to global and regional trends more acutely, due to the increased interconnectedness with other countries and regions through trade relationships. In the Netherlands, such a degree of reliance on international trade is also visible specifically within critical sectors. The level of restriction on FDI in the Netherlands is uniformly low, including in sectors contributing to vital processes. While this openness brings great opportunities for economic growth, technology transfer, information exchange and international collaboration, FDI can also present potential risks to national security, as it may facilitate access and control of critical sectors and processes by foreign actors with malicious intent. Such concerns have been subject to significant attention from the Dutch government and the general public, for example, as witnessed in public discussions on the KPN acquisition case or the current Huawei 5G debate (see Boxes 2, 7, 8 for detail).

In the Netherlands, and across Europe more widely, there is an identified need for increased digital literacy in order to combat the spread of online disinformation that can distort the outcome of critical processes. The Netherlands is also experiencing continued skills gaps in STEM and ICT skills, particularly in contrast to the EU averages in supply of these skills, which may present a national security risk in terms of critical sectors' ability to recruit and retain talent to enable their successful functioning. While the Netherlands is a welcoming destination to a high proportion of international students in technical disciplines, if domestic talent is not grown and developed, the Netherlands may need to rely on foreign suppliers of critical processes.

Finally, there are some areas where the Netherlands is heavily reliant on imports of raw materials, for example crude oil, metals and rare earth minerals, making it more exposed to risks and uncertainty around resource supply. It is important to note, however, that there are also areas where the Netherlands is self-sufficient in resource extraction and can satisfy most, if not all, of domestic consumption from domestically extracted materials (e.g. much of biomass products such as potatoes and natural gas). Here, the national security risk linked to resource dependence is limited.

5.5. RQ5: How does the Netherlands perform with regard to these economic factors, which trends or developments can we identify, and what do they mean for the national security of the Netherlands?

Based on the unique characteristics of the Dutch economy, the following risk vectors have been identified by the study team as presenting particularly relevant potential security risks:

- The relationship between foreign ownership and investments in critical infrastructure, products, and services, and the changing economic and political paradigms that occur as a consequence of economic and political power shifts in the international system.
- The skills and technology gaps that are appearing in the Dutch economy as a consequence of an aging population and the increased demand for specialist skills and critical thought due to the digital transformation occurring in societies and economies across the world.

- The future energy, food and resource needs of the Dutch society and economy and the location of the extraction of the raw materials for these resources in the context of climate change and energy transition trends.

As highlighted in section 4.5, the performance of the Netherlands in relation to these economic variables (such as low FDI regulation, technical skills gaps and need for increased digital literacy, and heavy reliance on imports of raw materials) means that the risk vectors may constitute security threats if not managed effectively. As a result of these risk vectors, Dutch policymakers face a number of trade-offs in terms of managing the potential national security risks resulting from economic activities. These trade-offs comprise:

- The need to balance commercial benefits (for example, access to better and cheaper technological solutions) with security risks (for example, the threat of accessing and abusing sensitive information to which a foreign provider of goods or services could gain access, or that could be used to distort democratic decision-making processes).
- The need to balance the benefits of international research collaboration and exchange of skills and talent with the need to secure a pipeline of domestic talent to work in critical sectors/processes.
- The need to balance cost-effective access to resources with potential security risks related to the country of origin of imported resources, secure supply of resources or other risks of disruption or interference, for example the influence of private actors in political processes.

To inform the analysis of trade-offs in relation to specific economic activities – such as FDI, trade or skills imports – a range of questions can be considered to better understand the nature of the security risk presented by economic activity in critical sectors/processes. As presented in Table 4.3 of this report, these questions should examine: the vulnerabilities of the sector in question and the costs to the Netherlands if the vulnerability is exploited; the nature of the threat posed; and the likely security consequences if the threat were to materialise. Applying these questions to the Netherlands' critical sectors, infrastructure and processes may allow for a more complete understanding, and subsequent management of, the nature of the risks posed by economic activities to national security.

References

- Adler, Emmanuel. 2005. 'Barry Buzan's use of Constructivism to reconstruct the English School: Not all the way down.' *Journal of International Studies* 34(1). As of 20 September 2019: <https://journals.sagepub.com/doi/pdf/10.1177/03058298050340011701>
- Adviesraad Internationale Vraagstukken (AIV). 2014. *De EU-gasafhankelijkheid van Rusland: hoe een geïntegreerd eu-beleid dit kan verminderen*. Den Haag: Adviesraad Internationale Vraagstukken.
- . 2019. 'China en de strategische opdracht voor Nederland in Europa.' As of 14 August 2019: <https://aiv-advies.nl/download/b521a6c9-1f46-4a68-a47c-da7b3ebb9f9f.pdf>
- Advisory Council for Science and Technology Policy (AWT). 2012. 'China's extended hand: How Chinese and Dutch knowledge can strengthen each other.' As of 14 August 2019: <https://www.awti.nl/binaries/awti/documenten/adviezen/2012/3/23/de-chinese-handschoen---engels/a78uk.pdf>
- Altman, S., Ghemawat, P., Bastian, P., 2018. 'DHL Global Connectedness Index 2018. The State of Globalization in a Fragile World.' As of 19 May 2019: <https://www.logistics.dhl/content/dam/dhl/global/core/documents/pdf/glo-core-gci-2018-full-study.pdf>
- Altwickler, Tilmann. 2018. 'Transnationalizing Rights: International Human Rights Law in Cross-Border Contexts.' *European Journal of International Law* 29(2). As of 29 October 2019: <https://doi.org/10.1093/ejil/chy004>
- Amiti, Mary, Stephen J. Redding and David Weinstein. 2019. 'The Impact of the 2018 Trade War on U.S. Prices and Welfare.' *CEP Discussion Paper No 1603*. London: Centre for Economic Performance. As of 2 September 2019: <http://cep.lse.ac.uk/pubs/download/dp1603.pdf>
- Ams-ix. 2019. 'Who we are.' As of 17 May 2019: <https://www.ams-ix.net/ams/about-ams-ix>
- Anand, Sudhir, & Amartya Sen. 1994. 'Human Development Index: Methodology and Measurement.' New York: Human Development Report Office Occasional Papers.
- Anderson, Ross, and Shailendra Fuloria. 2010. 'Security economics and critical national infrastructure.' *Economics of Information Security and Privacy*. Springer, Boston, MA. Conference proceedings, 55–66.
- van Apeldoorn, Bastiaan and Laura Horn. 2018. 'Critical Political Economy.' KFG Working Paper 87. As of 20 September 2019: https://www.polsoz.fu-berlin.de/en/v/transmeurope/publications/working_paper/wp/wp87/WP_87_Apeldoorn_Horn_Web.pdf

- Ashford, Warwick. 2011. 'Is UK Critical National Infrastructure Properly Protected?' *Computer Weekly*. As of 22 September 2019: <http://www.computerweekly.com/news/1280097313/Is-UK-critical-national-infrastructure-properly-protected>
- Australian Government. 2010. 'Critical Infrastructure Resilience Strategy'. As of 7 November 2019: <https://www.tisn.gov.au/Documents/Australian+Government+s+Critical+Infrastructure+Resilience+Strategy.pdf>
- Australian Government. 2012. 'Australia in the Asian Century.' As of 21 January 2019: https://www.defence.gov.au/whitepaper/2013/docs/australia_in_the_asian_century_white_paper.pdf
- Australian Government. 2013. 'Strong and Secure: A Strategy for Australia's National Security.' As of 8 January 2019: <https://www.files.ethz.ch/isn/167267/Australia%20A%20Strategy%20for%20National%20Security.pdf>
- Bahgat, Gawdat. 2006. 'Europe's energy security: challenges and opportunities.' *International Affairs* 82(5): 961–75.
- Bailey, D., McCann, P., Ortega-Argiles, R. 2018. 'Could Brexit Spell The End For "Just In Time" Production?' *Prospect*. 5 April 2018. As of 17 May 2019: <https://www.prospectmagazine.co.uk/economics-and-finance/could-brexit-spell-the-end-for-just-in-time-production>
- Baldwin, David. 1995. 'Security Studies and the End of the Cold War.' *World Politics* 48(1): 117–41.
- . 1997. 'The concept of security.' *Review of International Studies* 23(1): 5–26.
- Bar-El, Ronen, Eyal Pecht & Asher Tishler. 2018. 'Human Capital and National Security.' *Defence and Peace Economics* 1–21.
- Bastein, Ton and Elmer Rietveld. 2015. 'TNO 2015 R11613: Materials in the Dutch Economy - A vulnerability analysis.' As of 29 October 2019: <https://www.fme.nl/sites/default/files/afbeeldingen/TNO%202015%20R11613%20Materials%20in%20the%20Dutch%20Economy.pdf>
- Baylis, John, Steve Smith & Patricia Owens. 2017. 'The Globalization of World Politics: An introduction to international relations.' Oxford University Press.
- BBC. 2018. 'How the Dutch foiled Russian 'cyber-attack' on OPCW.' 4 October. As of 16 May 2019: <https://www.bbc.co.uk/news/world-europe-45747472>
- . 2019a. 'Trade wars, Trump Tariffs and Protectionism explained.' 10 May. As of 17 May 2019: <https://www.bbc.com/news/world-43512098>
- . 2019b. 'Huawei: Chinese Government Doesn't Control Us.' 14 May. As of 18 May 2019: <https://www.bbc.com/news/av/uk-48267350/huawei-chinese-government-doesn-t-control-us>

- BBC News. 2018. 'Cambridge Analytica: The firm's global influence.' As of 22 September 2019: <https://www.bbc.com/news/world-43476762>
- . 2019. 'US lifts steel and aluminium tariffs on Canada.' As of 22 September 2019: <https://www.bbc.com/news/business-48309703>
- Beaufre, André. 1965. *Deterrence and Strategy*. New York: Praeger.
- Bergema, Reinier, Erik Frinking, Karlijn Jans, Paul Sinning, Tim Sweijs & Alice van de Bovenkamp. 2017. *Grote bewegingen, grote impact: Eerste verkennende studie naar belangrijke trends en maatschappelijke vraagstukken voor de politie*. The Hague: The Hague Centre for Strategic Studies.
- Van Bergeijk, Peter, Frans-Paul van der Putten, Jan Rood & Minke Meijnders. 2015. 'Geopolitics and economic vulnerability.' *Clingendael Monitor 2015*. The Hague: Clingendael Institute.
- Bilgin, Pinar. 2008. 'Critical Theory.' In *Security Studies: An Introduction*, Edited by Paul D. Williams. New York: Routledge.
- Birol, Fatih. 2019. 'Oil 2019: Analysis and forecasts to 2024.' International Energy Agency (IEA). As of 15 August 2019: <https://www.iea.org/oil2019/>
- Blackhat. 2017. 'The 2017 Black Hat Europe Attendee Survey: The Cyberthreat in Europe.' As of 16 May 2019: <https://www.blackhat.com/docs/eu-17/Black-Hat-Attendee-Survey.pdf>
- Blanchard, Jean-Marc F., Edward D. Mansfield & Norrin M. Ripsman. 1999. 'The Political Economy of National Security: Economic statecraft, interdependence, and international conflict.' *Security Studies* 9: 1–14.
- Boot, M. & M. Bergmann. 2019. 'Defending America From Foreign Election Interference.' Council on Foreign Relations, 6 March. As of 16 May 2019: <https://www.cfr.org/report/defending-america-foreign-election-interference>
- Booth, Ken. 1991. 'Security and Emancipation.' *Review of International Studies* 17(4): 313–26.
- Bosworth, Derek; Clare Lyonette and Rob Wilson. 2013. 'The supply of and demand for high-level STEM skills.' *Institute for Employment Research*. As of 14 August 2019: https://assets.publishing.service.gov.uk/government/uploads/system/uploads/attachment_data/file/302973/evidence-report-77-high-level-stem-skills_1_.pdf
- Breland, Ali. 2018. 'Congressional panel warns of national security threat from Chinese tech.' *The Hill*. As of 16 May 2019: <https://thehill.com/policy/technology/416637-congressional-advisory-panel-warns-of-national-security-threat-of-chinese>
- Bremmer, Ian. 2009. 'State Capitalism Comes of Age-The End of the Free Market.' *Foreign Affairs* 88(3):40.
- Brennan, Hannah, Amy Kapczynski, Christine H. Monahan, and Zain Rizvi. 2016. 'A prescription for excessive drug pricing: leveraging government patent use for health.' *Yale JL & Tech.* 18: 275.
- Brown-Keyder, V. 2007. 'Intellectual property: Commodification and its discontents.' In *Reading Karl Polanyi for the Twenty-First Century*, Bugra, A. & K. Agartan. 155–170. New York: Palgrave Macmillan.

- Bulten, C.D.J., B.J. de Jong, E.J. Breukink & A. Jettinghoff. 2017. *Vitale Vennootschappen In Veilige Handen* [Vital Companies in Safe Hands]. Radboud Universiteit. As of 16 May 2019: https://www.wodc.nl/binaries/2609_Volledige_Tekst_tcm28-250320.pdf
- Bundesamt für Verfassungsschutz (BvF). N.d. 'Protection against industrial espionage'. As of 7 November 2019: <https://www.verfassungsschutz.de/en/public-relations/publications/publications-protection-against-industrial-espionage>
- Burgess, Peter J. 2007. 'Non-military Security Challenges.' In *Contemporary Security Strategy*, edited by Craig A. Snyder, 60–78. London: Palgrave.
- Burkhardt, Joanna M. 2017. 'Combating Fake News in the Digital Age.' *Library Technology Reports*, 53.8: 1–33.
- Bussière, Matthieu, Perez-Barreiro, Emilia, Straub Roland, Taglioni, Daria. 2010. 'Protectionist Responses to the Crisis: Global Trends and Implications.' European Central Bank. Occasional Paper Series, No 110. As of 17 May 2019: <https://www.ecb.europa.eu/pub/pdf/scpops/ecbocp110.pdf?a9e5d9a3d7fab9edc635261bb6dcb1de>
- Buzan, Barry. 1997. 'Rethinking Security After the Cold War.' *Cooperation and Conflict* 32(1): 5–28.
- . 2008. *People, States & Fear: An agenda for international security studies in the post-cold war era*. Colchester: ECPR Press.
- Buzan, Barry, & Lene Hansen. 2009. *The Evolution of International Security Studies*. Cambridge: Cambridge University Press.
- Buzan, Barry, Ole Waever & Jaap de Wilde. 1998. *Security: A New Framework for Analysis*. London: Lynne Rienner Publishers. As of 29 October 2019: https://www.rienner.com/title/Security_A_New_Framework_for_Analysis
- Cabinet Office. 2017. 'Public Summary of Sector Security and Resilience Plans.' As of 26 April 2019: https://assets.publishing.service.gov.uk/government/uploads/system/uploads/attachment_data/file/678927/Public_Summary_of_Sector_Security_and_Resilience_Plans_2017__FINAL_pdf__002_.pdf
- Cadwalladr, Carole. 2018. 'The Cambridge Analytica Files.' *The Guardian*. As of 22 September 2019: http://davelevy.info/Downloads/cabridgeanalyticafiles%20-theguardian_20180318.pdf
- Canadian Association of Petroleum Producers (CAPP). 2019. 'Crude oil forecast.' As of 15 August 2019: <https://www.capp.ca/publications-and-statistics/crude-oil-forecast>
- Carr, Edward Hallett. 1940. *The Twenty Years' Crisis: 1919–1939: An Introduction to the Study of International Relations*. London: Macmillan and Co., Limited.
- C.A.S.E Collective. 2006. 'Critical Approaches to Security in Europe: A Networked Manifesto.' As of 20 September 2019: <https://journals.sagepub.com/doi/10.1177/0967010606073085>
- CBS. 2012. 'Most raw materials imported from Europe.' As of 29 October 2019: <https://www.cbs.nl/en-gb/news/2012/46/most-raw-materials-imported-from-europe>

- . 2018. 'Internationale handel; in- en uitvoerwaarde energie per drager, 1996-2018.' As of 29 October 2019: <https://opendata.cbs.nl/statline/#/CBS/nl/dataset/37333/table?dl=26F15>
- . 2019. 'Energy consumption down in 2018.' As of 15 August 2019: <https://www.cbs.nl/en-gb/news/2019/16/energy-consumption-down-in-2018>
- . 2019a. 'EU's share in Dutch exports has fallen slightly.' As of 29 October 2019: <https://www.cbs.nl/en-gb/news/2019/37/eu-s-share-in-dutch-exports-has-fallen-slightly>
- . 2019b. 'Internationale handel; invoer en uitvoer van diensten naar land, kwartaal.' As of 29 October 2019: <https://opendata.cbs.nl/statline/#/CBS/nl/dataset/82616NED/table?dl=23591>
- Centre for the Protection of National Infrastructure. 2019. 'Critical National Infrastructure.' As of 25 April 2019: <https://www.cpni.gov.uk/critical-national-infrastructure-0>
- Centre on Regulation in Europe. 2019. 'Cybersecurity: safeguarding Europe's essential infrastructure.' As of 16 May 2019: <http://www.cerre.eu/events/cybersecurity-safeguarding-europe%E2%80%99s-essential-infrastructure>
- Cerny, Philip. 1990. *The changing architecture of politics: Structure, agency and the future of the state*. London: Sage Publications.
- . 1995. 'Globalisation and the Changing Logic of Collective Action.' *International Organization*. 49(4): 595–625.
- Cerny, Philip and Alex Pritchard. 2017. 'The new anarchy: Globalisation and fragmentation in world politics.' *Journal of International Political Theory* 13(3). As of 20 September 2019: <https://journals.sagepub.com/doi/10.1177/1755088217713765>
- Chatzky, Andrew. 2019. 'The truth about tariffs.' *Council on Foreign Relations*. As of 22 September 2019: <https://www.cfr.org/background/truth-about-tariffs>
- Christensen, Guillermo, Alejandro Fiuza & Harrison Freeman. 2018. 'Alert: Foreign Investment into U.S. Now Subject to Broader National Security Reviews: Heightened Need to Consider CFIUS Risks.' *Brown Rudnick*. As of 23 April 2019: <http://www.brownrudnick.com/wp-content/uploads/2018/11/Brown-Rudnick-Alert-Foreign-Investment-into-U.S.-Now-Subject-to-Broader-National-Security-Reviews.pdf>
- Chung, John J. 2017. 'Critical Infrastructure, Cybersecurity, and Market Failure.' *Oregon Law Review*. 96: 441.
- Cleary Gottlieb. 2018. 'UK Government Proposes National Security and Investment Regime.' As of 16 May 2019: <https://www.clearygottlieb.com/-/media/files/alert-memos-2018/uk-government-proposes-national-security-and-investment-regime.pdf>
- Clingendael. 2019. 'Economic Security: Methodology and Approach.' As of 29 October 2019: https://www.clingendael.org/sites/default/files/2019-04/GSP_Economic_Security_Methodology_Paper.pdf
- Comfort, Louise, Ben Wisner, Susan Cutter, Roger Pulwarty, Kenneth Hewitt, Anthony Oliver-Smith, John Wiener, Maureen Fordham, Walter Peacock & Fred Kringgold. 1999. 'Reframing disaster

- policy: the global evolution of vulnerable communities.' *Global Environmental Change Part B: Environmental Hazards* 1(1): 39–44.
- Commission of the European Communities. 2006. 'Communication from the Commission on a European Programme for Critical Infrastructure Protection.' As of 19 May 2019: <https://eur-lex.europa.eu/LexUriServ/LexUriServ.do?uri=COM:2006:0786:FIN:EN:PDF>
- Commission on Human Security. 2003. 'Human Security Now.' New York.
- Conrad, Björn and Genia Kostka. 2016. 'Chinese investments in Europe's energy sector: Risks and opportunities?' *Dahrendorf Forum*. As of 14 August 2019: <https://www.dahrendorf-forum.eu/publications/special-issue-chinese-investments-in-europes-energy-sector-risks-and-opportunities/>
- Constantinescu, M. 2014. 'The Economic Component of National Security—Current Issues.' *Acta Universitatis Danubius. Economica* 10(6).
- Crawford, Neta C. 1991. 'Once and future security studies.' *Security Studies* 1(2): 283–316.
- Cutler, A. Claire. 2001. 'Critical reflections on the Westphalian assumptions of international law and organization: a crisis of legitimacy.' *Review of International Studies* (27). As of 22 September 2019: <https://pdfs.semanticscholar.org/6f40/15029e0a6b94f408f3be9ee1dc224143c319.pdf>
- Dabla-Norris, Era, Kalpana Kochhar, Nujin Suphaphiphat, Frantisek Ricka and Evridiki Tsounta. 2015. 'Causes and Consequences of Income Inequality: A Global Perspective.' IMF Staff Discussion Note 15/13. As of 22 September 2019: <https://www.imf.org/external/pubs/ft/sdn/2015/sdn1513.pdf>
- Danish Defence Intelligence Service. 2017. 'Intelligence Risk Assessment 2017.' As of 8th January 2018: https://feddis.dk/SiteCollectionDocuments/FE/EfterretningsmaessigeRisikovurderinger/Risikovurdering2017_EnglishVersion.pdf
- Danish Security and Intelligence Service (PET). N.d. 'About PET'. As of 7 November 2019: <https://www.pet.dk/English/About%20PET.aspx>
- Danish Emergency Management Agency. 2013. 'National Risk Profile.' As of 25 April 2019: [https://brs.dk/viden/publikationer/Documents/National_Risk_Profile_\(NRP\)_-_English-language_version.pdf](https://brs.dk/viden/publikationer/Documents/National_Risk_Profile_(NRP)_-_English-language_version.pdf)
- Danish Government. 2018. 'Foreign and Security Policy Strategy 2019-2020.' As of 21st January 2018: <http://um.dk/-/media/UM/Danish-site/Documents/Udenrigspolitik/Aktuelle%20emner/Udenrigs%20og%20sikkerhedspolitik/2019-20/Foreign%20and%20security%20policy%20strategy%202019-2020.pdf>
- Davis, C.A., O. Varol, E. Ferrara, A. Flammini, & F. Menczer. 2016. 'BotOrNot: A system to evaluate social bots.' Developers Day Workshop at World Wide Web Conference (Montreal). As of 20 August 2018: <https://arxiv.org/abs/1602.00975>

- Deighton, Ben. 2017. 'Critical infrastructures under daily attack – ERNCIP head Georg Peter.' *Horizon Magazine*. As of 16 May 2019: https://horizon-magazine.eu/article/critical-infrastructures-under-daily-attack-erncip-head-georg-peter_en.html
- Delahaye, Roel and Oscar Lemmers. 2012. 'Most raw materials imported from Europe.' CBS News. As of 29 October 2019: <https://www.cbs.nl/en-gb/news/2012/46/most-raw-materials-imported-from-europe>
- Department of Digital Culture, Media and Sport. 2019. 'Disinformation and "fake news": Final Report.' UK Parliament. As of 22 September 2019: <https://www.parliament.uk/business/committees/committees-a-z/commons-select/digital-culture-media-and-sport-committee/news/fake-news-report-published-17-19/>
- Department of Justice. 2017. 'Charter Statement – Bill C-59: An Act respecting national security matters.' As of 29 October 2019: <https://www.justice.gc.ca/eng/csj-sjc/pl/charte-charte/ns-sn.html>
- De Beer, Paul. 2018. 'The erosion of the Polder model'. *Mens en maatschappij* 93 (3). As of 7 November 2019: <https://www.ingentaconnect.com/content/aup/mem/2018/00000093/00000003/art00003>
- De Staatssecretaris van Economische Zaken en Klimaat. 2017. 'Memorie Van Toelichtin.' As of 14 August 2019: <https://www.rijksoverheid.nl/binaries/rijksoverheid/documenten/kamerstukken/2019/03/05/memorie-van-toelichting-bij-kamerbrief-over-wet-ongewenste-zeggenschap-telecommunicatie/memorie-van-toelichting-bij-kamerbrief-over-wet-ongewenste-zeggenschap-telecommunicatie.pdf>
- Duffield, Mark. 2001. *Global Governance and the New Wars: The Merging of Development and Security*. Zed Books.
- EACEA National Policies Platform. 2018. 'Media literacy and safe use of new media: Netherlands.' As of 22 September 2019: <https://eacea.ec.europa.eu/national-policies/en/content/youthwiki/68-media-literacy-and-safe-use-new-media-netherlands>
- The Economist. 2014. 'Not My Problem: Providing Incentives For Good Behaviour.' Special report. 10 July 2014. As of 17 May 2019: <https://www.economist.com/special-report/2014/07/10/not-my-problem>
- Elferink, Maarten and Florian Schierhorn. 2016. 'Global demand for food is rising. Can we meet it?' *Harvard Business Review*. As of 15 August 2019: <https://hbr.org/2016/04/global-demand-for-food-is-rising-can-we-meet-it>
- Elman, Colin. 2008. 'Realism.' In *Security Studies: An Introduction*, edited by Paul D. Williams. New York: Routledge.
- Van Esch, Joris, Sijbren de Jong & Marjolein de Ridder. 2014. 'No Blood for Oil?' The Hague: The Hague Centre for Strategic Studies (HCSS).
- European Centre for the Development of Vocational Training. 2016. 'Skill Shortage and Surplus Occupations in Europe.' As of 26 April 2019:

https://ec.europa.eu/epale/sites/epale/files/skill_shortage_and_surplus_occupations_in_europe.pdf

- European Commission. 2013. 'Commission Staff Working Document. On a new approach to the European Programme for Critical Infrastructure Protection. Making European Critical Infrastructures more secure.' SWD(2013)318 final.
- . 2017. 'Europe needs more leaders with strong technical skills.' 2 February 2017. As of 16 August 2019:
https://ec.europa.eu/growth/content/europe-needs-more-leaders-strong-technical-skills-0_en
- . 2017b. 'Commission Staff Working Document. Comprehensive Assessment of EU Security Policy. Accompanying the document: Communication From the Commission to the European Parliament, The European Council and The Council. Ninth progress report towards an effective and genuine Security Union.' SWD(2017) 278 final. {COM(2017) 407 final}.
- . 2018a. 'Communication from the Commission to the European Parliament, the Council, the European Economic and Social Committee and the Committee of The Regions – Tackling online disinformation: a European Approach.' As of 21 January 2019: <https://eur-lex.europa.eu/legal-content/EN/TXT/PDF/?uri=CELEX:52018DC0236&from=EN>
- . 2018b. 'A multi-dimensional approach to disinformation: Report of the independent High level Group on fake news and online disinformation.' As of 17 May 2019: <https://ec.europa.eu/digital-single-market/en/news/final-report-high-level-expert-group-fake-news-and-online-disinformation>
- . 2019a. 'Latest Business and Consumer Surveys.' As of 29 October 2019:
https://ec.europa.eu/info/business-economy-euro/indicators-statistics/economic-databases/business-and-consumer-surveys/latest-business-and-consumer-surveys_en
- . 2019b. 'Migration and Home Affairs: Critical infrastructure.' As of 16 May 2019:
https://ec.europa.eu/home-affairs/what-we-do/policies/crisis-and-terrorism/critical-infrastructure_en
- . 2019c. 'Competition: State Aid. An Overview.' As of 17 May 2019:
http://ec.europa.eu/competition/state_aid/overview/index_en.html
- . 2019d. 'European Economic Forecast.' As of 17 May 2019:
https://ec.europa.eu/info/sites/info/files/economy-finance/ip096_en.pdf
- . 2019e. 'EU Foreign Investment Screening Regulation Enters into Force.' As of 29 October 2019: https://europa.eu/rapid/press-release_IP-19-2088_en.htm
- European Parliament. 2013. 'Decision No. 1313/2013/EU of the European Parliament and of the Council of 17 December 2013 on a Union Civil Protection Mechanism.' As of 29 October 2019:
<https://eur-lex.europa.eu/legal-content/EN/TXT/?uri=CELEX%3A32013D1313>
- . 2015. 'Understanding propaganda and disinformation.' As of 19 August 2019:
[http://www.europarl.europa.eu/RegData/etudes/ATAG/2015/571332/EPRS_ATA\(2015\)571332_EN.pdf](http://www.europarl.europa.eu/RegData/etudes/ATAG/2015/571332/EPRS_ATA(2015)571332_EN.pdf)

- . 2019a. 'EU to scrutinise foreign direct investment more closely.' As of 26 April 2019: <http://www.europarl.europa.eu/news/en/press-room/20190207IPR25209/eu-to-scrutinise-foreign-direct-investment-more-closely>
- . 2019b. 'EU framework for FDI screening.' As of 7 May 2019: [http://www.europarl.europa.eu/RegData/etudes/ATAG/2019/633165/EPRS_ATA\(2019\)633165_EN.pdf](http://www.europarl.europa.eu/RegData/etudes/ATAG/2019/633165/EPRS_ATA(2019)633165_EN.pdf)
- . 2019c. 'Closer to the citizens, closer to the ballot. Eurobarometer Survey 91.1 of the European Parliament – A public opinion monitoring study.' April, 2019. As of 29 October 2019: <http://www.europarl.europa.eu/at-your-service/en/be-heard/eurobarometer/closer-to-the-citizens-closer-to-the-ballot>
- European Parliament News. 2019. 'MEPs adopt Cybersecurity Act and want EU to counter IT threat from China.' 12 March 2019. As of 19 May 2019: <http://www.europarl.europa.eu/news/en/press-room/20190307IPR30694/meps-adopt-cybersecurity-act-and-want-eu-to-counter-it-threat-from-china>
- European Union. 2019. 'Member Countries: Netherlands.' As of 29 October 2019: https://europa.eu/european-union/about-eu/countries/member-countries/netherlands_en
- Europol. 2015. 'EU Terrorism Situation & Trend Report (TE-SAT) 2015.' The Hague: European Police Office (Europol).
- . 2016a. 'EU Terrorism Situation & Trend Report (TE-SAT) 2016.' The Hague: European Police Office (Europol).
- . 2016b. 'Islamic State changing terror tactics to maintain threat in Europe'. As of 2 July 2018: <https://www.europol.europa.eu/newsroom/news/islamic-state-changing-terror-tactics-to-maintain-threat-in-europe>
- . 2017. 'EU Terrorism Situation & Trend Report (TE-SAT) 2017.' The Hague: European Police Office (Europol).
- Eurostat. 2019. 'EU imports of energy products: Recent statistics.' As of 15 August 2019: <https://ec.europa.eu/eurostat/statistics-explained/pdfscache/46126.pdf>
- Executive People. 2018. 'Overheid heeft meer zeggenschap over cryptografieafdeling van Fox-IT' ['The Government has more to say over takeover of Fox-IT']. As of 29 October 2019: <https://executive-people.nl/600932/overheid-heeft-meer-zeggenschap-over-cryptografieafdeling-van-fox-it.html>
- EY. 2014. 'Top 10 risks in telecommunications 2014.' As of 16 May 2019: [https://www.ey.com/Publication/vwLUAssets/EY_-_Top_10_risks_in_telecommunications_2014/\\$File/EY-top-10-risks-in-telecommunications-2014.pdf](https://www.ey.com/Publication/vwLUAssets/EY_-_Top_10_risks_in_telecommunications_2014/$File/EY-top-10-risks-in-telecommunications-2014.pdf)
- Farrell, Theo. 2002. 'Constructivist Security Studies: Portrait of a research program.' *International Studies Review* 4(1): 49–72.
- Fazekas, Mihaly and Bence Toth. 2018. 'The extent and cost of corruption in transport infrastructure: New evidence from Europe.' *Transportation Research Part A: Policy and Practice* (113).

- Federation of American Scientists. 1995. 'Annual Report to Congress on Foreign Economic Collection and Industrial Espionage.' As of 23 April 2019: <https://fas.org/sgp/othergov/indust.html>
- Fierke, K.M. 2017. 'Critical Theory, Security, and Emancipation.' *Oxford Research Encyclopedia of International Studies*. doi: 10.1093/acrefore/9780190846626.013.138
- Fjäder, Christian. 2014. 'The nation-state, national security and resilience in the age of globalisation.' *Resilience* 2(2). doi: 10.1080/21693293.2014.914771
- Flaherty, C. & W. Leal Filho. 2013. 'Energy security as a subset of national security', In *Global energy policy and security*. London: Springer.
- Fletcher, Alden. 2018. 'Foreign Election Interference in the Founding Era.' *Lawfare*, 25 October. As of 16 May 2019: <https://www.lawfareblog.com/foreign-election-interference-founding-era>
- Fouarge, D.(ed). 2018. 'De arbeidsmarkt naar opleiding en beroep tot 2022.' Research Centre for Education and the Labour Market, ROA. As of 29 October 2019: https://www.cmmbo.nl/assets/uploads/2017/12/ROA_arbeidsmarkt-2022.pdf
- Freedman, Lawrence. 2004. *Deterrence*. London: Polity Press.
- French General Secretariat for Defence and National Security. 2017. 'The Critical Infrastructure Protection in France.' As of 25 April 2019: <http://www.sgdsn.gouv.fr/uploads/2017/03/plaquette-saiv-anglais.pdf>
- French Government. 2017. 'Defence and National Security Strategic Review.' As of 26 April 2019: <https://espas.secure.europarl.europa.eu/orbis/document/defence-and-national-security-strategic-review-2017>
- Fukuyama, Francis. 1992. *The End of History and the Last Man*. New York: Free Press.
- Fung, Brian. 2019. 'How China's Huawei took the lead over U.S. companies in 5G technology.' *Washington Post*. 10 April 2019. As of 29 July 2019: https://www.washingtonpost.com/technology/2019/04/10/us-spat-with-huawei-explained/?utm_term=.004d1cae873a
- Goeconomics. 2019. 'The Variable Relationship Between Economics and Security.' *Lawfare*. As of 29 October 2019: <https://www.lawfareblog.com/geoeconomics-variable-relationship-between-economics-and-security>
- George, Alexander L and Richard Smoke. 1974. *Deterrence in American Foreign Policy: Theory and Practice*. New York: Columbia University Press
- German Federal Government. 2016. 'White Paper on German Security Policy and the Future of the Bundeswehr.'
- Glenster, Ann Kristin. 2017. 'Decrypting Apple: Making Technology Companies the Referees of Law Enforcement on Privacy.' *Harvard Journal of Law & Technology JOLT Digest*. As of 23 April 2019: <https://jolt.law.harvard.edu/digest/decrypting-apple-making-technology-companies-the-referees-of-law-enforcement-on-privacy>
- The Global Energy Talent Index. 2019. 'The Global Energy Talent Index Report 2019.' As of 17 May 2019:

- <https://cdn2.hubspot.net/hubfs/3277184/GETI/GETI%202019/Global%20Energy%20Talent%20Index%20-%20GETI%202019.pdf>
- Gómez, Oscar A., & Des Gasper. 2013. 'Human Security: A Thematic Guidance Note for Regional and National Human Development Report Teams.' United Nations Development Programme Human Development Report Office.
- Gov.uk. 2016. 'What the Government is doing to keep your energy bill down.' As of 25 April 2019: <https://www.gov.uk/government/publications/what-the-government-is-doing-to-keep-your-energy-bill-down/what-the-government-is-doing-to-keep-your-energy-bill-down>
- Government of Canada. 2009. 'Action Plan for Critical Infrastructure'. As of 7 November 2019: <https://www.publicsafety.gc.ca/cnt/rsrscs/pblctns/pln-crtcl-nfrstrctr/pln-crtcl-nfrstrctr-eng.pdf>
- Government of Canada. 2016. 'Guidelines on the National Security Review of Investments.' As of 22nd January 2018: <https://www.ic.gc.ca/eic/site/ica-lic.nsf/eng/lk81190.html>
- Government of France. 2008. 'The French White Paper on Defence and National Security.' As of 21st January 2019: https://web.archive.org/web/20130215233239/http://merln.ndu.edu/whitepapers/France_English2008.pdf
- Government of France. 2013. 'White Paper: Defence and National Security 2013.'
- Government of France. 2017. 'Defence and National Security Strategic Review 2017.'
- Government Offices of Sweden. 2017. 'National Security Strategy.' As of 8th January 2018: <https://www.government.se/4aa5de/contentassets/0e04164d7eed462aa511ab03c890372e/national-security-strategy.pdf>
- Graham, Carol, Shaojie Zhou, and Junyi Zhang. 2015. 'Happiness and Health in China: A Paradox of Progress.' *Brookings*. As of 27th January 2018: <https://www.brookings.edu/wp-content/uploads/2016/07/happiness-health-progress-china.pdf>
- Green, Mark. 2019. 'China's Debt Diplomacy.' *Foreign Policy*. 25 April 2019. As of 30 July 2019: <https://foreignpolicy.com/2019/04/25/chinas-debt-diplomacy/>
- Grevi, Giovanni. 2009. 'The inter polar world: a new scenario.' European Union Institute for Security Studies Occasional Papers: 79.
- Gros, D., Alcidi, C., Busse, M., Elkerbout, M., Laurentsyeve, N. and Renda, A., 2018. 'Global Trends to 2035 – Economy and Society.' European Parliamentary Research Service, Global Trends Unit. PE 627.126 – N.
- Gunnella, Vanessa and Lucia Quaglietti. 2019. 'The economic implications of rising protectionism: a euro area and global perspective.' *ECB Economic Bulletin* (3). As of 22 September 2019: https://www.ecb.europa.eu/pub/economic-bulletin/articles/2019/html/ecb.ebart201903_01-e589a502e5.en.html
- Guthrie, Susan, Catherine A. Lichten, Emma Harte, Sarah Parks, Steven Wooding, Jennie Corbett. 2017. 'Understanding researcher mobility: Perspectives from Academia.' RAND Corporation. As of 14

- August 2019: <https://www.rand.org/randeurope/research/projects/understanding-researcher-mobility.html>
- Gwynn, Maria. 2017. 'Susan Strange: Trade as a Secondary Structure'. In *Handelspolitik und Welthandel in der Internationalen Politischen Ökonomie*, edited by Holger Janusch. Springer. As of 20 September 2019: https://www.geg.ox.ac.uk/sites/geg.ox.ac.uk/files/2018-07/Susan%20Strange%20Review_Trade_MAGwynn.pdf
- Haftendorn, Helga. 1991. 'The Security Puzzle: Theory-Building and Discipline-Building in International Security.' *International Studies Quarterly* 35(1): 3-17.
- Hague Centre for Strategic Studies (HCSS). 2014. 'No blood for oil? Economic Security, Energy Security and the Military.' As of 15 August 2019: <https://hcss.nl/report/no-blood-oil>
- The Hague Online. 2008. 'TU Delft Refuses To Bar Iranian Students.' 7 January. As of 16 May 2019: <https://www.thehagueonline.com/news/2008/01/07/tu-delft-refuses-to-bar-iranian-students>
- The Hague Security Delta. 2015. 'Securing Critical Infrastructure in the Netherlands: Towards a National Testbed.' As of 29 October 2019: https://www.thehaguesecuritydelta.com/media/com_hsd/report/53/document/Securing-Critical-Infrastructures-in-the-Netherlands.pdf
- Halbert, D. 2016. 'Intellectual property theft and national security: Agendas and assumptions.' *The Information Society* 32(4), 256-268. As of 22 September 2019: <https://www.tandfonline.com/doi/full/10.1080/01972243.2016.1177762>
- Hall, P. & A. James. 2009. 'Industry structure and innovation in the U.K. defense sector.' *The Economics of Peace and Security Journal* 4(1). doi: <http://dx.doi.org/10.15355/epsj.4.1.23>
- Hall, P. & D. Soskice. 2001. *Varieties of Capitalism: The Institutional Foundations of Comparative Advantage*. Oxford: Oxford University Press. As of 22 September 2019: <https://scholar.harvard.edu/hall/publications/varieties-capitalism-institutional-foundations-comparative-advantage>
- Hama, Hawre. 2017. 'State Security, Societal Security, and Human Security.' *Jadavpur Journal of International Relations* 21(1). As of 20 September 2019: <https://journals.sagepub.com/doi/pdf/10.1177/0973598417706591>
- Hameiri, Shahar, & Lee Jones. 2013. 'The Politics and Governance of Non-traditional Security.' *International Studies Quarterly* 57(3): 462-73.
- Hanemann, Thilo, Mikko Huotari and Agatha Kratz. 2019. 'Chinese FDI in Europe: 2018 trends and impact of new screening policies.' As of 14 August 2019: <https://www.merics.org/en/papers-on-china/chinese-fdi-in-europe-2018>
- Harding, Luke. 2018. 'How Russian spies bungled cyber-attack on weapons watchdog.' *The Guardian*. 4 October. As of 16 May 2019: <https://www.theguardian.com/world/2018/oct/04/how-russian-spies-bungled-cyber-attack-on-weapons-watchdog>

- Harp, Derek and Bengt Gregory-Brown. 2014. 'IT/OT Convergence: Bridging the Divide'. *NexDefense*. As of 15 August 2019:
<https://ics.sans.org/media/IT-OT-Convergence-NexDefense-Whitepaper.pdf>
- Harries, Tim. 2008. 'Feeling Secure or Being Secure? Why it can seem better not to protect yourself against a natural hazard.' *Health, Risk and Society* 10(5): 479-90.
- Hashimzade, Nigar, Gareth Myles, and John Black. 2017. *Oxford Dictionary of Economics (Fifth Edition)*. Oxford: Oxford University Press. As of 15 August 2019:
<https://global.oup.com/academic/product/a-dictionary--of-economics-9780198759430?cc=us&lang=en&>
- Heinrich, Tobias, Tiolman Kuhn, Mark Powell, Geneva Forwood, Orion Berg & Sabine Kueper. 2019. 'New EU Foreign Direct Investment Regulation—Initial Steps towards Harmonized European Investment Controls.' White & Case. As of 7 May 2019:
<https://www.whitecase.com/publications/alert/new-eu-foreign-direct-investment-regulation-initial-steps-towards-harmonized>
- Hellendoorn, Elmar. 2016. 'Nederland moet visie formuleren op de eigen strategische economische belangen.' *Financieel Dagblad*, 18 November. As of 5 November 2018:
https://fd.nl/opinie/1176019/nederland-moet-visie-formuleren-op-de-eigen-strategische-economische-belangen?_ga=2.218611481.189813815.1541413526-61973950.1541413526
- Herz, John. 1950. 'Idealist Internationalism and the Security Dilemma.' *World Politics* 2(2): 157-80.
- HM Government. 2015. 'National Security Strategy and Strategic Defence and Security Review 2015.' As of 8 January 2018:
https://assets.publishing.service.gov.uk/government/uploads/system/uploads/attachment_data/file/478933/52309_Cm_9161_NSS_SD_Review_web_only.pdf
- Hobbes, Thomas. 1996. *Leviathan*. Oxford: Oxford University Press.
- Hoffmann, Stanley. 1963. 'Rousseau on War and Peace.' *American Political Science Review* 57(2): 317–33.
- Hofs, Yvonne. 2019. 'Nederlandse motie tegen het 'steeds hechter verbond' in de EU is vooral een staaltje lekker politiek profileren.' *De Volkskrant*. As of 22 September 2019:
<https://www.volkskrant.nl/nieuws-achtergrond/nederlandse-motie-tegen-het-steeds-hechter-verbond-in-de-eu-is-vooral-een-staaltje-lekker-politiek-profileren-bfbdd4d0/>
- d'Hooghe, Ingrid, Annemarie Montulet, Marijn de Wolff and Frank N. Pieke. 2018. 'Assessing Europe-China collaboration in higher education and research.' Leiden Asia Centre. As of 14 August 2019: <https://leidenasiacentre.nl/wp-content/uploads/2018/11/LeidenAsiaCentre-Report-Assessing-Europe-China-Collaboration-in-Higher-Education-and-Research.pdf>
- Hultberg, Patrick. 2018. 'Promoting national security through steel tariffs?' *International Journal of Instructional Cases* (2). As of 22 September 2019:
http://www.ijicases.com/search/national_security_case/

- Huth, Paul K. 1988. *Extended Deterrence and the Prevention of War*. New Haven, Conn.: Yale University Press.
- International Energy Agency. 2019. 'World Energy Outlook 2018.' As of 16 May 2019: <https://www.iea.org/weo2018/>
- International Monetary Fund (IMF). 2018. 'Europe's Economic Outlook in Six Charts.' 8 November. As of 16 May 2019: <https://www.imf.org/en/News/Articles/2018/11/07/na181107-europe-economic-outlook-in-six-charts>
- Isaak, J. and M.J. Hanna. 2018. 'User Data Privacy: Facebook, Cambridge Analytica, and Privacy Protection.' *Computer* 51(8). As of 22 September 2019: <http://ieeexplore.ieee.org/stamp/stamp.jsp?tp=&arnumber=8436400&isnumber=8436391>
- Jackson, J. 2019. 'The Committee on Foreign Investment in the United States (CFIUS) .' Congressional Research Service Report. As of 16 May 2019: <https://www.everycrsreport.com/reports/RL33388.html>
- Jacobs, Andrew. 2019. 'A shadowy industry group shapes food policy around the world.' *New York Times*, As of 22 September 2019: <https://www.nytimes.com/2019/09/16/health/ilsa-food-policy-india-brazil-china.html?searchResultPosition=1>
- Jacobsen, Amanda. 2013. 'National Security and the Right to Information in Europe.' Centre for Advanced Security Theory. As of 8 January 2019: https://www.right2info.org/resources/publications/national-security-page/national-security-expert-papers/jacobsen_nat-sec-and-rti-in-europe
- Janning, Josef. 2019. 'Dutch courage: Is the Netherlands overconfident in its EU influence?' *European Council on Foreign Relations*. As of 22 September 2019: https://www.ecfr.eu/article/commentary_dutch_courage_is_netherlands_overconfident_in_its_eu_influen#
- Jervis, Robert. 1994. 'Hans Morgenthau, Realism, and the Scientific Study of International Politics.' *Social Research* 61(4): 853–76.
- Jessop, Bob. 2008. *State Power*. Cambridge: Polity Press. As of 29 October 2019: <https://www.wiley.com/en-gb/State+Power-p-9780745633213>
- Ji, You. 2016. 'China's National Security Commission: theory, evolution and operations.' *Journal of Contemporary China* 25 (98). As of 8 January 2019: <https://www.tandfonline.com/doi/pdf/10.1080/10670564.2015.1075717?needAccess=true>
- Johnson, K. & E. Groll. 2019. 'The Improbable Rise of Huawei.' *Foreign Policy*. 3 April 2019. As of 16 August 2019: <https://foreignpolicy.com/2019/04/03/the-improbable-rise-of-huawei-5g-global-network-china/>
- Jones, C.I., M.S. Takes & M. Spence. 1998. *Introduction of Economic Growth*. New York: Norton.
- Kaminskaya, T.E and V.A. Petrova. 2018. 'Cryptocurrency: Financial Revolution or a Threat to the Financial System.' Pacific National University. As of 17 May 2019: <https://knepublishing.com/index.php/Kne-Social/article/view/1532/3631>

- Karacasulu, Nilüfer and Elif Uzgören. 2007. 'Explaining Social Constructivist contributions to security studies.' *Perceptions*. As of 20 September 2019:
<http://sam.gov.tr/wp-content/uploads/2012/02/KaracasuluUzgoren.pdf>
- Kattan, Joseph. 2019. 'The Qualcomm Case and U.S. National Security.' As of 16 May 2019:
http://actonline.org/wp-content/uploads/The-Qualcomm-Case-and-National-Security_Final.pdf
- Kavanagh, Jennifer & Michael D. Rich. 2018. *Truth Decay: A Threat to Policymaking and Democracy*. Santa Monica, Calif: RAND Corporation.
- Keng Yam Tan, Tony. 2004. 'Ministerial Statement on Strategic Framework for Singapore's National Security, presented to Parliamentary sitting, 20th July 2004.' As of 23 January 2018:
<https://www.nscs.gov.sg/public-data/doc/speeches/2004/The-Strategic-Framework-for-Singapores-National-Security.pdf>
- Kenny, C., 2006. 'Measuring and reducing the impact of corruption in infrastructure.' The World Bank.
- Kitchen, Klon. 2019. 'Quantum Science and National Security: A Primer for Policymakers.' The Heritage Foundation, 5 February. As of 16 May 2019:
<https://www.heritage.org/technology/report/quantum-science-and-national-security-primer-policy-makers>
- Van Kooten, M.H.A., J.J.I. Sprenger, M. Jansen, M. Hunsche, D. Jenkins, B. Keijzer, A. Kokkoris, N. Ryan. 2016. 'Mogelijkheden om de afhankelijkheid van ICT-leveranciers te verminderen.' Verdonck, Klooster & Associates B.V., Berenschot, RAND Corporation.
- Kirshner, Jonathan. 1998. 'Disinflation, Structural Change, and Distribution'. *Review of Radical Political Economics* 30(1). As of 7 November 2019:
<https://journals.sagepub.com/doi/abs/10.1177/048661349803000103>
- Kof Swiss Economic Institute. 2019. 'KOF Globalisation Index'. ETH Zurich. As of 7 November 2019:
<https://kof.ethz.ch/en/forecasts-and-indicators/indicators/kof-globalisation-index.html>
- Korab-Karpowicz, W. Julian. 2018. 'Political Realism in International Relations.' *Stanford Encyclopedia of Philosophy*. As of 7 December 2018:
<https://plato.stanford.edu/entries/realism-intl-relations/>
- Korteweg, Rem. 2017. 'How the Dutch fell out of love with the EU.' *Clingendael Magazine*, 9 March. As of 29 October 2019: <https://www.clingendael.org/publication/how-dutch-fell-out-love-eu>
- KPMG. 2017. 'Not welcome here: The rising threat of protectionism.' As of 17 May 2019:
<https://home.kpmg/xx/en/home/insights/2017/03/paying-the-price.html>
- . 2017b. 'Focus on Cross-Border Deals with China.' As of 15 August 2019:
<https://assets.kpmg/content/dam/kpmg/nl/pdf/2018/advisory/deal-activity-update-2017-analysis.pdf>
- Kraindler, Joshua, Ben Gershlick, Anita Charlesworth. 2019. 'Failing to Capitalise: Capital spending in the NHS.' The Health Foundation. As of 25 April 2019:
<https://www.health.org.uk/publications/reports/failing-to-capitalise>

- Krugman, P., M. Obstfeld & M. J. Melitz. 2009. *International Economics: Theory and Policy*. 8th Edition. Reading, MA: Addison-Wesley.
- Kutlina-Dimitrova, Zornitsa. 2018. 'Government Procurement: Data, Trends and Protectionist Tendencies. Chief Economist Note.' As of 17 May 2019: http://trade.ec.europa.eu/doclib/docs/2018/september/tradoc_157319.pdf
- Laterza, Vito. 2018. 'Cambridge Analytica, independent research and the national interest.' *Anthropology Today* 34(3). As of 29 October 2019: <https://rai.onlinelibrary.wiley.com/doi/pdf/10.1111/1467-8322.12430>
- Leal-Arcas, Rafael; Feja Lesniewska and Filippos Proedrou. 2018. 'Prosumers: New Actors in EU Energy Security.' *Netherlands Yearbook of International Law* (48). As of 17 May 2019: https://link.springer.com/chapter/10.1007/978-94-6265-243-9_5
- Léautier, Frannie & Lemer, Andrew. 2003. 'Perspectives on Globalization of Infrastructure.' World Bank Institute Working Papers, 28616. As of 17 May 2019: http://documents.worldbank.org/curated/en/579141468779096309/pdf/286160Perspectives0wb_i0wp.pdf
- Van Leijen, Majorie. 2019. 'GVT and Port of Rotterdam extend cooperation Chinese rail partners.' Rail Freight.com. As of 15 August 2019: <https://www.railfreight.com/beltandroad/2019/05/22/gvt-and-port-of-rotterdam-extend-cooperation-chinese-rail-partners/?gdpr=accept>
- Leijten, Jorg and Esther Rosenberg. 2017. 'Overheid eist invloed bij cyberbeveiliging Fox-IT' ['Government demands influence with cyber security Fox-IT']. NRC.nl. As of 14 August 2019: <https://www.nrc.nl/nieuws/2017/01/24/overheid-eist-invloed-bij-cyberbeveiliging-fox-it-6382806-a1542772>
- Lewis, R.J. 2004. 'Academic Emergency Medicine and the "Tragedy of the Commons".' *Academic Emergency Medicine*, 11(5): 423–7.
- Lin, Leo. 2011. 'State-centric Security and its Limitations: The case of transnational organized crime.' Research Institute for European and American Studies (RIEAS). Research paper No. 156.
- Liotta, Peter H. & Taylor Owen. 2006. 'Why Human Security?' *The Whitehead Journal of Diplomacy and International Relations* 7: 37.
- Lippmann, Walter. 1943. *U.S. Foreign Policy*. Boston: Little, Brown and Company.
- Livingston, Steve, Suzanna Sanborn, Andrew Slaughter and Paul Zonneveld. 2019. 'Managing cyber risk in the electric power sector.' Deloitte. As of 17 May 2019: <https://www2.deloitte.com/insights/us/en/industry/power-and-utilities/cyber-risk-electric-power-sector.html>
- Lloyd, Sharon & Susanne Sreedhar. 2018. 'Hobbes's Moral and Political Philosophy.' Stanford Encyclopedia of Philosophy, 30 April. As of 3 December 2018: <https://plato.stanford.edu/entries/hobbes-moral/>
- Lockett, Hudson. 2016. 'China's Cosco expands in Rotterdam.' *Financial Times*. As of 14 August 2019: <https://www.ft.com/content/d59d9357-8a87-30fb-8036-f6f26632fcaa>

- Luijck, E., H. Burger & M. Klaver. 2003. 'Bescherming Vitale Infrastructuur: Quick-scan naar vitale producten en diensten.' TNO rapport FEL-03-C001, 2003.
- Machiavelli, Niccolo. *The Prince*, originally published 1532. As of 22 September 2019: <https://www.gutenberg.org/files/1232/1232-h/1232-h.htm>
- Mankiw, Nicholas Gregory. 2015. *Principles of Macroeconomics*. 7th edition. Boston, MA: Cengage Learning.
- Martin, Will. 2016. 'An ageing population is about to have a big impact on Europe's economy.' WeForum. As of 15 August 2019. <https://www.weforum.org/agenda/2016/08/an-ageing-population-is-about-to-have-a-big-impact-on-europes-economy>
- Masters, Jonathan & James McBride. 2018. 'Foreign Investment and US National Security.' 28 August, Council on Foreign Relations. As of 30 August 2018: <https://www.cfr.org/backgrounder/foreign-investment-and-us-national-security>
- Mathews, Jessica Tuchman. 1989. 'Redefining Security.' *Foreign Affairs* 68(2): 162–77.
- Matsa, Katerina Eva, Elisa Shearer Laura Silver, & Mason Walker. 2018. 'Western Europeans under 30 view news media less positively, rely more on digital platforms than older adults.' *Pew Research Center Journalism & Media*. As of 27 January 2019: <http://www.journalism.org/2018/10/30/western-europeans-under-30-view-news-media-less-positively-rely-more-on-digital-platforms-than-older-adults/>
- May, Christopher. 2008. 'Strange fruit: Susan Strange's theory of structural power in the international political economy.' *Global Society* 10(2). As of 20 September 2019: <https://www.tandfonline.com/doi/abs/10.1080/13600829608443105?journalCode=cgsj20>;
- Mazarr, Michael J. 2018. *Understanding Deterrence*. Santa Monica, Calif.: RAND Corporation. PE-295-RC.
- McDonald, Matt. 2008. 'Constructivism.' In *Security Studies: An Introduction*, edited by Paul D. Williams. New York: Routledge.
- McSweeney, Bill. 1996. 'Identity and Security: Buzan and the Copenhagen school.' *Review of International Studies* 22(1): 81–93.
- Mearsheimer, John. 2001. *The Tragedy of Great Power Politics*. New York: WW Norton & Company.
- . 2002. 'Realism, the Real World, and the Academy.' *Realism and Institutionalism in International Studies*: 22–33.
- Medeiros, Evan S., Roger Cliff, Keith Crane, and James C. Mulvenon, A New Direction for China's Defense Industry. Santa Monica, CA: RAND Corporation, 2005. <https://www.rand.org/pubs/monographs/MG334.html>
- Meggison, William L. 2017. 'Privatization, State Capitalism, and State Ownership of Business in the 21st Century.' *Foundations and Trends in Finance* 11 (1–2), 1–153. <http://dx.doi.org/10.1561/05000000053>
- Meierding, Emily. 2013. 'Energy Security and Sub-Saharan Africa.' As of 29 October 2019: <https://journals.openedition.org/poldev/744>

- Mennen, M.G. 2014. 'National Risk Assessment 6.' National Security Analyst Network. As of 14 August 2019: https://www.nctv.nl/binaries/nat.risicobeoordeling-6-definitief_tcm31-32706.pdf
- Military Factory. 2019. 'National security interests definition (US DoD).' As of 29 October 2019: https://www.militaryfactory.com/dictionary/military-terms-defined.asp?term_id=3602
- Miller, Jon. 2014. 'Hugo Grotius.' *Stanford Encyclopedia of Philosophy*. As of 12 February 2019: <https://plato.stanford.edu/entries/grotius/>
- Mindef Singapore. 2018. 'Fact Sheet: Total Defence 2018'. Singapore Government. As of 7 November 2019: https://www.mindef.gov.sg/web/portal/mindef/news-and-events/latest-releases/article-detail/2018/february/14feb18_fs
- Ministerie van Binnenlandse Zaken en Koninkrijksrelaties. 2007. 'National Security Strategy and Work Programme 2007–2008.' Breda: Broese & Peereboom.
- . 2009. 'Factsheet Methodiek Nationale Risicobeoordeling.' As of 28 August 2018: https://www.nctv.nl/binaries/factsheet-methodiek-nationale-risicobeoordeling_tcm31-32503.pdf
- Ministerie van Buitenlandse Zaken. 2013. 'Internationale Veiligheidsstrategie: Veilige Wereld, Veilig Nederland.' As of 28 August 2018: <https://www.rijksoverheid.nl/binaries/rijksoverheid/documenten/rapporten/2013/06/21/veilige-wereld-veilig-nederland-internationale-veiligheidsstrategie/veilige-wereld-veilig-nederland-internationale-veiligheidsstrategie.pdf>
- . 2018. 'Working Worldwide for the Security of the Netherlands: An Integrated International Security Strategy 2018–2022.' The Hague: Ministry of Foreign Affairs.
- . 2019. 'Antwoorden op feitelijke vragen over het Verscherpt toezicht op studenten en onderzoekers uit.' As of 15 August 2019: <https://www.rijksoverheid.nl/binaries/rijksoverheid/documenten/kamerstukken/2019/06/03/beantwoording-vragen-over-verscherpt-toezicht-op-studenten-en-onderzoekers-uit-risicolanden/beantwoording-vragen-over-verscherpt-toezicht-op-studenten-en-onderzoekers-uit-risicolanden.pdf>
- Ministerie van Defensie. 'Defensie Cyber Strategie 2018.' As of 15 August 2019: <https://www.defensie.nl/downloads/publicaties/2018/11/12/defensie-cyber-strategie-2018>
- Ministerie van Veiligheid en Justitie. 2013. 'Werken met scenario's, risicobeoordeling en capaciteiten: in de Strategie Nationale Veiligheid.' Den Haag: Ministerie van Veiligheid en Justitie.
- . 2016. Voortgangsbrief Nationale Veiligheid. 15 September 2019. As of 19 May 2019: https://www.nctv.nl/binaries/Voortgangsbrief%20Nationale%20Veiligheid_tcm31-98709.pdf
- Ministry of Economic Affairs. 2017. 'Energy Agenda: Towards a low-carbon energy supply.' <https://www.government.nl/binaries/government/documents/reports/2017/03/01/energy-agenda-towards-a-low-carbon-energy-supply/Energy+agenda.pdf>
- Mitchell, Katharyne. 2017. 'Transnationalism.' *International Encyclopaedia of Geography*. As of 22 September 2019: <https://onlinelibrary.wiley.com/doi/abs/10.1002/9781118786352.wbieg0035>

- Mol, Arthur. 2016. 'The environmental nation state in decline.' *Environmental Politics* 25 (1). doi: 10.1080/09644016.2015.1074385
- Møller, Bjørn. 2000. 'The Concept of Security: The Pros and Cons of Expansion and Contraction.' Copenhagen Peace Research Institute. As of 19 December 2018: <https://www.peacepalacelibrary.nl/ebooks/files/370659244.pdf>
- Molnar, Eva. 2018. 'Digital Security Risks to Transport Infrastructure: Automated Vehicles.' Presentation from the OECD Workshop on Digital Security and Resilience in Critical Infrastructure and Essential Services. As of 17 May 2019: <https://www.oecd.org/going-digital/digital-security-in-critical-infrastructure/digital-security-workshop-february-2018-%20Molnar.pdf>
- Moravcsik, Andrew. 2001. 'Liberal International Relations Theory: A social scientific assessment.' Vol. 1–2. Harvard University, Cambridge, MA: Weatherhead Center for International Affairs.
- Morgan, Susan. 2018. 'Fake news, disinformation, manipulation and online tactics to undermine democracy.' *Journal of Cyber Policy* 3:1, 39–43.
- Morgenthau, Hans. 1946. 'Scientific Man Versus Power Politics.' Chicago: University of Chicago Press.
- Muresan, Liviu. 1998. 'Non Military Risks to the International Security in Central and Eastern Europe after the Cold War.' Bucharest, Romania: NATO. As of 19 December 2018: <https://www.nato.int/acad/fellow/96-98/muresan.pdf>
- Najmabadi, Shannon. 2016. 'How Can Students Be Taught to Detect Fake News and Dubious Claims?' *Chronicle of Higher Education*, 63 (18). As of 21 January 2019: <https://www.chronicle.com/article/How-Can-Students-Be-Taught-to/238652>
- Nanto, Dick. 2011. 'Economics and National Security: Issues and Implications for U.S. Policy.' Washington, D.C.: Congressional Research Service.
- National Coordinator for Security and Counterterrorism (NCTV). 2014. 'Tussen naïviteit en paranoia: Nationale veiligheidsbelangen bij buitenlandse overnames en investeringen in vitale sectoren.' As of 14 August 2019: https://www.nctv.nl/binaries/rapportage-werkgroep-economische-veiligheid_tcm31-32711.pdf
- . 2018. 'Strategie Nationale Veiligheid.' As of 28 August 2018: https://www.nctv.nl/organisatie/nationale_veiligheid/strategie_nationale_veiligheid/index.aspx
- . 2019a. 'Critical Infrastructure (Protection).' As of 16 May 2019: https://english.nctv.nl/topics_a_z/critical_infrastructure_protection/index.aspx
- . 2019b. 'Review of policy on critical infrastructure.' As of 25 April 2019: https://english.nctv.nl/topics_a_z/critical_infrastructure_protection/review_policy_critical_infrastructure.aspx
- . 2019c. 'Weerbaarheidsverhogende instrumenten.' As of 16 May 2019: https://www.nctv.nl/organisatie/nationale_veiligheid/vitale_infrastructuur/weerbaarheidsverhogende-instrumenten.aspx

- . 2019d. 'Nationale Veiligheid Strategie.' As of 15 July 2019:
https://www.nctv.nl/binaries/Nationale%20Veiligheid%20Strategie%202019_tcm31-393099.pdf
- National Endowment for Democracy. 2018. 'Issue Brief: How Disinformation Impacts Politics and Publics.' As of 17 May 2019:
<https://www.ned.org/issue-brief-how-disinformation-impacts-politics-and-publics/>
- National Security Coordination Centre. 2004. 'The fight against terror: Singapore's national security strategy.' As of 23 January 2019:
<https://www.nscs.gov.sg/public-data/doc/resources/25fight-terror.pdf>
- Navari, Cornelia. 2008. 'Liberalism.' In *Security Studies: An Introduction*, edited by Paul D. Williams. New York: Routledge.
- NCTV. 2014 'Tussen naïviteit en paranoia - Nationale veiligheidsbelangen bij buitenlandse overnames en investeringen in vitale sectoren.' Rapportage Werkgroep Economische Veiligheid, April 2014. As of 29 October 2019:
https://www.nctv.nl/binaries/rapportage-werkgroep-economische-veiligheid_tcm31-32711.pdf
- . 2018. 'Factsheet: Critical Infrastructure.' As of 19 May 2019:
https://english.nctv.nl/binaries/Factsheet%20Critical%20Infrastructure%20ENG%202018_tcm32-240750.pdf
- . 2018b. 'Cyber Security Assessment Netherlands: CSAN 2018.' As of 29 October 2019:
https://english.nctv.nl/binaries/CSBN2018_EN_web_tcm32-346655.pdf
- . 2019. 'Vitale Infrastructuur. Weerbaarheidsverhogende Instrumenten.' As of 19 May 2019:
https://www.nctv.nl/organisatie/nationale_veiligheid/vitale_infrastructuur/weerbaarheidsverhogende-instrumenten.aspx
- Netherlands Ministry of Defence and Ministry of Economic Affairs and Climate Policy. 2018. 'NOTA Defensie Industrie Strategie.' The Hague: Ministerie van Defensie.
- Netherlands Ministry of Foreign Affairs. 2019. 'The Netherlands and China: A new balance.' As of 14 August 2019: <https://www.government.nl/binaries/government/documents/policy-notes/2019/05/15/china-strategy-the-netherlands--china-a-new-balance/Summary+China+strategy.pdf>
- Neu, Richard, & Charles Wolf. 1994. *The Economic Dimensions of National Security*. Santa Monica, Calif.: RAND Corporation. MR-466-OSD. As of 18 December 2018:
https://www.rand.org/pubs/monograph_reports/MR466.html
- Nuffic. 2018. 'Incoming student mobility in Dutch higher education 2017-2018.' As of 29 October 2019: <https://www.nuffic.nl/documents/219/incoming-student-mobility-in-dutch-higher-education-2017-2018.pdf>
- Nyborg, Karine, and Mari Rege. 2003. 'Does public policy crowd out private contributions to public goods?' *Public Choice* 115. As of 22 September 2019: <https://www.jstor.org/stable/30025998>

- OECD. 2017. 'OECD Digital Economy Outlook 2017.' As of 29 October 2019:
<https://www.oecd.org/internet/oecd-digital-economy-outlook-2017-9789264276284-en.htm>
- Official Journal of the European Union. 2008. 'Council Directive 2008/114/EC of 8 December 2008 on the identification and designation of European critical infrastructures and the assessment of the need to improve their protection.' 345: 23 December 2008, 75–82.
- Oliker, Olga. 2016. 'Unpacking Russia's National Security Strategy.' Centre for Strategic and International Studies. As of 8 January 2018:
<https://www.csis.org/analysis/unpacking-russias-new-national-security-strategy>
- Olivares, Miguel. 2018. 'Has critical security studies run out of steam?' University of Westminster. As of 20 September 2019:
<https://www.e-ir.info/2018/05/02/has-critical-security-studies-run-out-of-steam/>
- Organisation for Economic Co-operation and Development (OECD). 2017. 'Terrorism, corruption and the criminal exploitation of natural resources.' As of 16 May 2019:
<http://www.oecd.org/corruption/Terrorism-Corruption-Criminal-Exploitation-Natural-Resources-2017.pdf>
- . 2018. 'Privatisation and the Broadening of Ownership of State-Owned Enterprises.' As of 17 May 2019: <https://www.oecd.org/daf/ca/Privatisation-and-the-Broadening-of-Ownership-of-SOEs-Stocktaking-of-National-Practices.pdf>
- Overheid.nl. 2019. 'Wet beveilgning netwerk- en informatiesystemen.' BWBR0041515. As of 16 May 2019: <https://wetten.overheid.nl/BWBR0041515/2019-01-01>
- Owen, John M. 1994. 'How liberalism produces democratic peace.' *International Security* 19(2): 87-125.
- . 2017. 'Liberalism and Security.' Oxford University Press.
<http://oxfordre.com/internationalstudies/view/10.1093/acrefore/9780190846626.001.0001/acrefore-9780190846626-e-33>
- Owens, Rachel. 2016. 'Corruption in the energy sector is a transnational problem, enforcement efforts must be too.' *Global Witness*, 20 December. As of 16 May 2019:
<https://www.globalwitness.org/it/blog/corruption-energy-sector-transnational-problem-enforcement-efforts-must-be-too/>
- Parfomak, Paul W. 2008. 'Vulnerability of concentrated critical infrastructure: Background and policy options.' Library of congress. Washington DC: Congressional research Service.
- Park, D., J. Summers & M. Walstrom. 2017. 'Cyberattack on Critical Infrastructure: Russia and the Ukrainian Power Grid Attacks.' Henry M. Jackson School of International Studies, University of Washington. As of 16 May 2019: <https://jsis.washington.edu/news/cyberattack-critical-infrastructure-russia-ukrainian-power-grid-attacks/>
- Parliament of Australia. 2008. 'National Security.' As of 8 January 2018:
<https://parlinfo.aph.gov.au/parlInfo/search/display/display.w3p;query=Id:%22chamber/hansardr/2008-12-04/0045%22>

- Patrick, Kate. 2019. 'U.S. Senators Propose Tech Supply Chain Security Office.' Government Technology, 15 January. As of 16 May 2019: <https://www.govtech.com/security/US-Senators-Propose-Tech-Supply-Chain-Security-Office.html>
- Pelgrim, Christiaan. 2019. 'KPN kiest omstreden Huawei voor antennes van 5G-netwerk.' NRC.nl. As of 16 Aug 2019: <https://www.nrc.nl/nieuws/2019/04/26/kpn-kiest-omstreden-huawei-voor-g5-netwerk-a3958252>
- Perera, Rick. 2001. 'German Parliament Considers Linux Switch.' CNN. As of 22 September: <http://www.cnn.com/2001/TECH/industry/10/16/german.parliament.idg/>
- Persily, Nathaniel. 2017. 'The 2016 U.S. Election: Can Democracy Survive the Internet?' *Journal of Democracy* 28 (2). doi:10.1353/jod.2017.0025
- Piètre-Cambacédès, Ludovic & Claude Chaudet. 2010. 'The SEMA referential framework: Avoiding ambiguities in the terms "security" and "safety"'. *International Journal of Critical Infrastructure Protection* 3(2): 55–66.
- Pol-de Jongh, L.A. van de, R. Delahaye & K. Keller. 2016. 'Material Flow Monitor Time Series 2008-2014.' Centraal Bureau voor de Statistiek. As of 15 August 2019: https://www.cbs.nl/-/media/_pdf/2016/49/material%20flow%20monitor%20time%20series%202008-2014.pdf
- Polyakova, Alina and Daniel Fried. 2019. 'Democratic Defense Against Disinformation 2.0.' Atlantic Council. As of 22 September 2019: <https://www.atlanticcouncil.org/in-depth-research-reports/report/democratic-defense-against-disinformation-2-0/>
- Proper, Ellen. 2019. 'ASML wins \$845 million trade theft case against bankrupt XTAL.' Bloomberg. As of 15 August 2019: <https://www.bloomberg.com/news/articles/2019-05-04/asml-wins-845-million-trade-theft-case-against-bankrupt-xtal>
- Public-Private Analytic Exchange Program (AEP). 2017. 'Supply Chain Risks of SCADA/Industrial Control Systems in the Electricity Sector: Recognizing Risks and Recommended Mitigation Actions'. As of 7 November 2019: https://www.dni.gov/files/PE/Documents/11---Supply-Chain-Risks-of-SCADA-Industrial-Control-Systems-in-the-Electricity-Sector_Risks-and-Mitigations.pdf
- Public Safety Canada. 2015. 'Securing an open society: Canada's National Security Policy.' As of 8 January 2019: <https://www.publicsafety.gc.ca/cnt/ntnl-scrt/scrng-en.aspx>
- . 2018. 'Public Safety Canada Departmental Plan 2018-2019.' As of 8 January 2019: <https://www.publicsafety.gc.ca/cnt/rsrscs/pblctns/dprtmntl-pln-2018-19/index-en.aspx>
- van der Putten, F-P. 2017. 'Chinese Direct Investment in the Netherlands: patterns, reception and political significance.' Clingendael report. December 2017. As of 19 May 2019: https://www.clingendael.org/sites/default/files/2017-12/PB_Chinese_Investment_Netherlands.pdf
- Quéro, Yann-Cedric and Benoît Dupont. 2019. 'Nodal governance: toward a better understanding of node relationships in local security governance'. *Policing and Society* 29(3). doi:10.1080/10439463.2017.1391808

- Ratkiewicz, J., Conover, M., Meiss, M., Goncalves, B., Flammini, A., & Menczer, F. 2011. 'Detecting and tracking political abuse in social media.' 5th International Conference on Weblogs & Society Med: 297–304. As of 21 January 2019:
<http://citeseerx.ist.psu.edu/viewdoc/summary?doi=10.1.1.646.5073>
- Reuters. 2019. 'ASML says it suffered intellectual property theft, rejects "Chinese" label.' 11 April 2019. As of 29 October 2019: <https://www.reuters.com/article/us-asml-china-spying/asml-says-it-suffered-intellectual-property-theft-rejects-chinese-label-idUSKCN1RN0DK>
- Revell, Piers. 2006. 'Supplement to *States and Markets*: an investigation of the "knowledge structure" in the work of Susan Strange.' London School of Economics. As of 20 September 2019: <http://etheses.lse.ac.uk/2919/1/U615870.pdf>
- Ridder, Marjolein; Sijbren de Jong, Joren Selleslaghs, Thom Achterbosch, Roel Jongeneel, Petra Berkhout and Martijn van der Heide. 2013. 'The emerging geopolitics of food.' Hague Centre for Strategic Studies (HCSS). As of 15 August 2019: <https://edepot.wur.nl/251945>
- Ridder, Marjolein; Pim ten Haaf, Nathalie Olah, Hans Bolscher. 2015. 'Soy Supply Security for the Netherlands.' Centre of Expertise on Resources. As of 15 August 2019: <https://hcss.nl/sites/default/files/files/reports/COE-Soy.pdf>
- Ridley, Gail. 2011. 'National Security as a Corporate Social Responsibility: Critical Infrastructure Resilience.' *Journal of Business Ethics* 103(1). As of 22 September 2019: <https://www.jstor.org/stable/41476014>
- Ries, C., M. Hafner, T. Smith, F. Burwell, D. Egel, E. Han, M. Stepanek, H. Shatz. 2017. *After Brexit: Alternate forms of Brexit and their implications for the United Kingdom, the European Union and the United States*. Calif.: Santa Monica. RAND Corporation. As of 29 October 2019: https://www.rand.org/pubs/research_reports/RR2200.html
- Rijksinstituut voor Volksgezondheid en Milieu (RIVM). 2016. 'Nationaal Veiligheidsprofiel.' As of 29 October 2019: <https://www.rivm.nl/documenten/nationaal-veiligheidsprofiel-2016>
- . 2018. 'Horizonscan Nationale Veiligheid 2018. Analistennetwerk Nationale Veiligheid.' As of 29 October 2019: https://www.thehaguesecuritydelta.com/media/com_hsd/report/216/document/ANV-Horizonscan-Nationale-Veiligheid-2018.pdf
- Rintoul, Jesse. 2019. 'Farming for the future: 5 reasons why the Netherlands is the 2nd largest food importer in the world.' *Dutch Review*. As of 1 August 2019: <https://dutchreview.com/news/innovation/how-the-netherlands-remains-second-largest-agriculture-exporter-in-the-world/>
- Romaniuk, Scott. 2018. 'Copenhagen School.' In *The SAGE Encyclopedia of Surveillance, Security, and Privacy*, edited by Bruce A. Arrigo. Thousand Oaks: Sage Publications. As of 20 September 2019: https://www.researchgate.net/publication/328232795_Copenhagen_School
- Ronis, Sheila. 2011. 'Economic Security: Neglected Dimension of National Security?' Washington, D.C.: National Defense University Press.

- Rothschild, Emma. 1995. 'What is security?' *Daedalus* 124(3): 53–98.
- Russian Federation. 2015. 'Russian Federation National Security Strategy.' As of 29 October 2019: <http://www.ieee.es/Galerias/fichero/OtrasPublicaciones/Internacional/2016/Russian-National-Security-Strategy-31Dec2015.pdf>
- Sachs, Steve. 2003. 'The Changing Definition of Security.' Merton College, Oxford. As of 7 December 2018: http://www.stevesachs.com/papers/paper_security.html
- Salter, John. 2001. 'Property and Consent.' *Political Theory*. 29(4): 537–55.
- Scharpf, Fritz. 1999. *Governing in Europe. Effective and Democratic?* Oxford: Oxford University Press. As of 29 October 2019: <https://www.oxfordscholarship.com/view/10.1093/acprof:oso/9780198295457.001.0001/acprof-9780198295457>
- Schelling, Thomas. 1980. *The Strategy of Conflict*. Cambridge, Mass.: Harvard University Press.
- . 2008. *Arms and Influence*. New Haven, Conn.: Yale University Press.
- Schneier, Bruce. 2006. 'Beyond Fear: Thinking sensibly about security in an uncertain world.' Springer Science & Business Media.
- Seaman, John, Mikko Huotari and Miguel Otero-Iglesias. 2017. 'Chinese investment in Europe: A Country-level approach.' European Think-tank Network on China (ETNC). As of 14 August 2019: https://www.clingendael.org/sites/default/files/2017-12/ETNC_Report_2017.PDF
- Second Chamber of the States General. 2009. 'BRIEF VAN DE MINISTERS VAN FINANCIËN EN ECONOMISCHE ZAKEN' ['Letter from the Ministers of Finance and Economic Affairs']. As of 14 August 2019: <https://zoek.officielebekendmakingen.nl/kst-31350-8.html>
- Setola, Roberto, Eric Luijff & Marianthi Theocharidou. 2016. 'Critical infrastructures, protection and resilience.' In *Managing the Complexity of Critical Infrastructures*, 1–18. Cham: Springer.
- Silfversten, E., Phillips, W., Persi Paoli, G., Ciobanu, C. 2018. *Economics Of Vulnerability Disclosure*. As of 17 May 2019: <https://www.enisa.europa.eu/publications/economics-of-vulnerability-disclosure>
- Singh, Ningthoujam Koiremba & William Nunes. 2016. 'Nontraditional Security: Redefining State-centric Outlook.' 20(1): 102–24. doi:10.1177/0973598416658805
- Skills Panorama. 2019. 'The Netherlands: Mismatch Priority Occupations.' Cedefop. As of 19 May: https://skillspanorama.cedefop.europa.eu/en/analytical_highlights/netherlands-mismatch-priority-occupations
- Skills Panorama. 2014. 'Focus on: Science, technology, engineering and mathematics (STEM) skills.' Cedefop. As of 19 May 2019: https://skillspanorama.cedefop.europa.eu/sites/default/files/EUSP_AH_STEM_0.pdf
- Sloman, John, Dean Garratt & Alison Wride. 2012. *Economics*. Harrow: Pearson.
- Sociaal-Economische Raad (SER). 2013. 'Agreement on energy for sustainable growth.' As of 1 August 2019: <https://www.energieakkoordser.nl/doen/engels.aspx>

- Sohail, M. & Cavill, S. 2006. 'Combating corruption in the delivery of infrastructure services.' As of 16 May 2019: https://dspace.lboro.ac.uk/dspace-jspui/bitstream/2134/3951/1/_Reading_+Combating+Corruption+in+the+Delivery+of+Infrastructure+Services1.pdf
- Soreide, T., A. Estache, J. Hallak, P. Le Billon, M. Poisson, V. Somville and T. Vian. 2014. 'Consequences of Corruption at the Sector Level and Implications for Economic Growth and Development.' As of 16 May 2019: https://www.bmjv.de/SharedDocs/Downloads/EN/G20/Consequences%20of%20Corruption%20at%20the%20Sector%20Level%20and%20Implications%20for%20Economic%20Growth%20and%20Development,%20prepared%20by%20the%20OECD%20and%20the%20World%20Bank.pdf?__blob=publicationFile&v=1
- Spiegel, M. 2002. 'Public Safety as a Public Good.' In *Markets, Pricing, and Deregulation of Utilities*, edited by Crew M.A., Schuh J.C. Topics in Regulatory Economics and Policy Series, vol 40. Boston, MA: Springer.
- De Spiegeleire, Stephan; Eline Chivot and Tim Sweijjs. 2012. 'Reconceptualizing Security.' *European security trends and threats in society (ETTIS)*. As of 21 January 2018: https://www.researchgate.net/publication/260061836_Reconceptualizing_Security_Final_Deliverable_of_Work_Package_11_Concepts_of_Security_of_European_Security_Trends_and_Threats_In_Society_ETTIS_a_European_Union_Seventh_Framework_Programme_collaborative
- Statline. 2019. 'Types of goods by country; mineral fuel and chemistry.' CBS. As of 29 October 2019: <https://opendata.cbs.nl/statline/#/CBS/nl/dataset/81268ned/table?dl=23F73>
- Stern, Jonathan, Simon Pirani and Katja Yafimava. 2010. 'The Russo-Ukrainian Gas Dispute of January 2009: A Comprehensive Assessment.' Oxford Institute for Energy Studies. As of 14 August 2019: <https://www.oxfordenergy.org/wpcms/wp-content/uploads/2010/11/NG27-TheRussoUkrainianGasDisputeofJanuary2009AComprehensiveAssessment-JonathanSternSimonPiraniKatjaYafimava-2009.pdf>
- Sternberg, Troy. 2014. 'Chinese Drought, Wheat, and the Egyptian Uprising: How a Localized Hazard became Globalized.' ETH Zurich. As of 15 August 2019: <https://css.ethz.ch/en/services/digital-library/articles/article.html/178763/pdf>
- Stewart, Frances. 2004. 'Development and Security.' Queen Elizabeth House, University of Oxford: Centre for Research on Inequality, Human Security and Ethnicity (CRISE).
- Stolton, S. 2019. 'Commission rolls out 5G recommendations, has "specific concerns" about Huawei.' Euractiv. 26 March 2019. As of 17 May 2019: <https://www.euractiv.com/section/5g/news/commission-rolls-out-5g-recommendations-has-specific-concerns-about-huawei/>
- Stockemer, D., B. LaMontagne & L. Scruggs. 2013. 'Bribes and ballots: The impact of corruption on voter turnout in democracies.' *International Political Science Review*, 34(1), 74–90.

- Strange, Susan. 1970. 'International Economics and International Relations: A Case of Mutual Neglect.' *International Affairs* 46 (2). As of 20 September 2019: <https://academic.oup.com/ia/article-abstract/46/2/304/2668342?redirectedFrom=fulltext>
- Subacchi, Paola, Stephen Pickford, Davide Tentori & Helena Huang. 2014. 'Building Growth in Europe: Innovative Financing for Infrastructure.' London: Chatham House. As of 29 October 2019: https://www.chathamhouse.org/sites/default/files/field/field_document/20140930EuropeFinancingInfrastructureSubacchiPickfordTentoriHuang.pdf
- Sullivan, Julia and Dmitriy Kamsensky. 2017. 'How cyber-attacks in Ukraine show the vulnerability of the US power grid.' *The Electricity Journal* (30):3. As of 17 May 2019: <https://www.sciencedirect.com/science/article/pii/S1040619017300507>
- Sun, Yun. 2013. 'Chinese National Security Decision-Making: Processes and Challenges.' Brookings. As of 8 January 2019: <https://www.brookings.edu/research/chinese-national-security-decision-making-processes-and-challenges/>
- Swedish Civil Contingencies Agency. 2014. 'Action Plan for the Protection of Vital Societal Functions & Critical Infrastructure.' As of 25 April 2019: <https://www.msb.se/RibData/Filer/pdf/27412.pdf>
- Tal, Johnathan. 2018. 'America's Critical Infrastructure: Threats, Vulnerabilities and Solutions.' Securityinfowatch.com, 20 September 2018. As of 16 May 2019: <https://www.securityinfowatch.com/access-identity/access-control/article/12427447/americas-critical-infrastructure-threats-vulnerabilities-and-solutions>
- Talton, Ellis & Remington Tonar. 2018. 'A Lack Of Cybersecurity Funding And Expertise Threatens U.S. Infrastructure.' Forbes. As of 25 April 2019: <https://www.forbes.com/sites/ellistalton/2018/04/23/the-u-s-governments-lack-of-cybersecurity-expertise-threatens-our-infrastructure/#3a473d9549e0>
- Techniekpact. 2014. 'Summary Dutch Technology Pact 2020.' As of 14 August 2019: <https://www.techniekpact.nl/wp-content/uploads/2014/03/Dutch-Technology-Pact-Summary.pdf>
- Thompson, Lynne C. & Sheila R. Ronis. 2005. 'U.S. Defense Industrial Base: National Security Implications of a Globalized World.' The 2005 Dwight D. Eisenhower National Security Series Symposium: National Defence University.
- Thumfart, Johannes. 2009. 'On Grotius's Mare Liberum and Vitoria's De Indis, Following Agamben and Schmitt.' *Grotiana* 30(1): 65–87.
- Tiezzi, Shannon. 2015. 'China's National Security Strategy.' *The Diplomat*. As of 8th January 2019: <https://thediplomat.com/2015/01/chinas-national-security-strategy/>
- Toet, Diederik. 2018. 'De 13 opmerkelijkste it-overnames van 2018' ['The 13 most remarkable takeovers of 2018']. *Computable*. As of 29 October 2019: <https://www.computable.nl/artikel/nieuws/ict-branchel/6538408/250449/de-13-opmerkelijkste-it-overnames-van-2018.html>

- Travalini, Joanna. 2009. 'Foreign Direct Investment in the United States: Achieving a Balance between National Economy Benefits and National Security Interests'. *Northwestern Journal of International Law and Business* 29: 779–800.
- Trend Micro. 2018a. 'Midyear Security Roundup: Unseen Threats, Imminent Losses.' 28 August. As of 16 May 2019: <https://www.trendmicro.com/vinfo/us/security/research-and-analysis/threat-reports/roundup/unseen-threats-imminent-losses>
- Trend Micro. 2018b. 'Critical Infrastructures Exposed and at Risk: Energy and Water Industries.' 30 October. As of 16 May 2019: <https://www.trendmicro.com/vinfo/us/security/news/cybercrime-and-digital-threats/exposed-and-vulnerable-critical-infrastructure-the-water-energy-industries>
- Trend Micro. 2019. 'New Critical Infrastructure Facility Hit by Group Behind TRITON.' 11 April. As of 16 May 2019: <https://www.trendmicro.com/vinfo/us/security/news/cyber-attacks/new-critical-infrastructure-facility-hit-by-group-behind-triton>
- Trident Response group. 2019. 'The Threat Of Industrial Espionage.' As of 16 May 2019: <https://tridentresponse.com/the-threat-of-industrial-espionage/>
- Trumbo Vila, Sol & Matthijs Peters. 2016. 'The privatising Industry in Europe.' Transnational Institute Issue Brief. As of 18 May 2019: https://www.tni.org/files/publication-downloads/tni_privatising_industry_in_europe.pdf
- Tweede Kamer der Staten-Generaal. 2014. 'Frequentiebeleid; Brief van de minister van Economische zaken inzake Verwerven van overwegende zeggenschap in een telecommunicatiebedrijf dat beschikt over vitale telecommunicatie-infrastructuur.' Kamerstuk 24095 nr. 368. As of 27 February 2019: <https://zoek.officielebekendmakingen.nl/kst-24095-368.html>
- . 2017. 'Vragen gesteld door de leden der Kamer.' As of 14 August 2019: <https://www.tweedekamer.nl/downloads/document?id=9f11d008-2234-4017-83c7-49afb9684414&title=Het%20bericht%20%E2%80%98Fox%20IT%20houdt%20zeggenschap%20staat%20af%E2%80%99%20.pdf>
- . 2019. 'Brief from the Ministers of Foreign Affairs, from Education Culture and Science, of Justice, Security and State Secretary of Justice and Safety.' <https://www.tweedekamer.nl/downloads/document?id=2a712a32-8cb6-4703-891e-eb3ec0ebb4a2&title=Verscherpen%20toezicht%20op%20studenten%20en%20onderzoekers%20uit%20risicolanden.pdf>
- . 2019b. 'Maatregelen bescherming telecomnetwerken en 5G.' As of 16 August 2019: https://www.tweedekamer.nl/kamerstukken/brieven_regering/detail?id=2019Z12593&did=2019D28527
- . 2019c. 'Tweede Kamer, 102e vergadering Donderdag 4 juli 2019.' As of 16 August 2019: https://www.tweedekamer.nl/kamerstukken/plenaire_verslagen/detail/d897b734-7aa9-4b1c-a1e6-79fc3e76d75d#id51a2e06e
- UK Department for Business, Energy & Industrial Strategy. 2017. 'National Security and Infrastructure Investment Review.' As of 16 May 2019:

- <https://www.gov.uk/government/consultations/national-security-and-infrastructure-investment-review>
- UK Department for International Development. 2015. 'Why corruption matters: Understanding causes, effects and how to address them.' London: Department for International Development.
- UK Department of Health & Social Care. 2018. 'Securing cyber resilience in health and care: Progress update October 2018.' As of 27 February 2019:<https://www.gov.uk/government/publications/securing-cyber-resilience-in-health-and-care-october-2018-update>
- UK National Audit Office. 2018. 'Delivering STEM (science, technology, engineering and mathematics) skills for the economy.' As of 26 April 2019:
<https://www.nao.org.uk/wp-content/uploads/2018/01/Delivering-STEM-Science-technology-engineering-and-mathematics-skills-for-the-economy.pdf>
- UK Parliament. 2018. 'Cyber Security Skills and the UK's Critical National Infrastructure.' House of Lords & House of Commons Joint Committee on the National Security Strategy. As of 23 April 2019: <https://publications.parliament.uk/pa/jt201719/jtselect/jtnatsec/706/706.pdf>
- UK Regulators Network (UKRN). 2015. 'Innovation in regulated infrastructure sectors. Summary Report.' As of 17 May 2019:
<https://www.ukrn.org.uk/wp-content/uploads/2018/11/20150112InnovationInRegInfrSec.pdf>
- Ullman, Richard. 1983. 'Redefining Security.' *International Security* 8(1): 129–53. As of 3 December 2018: <https://muse.jhu.edu/article/446023/pdf>
- United Nations. 2017. 'Building State Prevention, Response Capacities Essential for Protecting Critical Infrastructure from Terrorist Attacks, Secretary-General Tells Security Council.' SG/SM/18436-SC/12715, 13 February. As of 16 May 2019:
<https://www.un.org/press/en/2017/sgsm18436.doc.htm>
- United States National Counterintelligence and Security Center. 2018. 'Foreign Economic Espionage in Cyberspace.' As of 23 April 2019:
<https://www.dni.gov/files/NCSC/documents/news/20180724-economic-espionage-pub.pdf>
- U.S. Department of Defense. 2019. 'Mergers and Acquisitions (M&A).' As of 16 May 2019:
<https://www.businessdefense.gov/Industrial-Assessments/Mergers-and-Acquisitions/>
- U.S. Department of Homeland Security. 2019. 'Critical Infrastructure Sectors.' As of 16 May 2019:
<https://www.dhs.gov/cisa/critical-infrastructure-sectors>
- . 2019b. 'International Critical Infrastructure Engagement.' As of 16 May 2019:
<https://www.dhs.gov/cisa/international-critical-infrastructure-engagement>
- U.S. Government Accountability Office. 2018. 'National Security: Long-Range Emerging Threats Facing the United States As Identified by Federal Agencies.' As of 16 May 2019:
<https://www.gao.gov/products/gao-19-204sp>

- . 2019. 'Ensuring the Effective Protection of Technologies Critical to U.S. National Security Interests.' As of 16 May 2019:
https://www.gao.gov/highrisk/ensuring_protection_of_technology/why_did_study
- U.S. Legal.N.d. 'National Security Law and Legal Definition'. As of 30 October 2019:
<https://definitions.uslegal.com/n/national-security/>
- U.S. National Infrastructure Advisory Council. 2009. 'Critical infrastructure resilience: Final report and recommendations.' National Infrastructure Advisory Council.
- U.S. White House. 2017. 'National Security Strategy of the United States of America 2017.' As of 30 October 2019:
<https://www.whitehouse.gov/wp-content/uploads/2017/12/NSS-Final-12-18-2017-0905.pdf>
- Ventre, Daniel. 2016. *Information Warfare*. New York: Wiley.
- Verstein, Andrew. 2017. 'The Corporate Governance of National Security.' *Washington University Law Review*, Forthcoming. As of 20 September 2019:
https://papers.ssrn.com/sol3/papers.cfm?abstract_id=3001658
- Vink, Maarten. 2005. 'What Is Europeanisation? And Other Questions on a New Research Agenda.' *European Political Science* (3). 63–74. doi:10.1057/eps.2003.36
- De Vries, C.E. & H. Solaz. 2017. 'The Electoral Consequences of Corruption.' *Annual Review of Political Science* 20:1, 391–408.
- Waeber, Ole. 1995. 'Securitization and Desecuritization.' In *On Security*, edited by Ronnie, D. & R.D. Lipschutz. New York: Columbia University Press.
- Walt, Stephen. 1991. 'The renaissance of security studies.' *International Studies Quarterly* 35(2): 211–39.
- . 2010. 'Realism and Security.' *Oxford Research Encyclopedia of International Studies*. doi:10.1093/acrefore/9780190846626.013.286
- Waltz, Kenneth. 1981. 'The Spread of Nuclear Weapons: More May Be Better: Introduction.' *Adelphi Papers* 21. doi:10.1080/05679328108457394
- . 2010. *Theory of International Politics*. Long Grove, IL: Waveland Press.
- Washington Post. 2019. 'Trump Signs Order To Protect US Networks From Foreign Espionage: A Move That Appears To Target China.' 15 May 2019. As of 17 May 2019:
https://www.washingtonpost.com/world/national-security/trump-signs-order-to-protect-us-networks-from-foreign-espionage-a-move-that-appears-to-target-china/2019/05/15/d982ec50-7727-11e9-bd25-c989555e7766_story.html?noredirect=on&utm_term=.02b08bfa1787
- Weiss, Thomas G. 2004. 'The Sunset of Humanitarian Intervention? The responsibility to protect in a unipolar era.' *Security Dialogue* 35(2): 135–53.
- Wemer, David A. 2018. 'Rick Perry to Europe: Energy Security Tantamount to National Security.' Atlantic Council, 18 September. As of 16 May 2019: <https://www.atlanticcouncil.org/blogs/new-atlanticist/rick-perry-to-europe-energy-security-tantamount-to-national-security>

- Wendt, Alexander. 1992. 'Anarchy is what States Make of it: The Social Construction of Power Politics.' *International Organization* 46(2). As of 20 September 2019: https://www.jstor.org/stable/2706858?seq=2#metadata_info_tab_contents
- Wetenschappelijke Raad voor het Regeringsbeleid (WRR). 2017. 'Veiligheid in een wereld van verbindingen. Een strategische visie op het defensiebeleid.' The Hague: Wetenschappelijke Raad voor het Regeringsbeleid.
- De Witt Wijnen, Philip. 2018. 'Geen open armen voor vreemde kopers.' 20 April, NRC. As of 28 August 2018: <https://www.nrc.nl/nieuws/2018/04/19/geen-open-armen-voor-vreemde-kopers-a1600165>
- Wolfers, Arnold. 1952. 'State understandings of 'national security'.' *Political Science Quarterly* 67(4): 481–502. <https://journals.sagepub.com/doi/abs/10.1177/048661349803000103>
- World Bank. 2011. 'World Development Report 2011: Conflict, Security and Development.' Washington, DC.
- . 2019. 'Country data – Netherlands.' As of 19 May 2019: <https://data.worldbank.org/country/netherlands?view=chart>
- World Economic Forum. 2013. 'State-owned enterprises in the global economy'. As of 7 November 2019: <https://www.weforum.org/agenda/2013/05/state-owned-enterprises-in-the-global-economy/>
- Yergin, D. 2006. 'Ensuring energy security.' *Foreign Affairs* 85(2):69–82.
- Zeniewski, Peter. 2019. 'Commentary: A long-term view of natural gas security in the European Union.' International Energy Agency, 19 March. As of 16 May 2019: <https://www.iea.org/newsroom/news/2019/march/a-long-term-view-of-natural-gas-security-in-the-european-union.html>

Annex A. List of interviewees

This Annex contains the list of interviewees consulted for the purpose of this study.

Table A.O.1. List of interviewees

| | Interviewee name | Affiliated organisation/s | Role |
|---|-------------------------|---|--|
| 1 | Anonymous | NCTV (The Dutch National Coordinator for Security and Counterterrorism) | 'Representative of NCTV' |
| 2 | Professor Robert Beeres | Netherlands Defence Academy | Academic, specialising in defence economics, performance management and burden sharing |
| 3 | Leendert Gooijer | RIVM (National Institute for Public Health and the Environment) | Programme Coordinator National Security |
| 4 | Mark Plotkin | Covington & Burling LLP, Washington, D.C. | Partner, experience in national security and foreign investment cases |
| 5 | Professor Sheila Ronis | Walsh College; Center for Complex and Strategic Decisions; The University Group | Academic and consultant |
| 6 | Hugo Rosemont | ADS Group | Director, Security & Resilience |
| 7 | Krishna Taneja | TNO | Chief of National Security |
| 8 | Anonymous | - | - |
| 9 | Anonymous | - | - |

Annex B. National security: country examples

Similar to the academic landscape examined in Chapter 2 of this report, there is no unifying definition of ‘national security’ that would be recognised by a significant number of states. Indeed, very few countries have an explicit definition of ‘national security’ in the first place, with over 50 per cent of 20 European countries not providing an explicit definition of national security within their national law.⁴⁸⁶

Given the lack of academic consensus described in Chapter 2, this lack of clarity does not come as a surprise. However, understanding how national security is conceptualised, or at least which components of national security are given prominence in national policy, can still be achieved through review of publicly available national security strategies, policies and similar documents. As discussed in Annex C, the concept of national security in the Netherlands is considered to include both ‘safety’ and ‘security’ along five dimensions: territorial security, economic security, ecological security, physical safety and social and political stability. This annex summarises the findings from such a review for a limited number of other countries, including: Australia, Canada, China, Denmark, France, Germany, Russia, Singapore, Sweden, the United Kingdom and the United States. These countries represent a non-systematic selection of exemplar countries in Europe and global powers.

Australia

Within the Australian policy context, the official understanding of national security encompasses the defence of sovereignty, as well as ensuring the wider resilience of Australia’s ‘population, assets, infrastructure and institutions’ against both direct and indirect threats.⁴⁸⁷ In 2008, the Australian Government defined national security as follows:

‘Freedom from attack or the threat of attack, the maintenance of our territorial integrity, the maintenance of our political sovereignty, the preservation of our hard won freedoms and the maintenance of our fundamental capacity to advance economic prosperity for all Australians.’⁴⁸⁸

Consistent with this understanding, the 2013 *Strategy for Australia’s National Security* defines the country’s national security interests as⁴⁸⁹:

⁴⁸⁶ Jacobsen (2013).

⁴⁸⁷ Parliament of Australia (2008).

⁴⁸⁸ Parliament of Australia (2008).

⁴⁸⁹ Australian Government (2013).

1. Ensuring the safety and resilience of the general population;
2. Protecting and strengthening Australian sovereignty;
3. Securing national assets, infrastructure and institutions; and
4. Promoting a favourable international environment.

The range of different security dimensions addressed in the 2013 strategy reveal a broad understanding of national security. The strategy is concerned with conventional and non-conventional⁴⁹⁰ threats across a range of dimensions including territorial, health, social, environmental, international and economic. The strategy states that national security is a ‘broad and evolving’ concept⁴⁹¹; this willingness to adjust its definition indicates an adaptive approach designed to enable Australia to remain resilient in a changing security environment. The strategy is considerably outward-facing in nature, with strong emphasis on international collaboration and the importance of multilateral institutions; this highlights that Australia does not view its own security as a purely national issue, but one that is inseparable from the wider global security context.

The Government of Australia exhibits a risk-based approach to national security, covering not only the range of possible security threats but also Australia’s ability to respond to them.⁴⁹² The country’s national security outlook considers the future likelihood of various events, phenomena and demands on Australia’s resources, although not in a systematic way.⁴⁹³ The strategy does not perform a quantitative assessment of likelihood or assign rankings to each threat, but instead presents a qualitative evaluation of the likelihood of specific threats.

Economic security

Australia understands its national security to be inextricably linked to economic security.⁴⁹⁴ As stated in its 2013 strategy, ‘a healthy economy underpins our stability and security, which in turn is conducive to the pursuit of our personal and national economic goals’.

Australia’s understanding of its national security as it relates to the economy is mostly situated within the country’s regional and international contexts. Australia considers its ability to shape its external environment as critical to its national security, and this in turn relies heavily on the country’s role within the global economic system; economic power is therefore regarded as a key tool for achieving security and influence.⁴⁹⁵ The 2012 White Paper *Australia in the Asian Century* identifies global economic uncertainty as one of four key trends likely to shape Australia’s national security interests in the coming years, and recent shifts in the global balance of economic power are seen as ‘possibly the most significant’ factor for

⁴⁹⁰ Non-conventional threats include terrorism, organised crime and cyber threats.

⁴⁹¹ Australian Government (2013).

⁴⁹² Australian Government (2013).

⁴⁹³ Australian Government (2013).

⁴⁹⁴ Australian Government (2013).

⁴⁹⁵ Australian Government (2012).

the country's national security.⁴⁹⁶ This approach highlights an understanding of economic security as one that is firmly situated within the global context.

One asset underpinning Australia's economy – and therefore its national security interests – is critical infrastructure.⁴⁹⁷ This is understood to encompass physical facilities, supply chains, communication networks, natural wealth and intellectual property.⁴⁹⁸ Critical infrastructure is seen as crucial to ensuring the resilience of the Australian economy, as it provides essential services upon which government, businesses and communities depend.⁴⁹⁹ The 2012 *Australia in the Asian Century* white paper identifies infrastructure as one of the foundations of a productive and resilient Australian economy which, in turn, is vital to the nation's security.⁵⁰⁰ A number of key initiatives relating to critical infrastructure feed into the country's wider security strategy, such as the *National Strategy for Disaster Resilience* and the *Critical Infrastructure Resilience Strategy*.⁵⁰¹

Canada

Canada has not released an official national security strategy or similar document since the 2004 *National Security Policy*.⁵⁰² This document sets out three core national security interests: 1) protecting Canadian citizens at home and abroad; 2) ensuring that Canada is not a base for threats to its allies; and 3) contributing to international security.⁵⁰³ This definition includes an explicit reference to the international system, linking Canada's domestic security with that of the international community. While protecting its citizens is the more important obligation of the Canadian government, an increasingly interconnected world means that Canada is affected by threats to the security of other nations.⁵⁰⁴ This highlights a highly outward-facing approach similar to that of Australia or Germany, with an understanding that the security of the individual nation-state cannot be separated from that of its allies and the wider international community.

Canada's *National Security Policy* demonstrates a risk-based approach to national security, by evaluating security threats according to both probability of occurrence and potential consequences.⁵⁰⁵ In addition to the international dimension, the other security dimensions addressed in Canada's national security policy are: intelligence; emergency planning and management; public health; transport security and border security.⁵⁰⁶ This illustrates an understanding of national security that extends beyond conventional

⁴⁹⁶ Australian Government (2012).

⁴⁹⁷ Australian Government (2010).

⁴⁹⁸ Australian Government (2013).

⁴⁹⁹ Australian Government (2010).

⁵⁰⁰ Australian Government (2012).

⁵⁰¹ Australian Government (2013).

⁵⁰² Public Safety Canada (2015).

⁵⁰³ Public Safety Canada (2015).

⁵⁰⁴ Public Safety Canada (2015).

⁵⁰⁵ Public Safety Canada (2015).

⁵⁰⁶ Public Safety Canada (2015).

security threats, but is not as broad as that of other countries considered in this annex. Dimensions such as economic, technological or environmental security receive minimal – if any – attention in the strategy.

While many new technological developments have taken place since the 2004 national security strategy, vulnerabilities in areas such as cyber and telecommunications have been recognised by the government in other publications, though not yet included in a national security strategy.⁵⁰⁷ In the absence of a more recent strategy, the Canadian Government's current understanding of national security can also be derived from its stated priorities and legislative documents. Public Safety Canada is the institution responsible for coordinating the Canadian Government's national security activities, and lists the following areas as core national security priorities: counter-terrorism; counter-proliferation; critical infrastructure; cyber security; and transportation security.⁵⁰⁸ Meanwhile, the recently adopted *Bill C-59: An Act respecting national security matters* highlights a sustained focus on the role of intelligence, international affairs and military interests within the national security framework.⁵⁰⁹

Economic security

The economy receives little mention in Canada's *National Security Policy*, although the document does refer to the threat of economic espionage by foreign actors undermining the competitiveness of Canadian businesses and impacting the country's prosperity.⁵¹⁰ Aside from this, the terms 'economy' or 'economic' appear only 10 times in the 52-page strategy, mostly as part of passing reference to the potential impact of various national disasters or security threats. The limited reference to the economic dimension in the strategy does not, however, mean that this is not considered vital to Canada's national interests. The strategy does place considerable focus on national assets that are important to the economy, such as critical infrastructure.

Amongst the key measures of the National Security Policy was the proposal of a Critical Infrastructure Protection Strategy for Canada.⁵¹¹ The subsequent strategy, released in 2009, defines critical infrastructure as 'processes, systems, facilities, technologies, networks, assets and services essential to the... security or economic well-being of Canadians and the effective functioning of Government.'⁵¹² A resilient, critical infrastructure is proven to stimulate economic growth, increase business competitiveness and foster job creation.⁵¹³ Notably, critical infrastructure is also understood as often interconnected and interdependent across national borders, a view consistent with Canada's wider, outward-facing understanding of its national security interests.⁵¹⁴

⁵⁰⁷ RAND Europe Interview with Anonymous.

⁵⁰⁸ Public Safety Canada (2018).

⁵⁰⁹ Department of Justice (2017).

⁵¹⁰ Public Safety Canada (2018).

⁵¹¹ Public Safety Canada (2018).

⁵¹² Government of Canada (2009).

⁵¹³ Government of Canada (2009).

⁵¹⁴ Government of Canada (2009).

Aside from critical infrastructure, it would appear that other economic aspects of national security are conceptualised, and therefore addressed, as a largely separate policy area. Some other national policies highlight that certain aspects of the economy are considered to be an important dimension of national security. The *National Security Review of Investments Regulations*⁵¹⁵ require a national security review process to be undertaken when investments by non-Canadians are seen as posing a potential risk to national security.⁵¹⁶

China

The Chinese understanding of national security encompasses both internal and external security; however the primary focus appears to be on the former.⁵¹⁷ The Chinese Government has traditionally viewed the country's primary security concerns as emerging mainly from internal sources.⁵¹⁸ The referent object of national security is, from the Chinese perspective, political security; namely, the security of the ruling party.⁵¹⁹ Public perceptions of security and personal safety provide a measure of state legitimacy, which in turn is closely linked to the security of the regime.⁵²⁰

China's National Security Commission is responsible for a range of areas including 'political security, homeland security, military security, economic security, cultural security, societal security, scientific and technologic security, information security, ecological security, natural resource security, [and] nuclear security', highlighting a broad understanding of the range of factors that have a bearing on the nation's security.⁵²¹ Government statements, as well as the stated priorities of the National Security Commission (NSC), indicate that China's primary security concerns are: the shifting international environment; domestic economic and social changes; and emerging 'social contradictions' or possible unrest.⁵²² Notably, the majority of these issues focus on internal stability, highlighting a state-centric understanding of national security.

China's approach to national security implies that the country views the concept as mostly confined to the nation's own interests and something that can primarily be addressed in isolation from the security of other nations; this reflects the country's focus on the ruling party as the referent object of security. Nevertheless, in the public announcement of its *National Security Strategy*, public officials stressed that China will seek to 'promote the prosperity of other countries', for example by participating in regional

⁵¹⁵ Government of Canada (2016).

⁵¹⁶ Types of investment requiring review are: the establishment of a new Canadian business or an entity carrying on operations in Canada; acquisitions of control of a Canadian business of any dollar value; and acquisitions of all or part of an entity carrying on operations in Canada. See: Government of Canada (2016).

⁵¹⁷ Sun (2013).

⁵¹⁸ Tiezzi (2015).

⁵¹⁹ Ji (2016).

⁵²⁰ Ji (2016).

⁵²¹ Sun (2013).

⁵²² Tiezzi (2015).

and global governance.⁵²³ Many overlaps can be observed between China's national security policy and its foreign policy, as the latter is also seen to be vital to the former.⁵²⁴ Therefore, China's understanding of national security is not entirely unconcerned with the wider international security dimension; however, it is evident that the country does not view its foreign relations to be as crucial to its security as comparator countries such as Australia, Canada, Denmark or Germany.

China's consistent emphasis on the political establishment as the principal point of reference in relation to national security implies an institutionalised approach to national security. This approach is highlighted, for example, by a reluctance to accept changing values or social norms within its security framework, instead highlighting social changes and a 'wealth of social contradictions' as direct threats to the country's political stability and, therefore, its national security.⁵²⁵

Economic security

China's understanding of the relationship between economic and national security is largely based on its focus on political stability as the central element of national security. Profound domestic economic changes have been highlighted as a particular area of concern for Beijing.⁵²⁶ Strategic documents acknowledge the clear links between economic insecurity and social unrest which, in turn, pose a threat to the legitimacy of the regime.⁵²⁷

China's conception of economic security can also be understood through its institutional structures. The NSC, as the body responsible for national security affairs, operates through a sub-commission system in which 'economic and human security' comprise one sub-commission (covering energy, resources, the environment and public health).⁵²⁸ The remit of this sub-commission indicates that China also includes energy and resource security within its conception of economic security. In this regard, economic security is also acknowledged to be important to the external element of China's national security interests, and vice-versa. For example, ensuring freedom of movement in the maritime domain is vital to Chinese trade; strategic documents identify this domain as particularly vulnerable in the event of heightened tensions with the US.⁵²⁹

Denmark

Taken in combination, the national security publications and institutions of Denmark reveal an understanding of national security that is broad in nature, focusing on the nation's society and its values

⁵²³ Tiezzi (2015).

⁵²⁴ Sun (2013).

⁵²⁵ Tiezzi (2015).

⁵²⁶ Teizzi (2015).

⁵²⁷ Ji (2016).

⁵²⁸ Ji (2016).

⁵²⁹ Ji (2016).

as the primary asset to be protected, and encompassing a range of policy dimensions and threats emanating both from outside and from within.⁵³⁰

Some of Denmark's strategic documents suggest an understanding of national security that is interwoven with the country's foreign and defence policy. Within the *2017 Intelligence Risk Assessment*, threats to Denmark's national security are largely regarded as emanating from wider international security trends, such as cybercrime and transnational terrorism, as well as threats posed by Russia and by migration resulting from instability in the Middle East.⁵³¹ The document is structured according to the threats emerging from seven global regions (the MENA region, North Korea, China, Russia, Afghanistan, the Arctic and Russia), and includes two additional sections focusing on terrorism and cyber security.⁵³² The approach of this document suggests an understanding of national security that is shaped by a more state-centric view, focusing on external challenges to the nation. This international focus is also demonstrated in a statement in the *2019-2020 Foreign and Security Policy Strategy*, which identifies NATO as the 'cornerstone' of Danish security.⁵³³ This also suggests that Denmark views its international alliances as a key source of its national security.

Other strategic documents, however, highlight the importance of the internal dimension to Denmark's understanding of its national security. Denmark's national security and intelligence service (PET) has a more domestic focus, with its official mission stated to be 'to identify, prevent, investigate and counter threats to the freedom, democracy and security of Danish society.'⁵³⁴ According to official PET statements, the main threats to Danish society are terrorism, political extremism and espionage.⁵³⁵ The identification of political extremism as a national security threat suggests that, similar to countries such as China and Russia, political stability is considered to be a central component of national security. Yet unlike China, Denmark employs an adaptive approach, acknowledging the changing nature of its security threats and societal values that are important to national security.⁵³⁶ This stands in stark contrast to China's institutionalised approach, which regards changing social norms or 'social contradictions' to be a security threat in themselves.⁵³⁷

Economic security

The recent Foreign and Security Policy Strategy recognises the inherent vulnerabilities associated with Denmark's reliance on other nations for its economy and security.⁵³⁸ The strategy acknowledges the country's dependence on exports and investments, with these factors comprising a vital part of the

⁵³⁰ PET (N.d.).

⁵³¹ Danish Defence Intelligence Service (2017).

⁵³² Danish Defence Intelligence Service (2017).

⁵³³ Danish Government (2018).

⁵³⁴ PET (N.d.).

⁵³⁵ PET (N.d.).

⁵³⁶ PET (2010).

⁵³⁷ Tiezzi (2015).

⁵³⁸ Danish Government (2018).

country's national security and prosperity.⁵³⁹ 'Economic diplomacy' is therefore regarded as important to Denmark's security interests, with international free trade viewed as vital to the country's small, open and export-focused economy.⁵⁴⁰ The digital economy is viewed as a particularly vital source of 'soft power' and international influence for Denmark.⁵⁴¹ Other critical sectors in terms of economic prosperity include agriculture, clean technology, food and life sciences.⁵⁴² FDI (particularly as it relates to investments in critical national infrastructure by investors with close ties to a foreign state) is seen as a possible risk to national security.⁵⁴³ Notably, the strategy generally appears to address the economy and security as two separate yet related entities; for example, by introducing discussions on the economic risks of certain international events, then following these by acknowledging that there are also security risks.⁵⁴⁴

France

France understands its own national security interests to be deeply intertwined with European security, while retaining a primary focus on its own sovereignty and independence. The French understanding of national security can be found in its most recent security strategy, *Defence and National Security Strategic Review 2017* (DNSSR).⁵⁴⁵ While the focus of the DNSSR is significantly weighted towards the geopolitical aspects of, and the contribution of defence to, national security, the document broadly understands France's national security interests to encompass all factors that contribute to the country's 'security, prosperity and influence'.⁵⁴⁶ As stated in the 2008 White Paper on Defence and National Security, and codified in law in 2009,⁵⁴⁷ the French definition of national security is broad in scope, characterised by a 'holistic' approach that entails resilience against any direct or indirect challenge that could affect the state or its citizens.⁵⁴⁸ Such national security challenges include direct hostile threats, as well as political events and natural, industrial, health and technological risks.⁵⁴⁹ In its strategic documents, France does not demonstrate a formal risk-based approach to understanding its national security interests or concerns. Instead, conducting this assessment is ultimately the responsibility of the President, who is expected to do so on a continuous basis.⁵⁵⁰

⁵³⁹ Danish Government (2018).

⁵⁴⁰ Danish Government (2018).

⁵⁴¹ Danish Government (2018).

⁵⁴² Danish Government (2018).

⁵⁴³ Danish Government (2018).

⁵⁴⁴ See, for example, the discussion on the opportunities and risks presented by climate change on page seven of the strategy. Source: Danish Government (2018).

⁵⁴⁵ Government of France (2017).

⁵⁴⁶ Government of France (2017).

⁵⁴⁷ Government of France (2013).

⁵⁴⁸ Government of France (2017).

⁵⁴⁹ Government of France (2017).

⁵⁵⁰ Government of France (2013).

French strategic documents also place considerable emphasis on the value of national sovereignty, strategic autonomy and freedom of action, with sovereignty and independence regarded as essential sources of national security.⁵⁵¹ Territorial security is also identified as a critical dimension of national security; French territorial integrity is understood as largely relying on the nuclear deterrent, which is also seen as a guarantor of sovereignty and strategic autonomy.⁵⁵² However, the definition of French security interests is not limited to the national scope and the emphasis on sovereignty and autonomy is also balanced with a recognised need for cooperation with European partners.⁵⁵³ The 2017 strategy notes that ‘France does not conceive its defence strategy in isolation’.⁵⁵⁴ As such, the French conceptualisation of national security is primarily founded on principles of sovereignty which, in turn, relies on territorial integrity, strategic autonomy and the ability to wield international influence through military power and European alliances.

Economic security

French strategic documents highlight the protection of the country’s economic interests as critical to national security.⁵⁵⁵ Although economic prosperity is acknowledged as an important dimension of security in the 1994 White Paper on Defence and Security,⁵⁵⁶ the 2008 White Paper on Defence and Security represents the first time that economic policy – alongside defence policy, domestic policy and foreign policy – is addressed as part of a whole within French national security policy.⁵⁵⁷ From 2008 onwards, economic security has been increasingly recognised as a core, indivisible component of national security in France.

The *Defence and National Security Strategic Review 2017* contains a number of references to the importance of various international security issues as relevant to French economic interests, however economic security is not addressed as a separate element in itself. This demonstrates that economic security continues to be regarded as an intrinsic part of national security. As in the 2008 White Paper, economic and national security are presented alongside one another as one and the same.⁵⁵⁸

The external element of economic security has been consistently emphasised, with the economic impact of global events or phenomena also regarded as a security threat. For example in 2008, the economic growth of emerging powers was presented as having a potentially disastrous impact on national security.⁵⁵⁹ Similarly, the *2013 White Paper on Defence and National Security* highlights the importance of protecting infrastructure and institutions that are essential to the French economy against global threats (such as cyber threats, terrorism, or natural hazards); relating to this, the importance of resource security is also

⁵⁵¹ De Spiegeleire et al. (2012).

⁵⁵² De Spiegeleire et al. (2012).

⁵⁵³ Government of France (2013).

⁵⁵⁴ Government of France (2013).

⁵⁵⁵ Government of France (2017).

⁵⁵⁶ De Spiegeleire et al. (2012).

⁵⁵⁷ Government of France (2008).

⁵⁵⁸ Government of France (2017).

⁵⁵⁹ De Spiegeleire et al. (2012).

emphasised.⁵⁶⁰ In recognition of the importance of critical infrastructure to the French economy and, therefore, its security, the *2013 White Paper on Defence and National Security* established a critical infrastructure protection policy (CIP)⁵⁶¹ that identifies sectors critical to the economy, such as energy, finance and transport.⁵⁶² Maintaining a strong defence technology industrial base (DTIB) is similarly held to be vital for maintaining France's national sovereignty and freedom of action, and this both depends on, and supports, a strong French economy.⁵⁶³

Germany

Germany's understanding of national security is intrinsically tied to the country's core values (such as human rights, democracy and the rule of law), and guided by international law and Germany's interests relative to its position within Europe.⁵⁶⁴ The *2016 White Paper on German Security Policy and the Future of the Bundeswehr* defines Germany's national security interests as follows:⁵⁶⁵

1. Protecting German citizens as well as the country's sovereignty and territorial integrity;
2. Protecting the territorial integrity, the sovereignty and the citizens of our allies; maintaining the rules-based international order on the basis of international law;
3. Ensuring prosperity through a strong German economy, as well as free and unimpeded world trade;
4. Promoting the responsible use of limited goods and scarce resources throughout the world; and
5. Deepening European integration and consolidating the transatlantic partnership.

Germany's understanding of national security is heavily focused on defence, with the Bundeswehr (armed forces) identified as a key instrument for upholding the national security interests, as presented above.⁵⁶⁶ Through these stated interests, it appears that Germany holds a considerably outward-looking understanding of its national security, indicating a keen awareness of the importance of its alliances and external challenges on the country's own security and interests. While this is balanced with a sustained emphasis on national sovereignty, it is evident that Germany considers its security as highly dependent on the security of other nations, both within and outside Europe.

The 2016 White Paper addresses a range of security dimensions covering both conventional and non-conventional threats (such as: transnational terrorism; cyber; energy security and infrastructure; climate change; health security; nuclear proliferation and changes to the international balance of power).⁵⁶⁷ The White Paper does not present a clear or systematic assessment of the risks to its national security interests,

⁵⁶⁰ Government of France (2013).

⁵⁶¹ Government of France (2013).

⁵⁶² French General Secretariat for Defence and National Security (2017).

⁵⁶³ Government of France (2017).

⁵⁶⁴ German Federal Government (2016).

⁵⁶⁵ German Federal Government (2016).

⁵⁶⁶ German Federal Government (2016).

⁵⁶⁷ German Federal Government (2016).

and does not explicitly prioritise threats according to their likelihood and potential impact. However, the strategy also contains a clear commitment to expanding its strategic foresight, measurement and evaluation approach, which suggests a shift towards a more strategic risk-based approach.⁵⁶⁸

Economic security

The 2016 White Paper places considerable emphasis on the economy, noting that Germany's economic strength and trade relations play a significant role in determining the nation's security interests.⁵⁶⁹ The approach towards the economy is considerably outward-looking, consistent with Germany's wider approach to national security. The paper largely views economic security through a European lens, acknowledging the importance of economic strength in the EU's status and influence in the international arena; in turn, Germany's security is viewed as intrinsically linked with that of its EU allies.⁵⁷⁰ A robust economy is also identified as essential to Germany's resilience against conventional and hybrid attacks.⁵⁷¹

Economic security is also viewed as closely linked with technological security, as well as the resilience of the national infrastructure that supports the country's competitiveness as an industrial nation.⁵⁷² For example, the 2013 White Paper acknowledges the importance of critical sectors' information and communications systems to its international trade and investment activities.⁵⁷³ The domestic intelligence service, *Bundesamt für Verfassungsschutz* (BfV), is particularly concerned with the threat of economic and industrial espionage by other states due to the potential impact on critical infrastructure and undermining of the international competitiveness of German industry.⁵⁷⁴ On the other hand, domestic sectors that support economic development are also seen as important tools for enhancing Germany's security. Internal socio-economic factors – such as employment, education and training – are identified as critical to social stability, particularly as they relate to counter-radicalisation; youth employment is viewed as closely linked with the prevention of violence and is therefore critical for Germany's national security.⁵⁷⁵

Russia

Russia's current security strategy provides a clear definition of the term 'national security':

'The Russian Federation's national security... the state of protection of the individual, society, and the state against internal and external threats in the process of which the exercise of the constitutional rights and freedoms of citizens of the Russian Federation... a decent quality of life and standard of living for

⁵⁶⁸ German Federal Government (2016).

⁵⁶⁹ German Federal Government (2016).

⁵⁷⁰ German Federal Government (2016).

⁵⁷¹ German Federal Government (2016).

⁵⁷² BfV (N.d).

⁵⁷³ BfV (N.d).

⁵⁷⁴ BfV (N.d).

⁵⁷⁵ BfV (N.d).

*them, sovereignty, independence, state and territorial integrity, and sustainable socioeconomic development of the Russian Federation are ensured.*⁵⁷⁶

The strategy further elaborates that:

*'National security includes the country's defence and all types of security envisioned by the Russian Federation Constitution and Russian Federation legislation – primarily state, public, informational, environmental, economic, transportation, and energy security and individual security;*⁵⁷⁷

A number of core themes run through Russia's current national security strategy, providing more nuanced insights into the country's understanding of national security. Significantly, a strong domestic focus can be observed, with only a minor part of the strategy focusing on defence and international considerations.⁵⁷⁸ While global power projection and influence are defined as one of the country's long-term security interests, the main focus of the strategy is on Russia's domestic security, with strong emphasis on national unity. Core sub-sets of Russian security are identified as: national defence; state and social security; quality of life of Russian citizens; economic growth; science, technology, and education; health; culture; and ecology and environment.⁵⁷⁹ These areas are largely weighted towards a focus to Russia's internal development, with minimal reference to its external interests.

Economic security

Economic prosperity and security are viewed as critical to Russia's national security interests, and since 2009 economic security has been considered equal to military security in terms of its importance to national security.⁵⁸⁰ Russia's security strategy places strong emphasis on economic prosperity, as it pertains to both international competitiveness and, more prominently, domestic growth and the elimination of internal regional inequalities.⁵⁸¹ Major sources of insecurity are understood to emanate from the economic sphere; in particular, internal economic disparities between regions are seen to constitute a major threat.⁵⁸² Internal inequality is associated with social tensions, which risks undermining the country's political stability and therefore its security; in this sense, comparisons can be drawn between Russia and China, where the primary goal of economic security is to ensure political stability and government legitimacy.

The strategy contains a number of ambitious economic goals relating to growth, independence, internal equality and global competitiveness.⁵⁸³ These national ambitions indicate that Russia regards economic strength as essential to its global influence and resilience to external threats, as well as its domestic stability. Vulnerabilities in the nation's financial sector and information infrastructure, as well the limited

⁵⁷⁶ Russian Federation (2015).

⁵⁷⁷ Russian Federation (2015).

⁵⁷⁸ Russian Federation (2015); Oliker (2016).

⁵⁷⁹ Oliker (2016).

⁵⁸⁰ De Spiegeleire et al. (2012).

⁵⁸¹ Oliker (2016).

⁵⁸² De Spiegeleire et al. (2012).

⁵⁸³ These goals include: raising Russian GDP to be amongst the highest in the world; increasing economic independence in key sectors such as agriculture; eliminating internal economic discrepancies between regions and individual citizens; and attracting greater foreign investment. See: Russian Federation (2015).

competitiveness of the technology sector, are identified as the main threats to the country's national security in the economic sphere.⁵⁸⁴ Key components of Russia's economic security include: the development of the industrial and technological base; the national innovation system; development of an attractive and favourable business climate; and priority sectors of the national economy.⁵⁸⁵ These priority sectors include energy, natural resources, traditional industrial sectors (such as heavy machine building and aircraft manufacturing), shipbuilding, education and transport.⁵⁸⁶ Particular emphasis is placed on energy security as a primary avenue for 'ensuring national security in the sphere of the economy'.⁵⁸⁷

Singapore

Historically, Singapore's national security approach has focused on ensuring strong defence capabilities against external, conventional military threats.⁵⁸⁸ However, since the 9/11 attacks in New York, the country has undergone a significant shift in its approach; today, the term 'national security' is generally used with reference to the threat posed by transnational terrorism. Transnational terrorism was identified in 2004 as the single greatest risk to Singapore's security, and *Singapore's National Security Strategy* is designed almost exclusively to address this threat.⁵⁸⁹ This highlights a shifting and widening of Singapore's definition of national security, from one primarily concerned with conventional threats to one that increasingly encompasses non-traditional threats. While the government does continue to acknowledge the risk of a conventional military threat, it has become increasingly concerned with non-conventional threats (primarily those posed by terrorism).⁵⁹⁰ Singapore's focus on its national security threats has undergone a considerable shift, but the referent objects that must be protected – namely, society and the economy⁵⁹¹ – are broadly similar. The country's current emphasis naturally leads to an outward-facing approach to national security, with Singapore's national interests firmly situated within the wider international security context.

In its conceptualisation of national security, Singapore no longer separates the external and internal dimensions. Instead, the country understands security threats to occur on a continuous spectrum ranging from conventional military threats to low-intensity conflict to transnational terrorist ideology.⁵⁹² Singapore manages these challenges through a whole-of-government approach (similar to that of the UK), demonstrating a recognition of the interconnections between the various national security threats and available levers of power for addressing these.⁵⁹³ Notably, however, areas such as education, housing,

⁵⁸⁴ Russian Federation (2015).

⁵⁸⁵ Russian Federation (2015).

⁵⁸⁶ Russian Federation (2015).

⁵⁸⁷ Russian Federation (2015).

⁵⁸⁸ National Security Coordination Centre (2004).

⁵⁸⁹ National Security Coordination Centre (2004).

⁵⁹⁰ Keng Yam Tan (2004).

⁵⁹¹ National Security Coordination Centre (2004).

⁵⁹² Keng Yam Tan (2004).

⁵⁹³ Keng Yam Tan (2004).

public health and economic growth are explicitly presented as policy areas that are separate to national security, and as such must compete with national security matters for government attention and resources.⁵⁹⁴ Notably, factors such as the economy, natural disasters and social stability are addressed within the framework of Singapore's 'Total Defence' which, while concerned with many areas that may typically be regarded as falling within the scope of national security,⁵⁹⁵ does not contain any reference to the term.⁵⁹⁶

Economic security

Within Singapore's national security framework, the economy is viewed as a key asset to be protected from the threat of transnational terrorism.⁵⁹⁷ Terrorist attacks are seen as having potentially 'devastating' consequences for the economy and business confidence, and economic targets are understood to be increasingly vulnerable to terror attacks.⁵⁹⁸ As mentioned above, sustainable economic growth is identified as an entirely separate policy objective to national security, and is not considered within the country's national security framework. Overall, it appears that Singapore understands the economy as an asset to be protected under that national security framework, rather than viewing economic and national security as two connected and interdependent security dimensions. Singapore's 'Total Defence' framework, on the other hand, highlights 'economic defence' as central to the country's strength and resilience.⁵⁹⁹ Within this framework, economic defence involves ensuring strong infrastructure and a resilient economy, enabled by a skilled workforce, technological development and sustainable industry.⁶⁰⁰ However, it should be noted that no explicit connection is made between economic defence and national security.

Sweden

Sweden holds a broad view of national security, based on an understanding of a wide spectrum of possible threats.⁶⁰¹ Sweden's understanding of the threats to its national security is derived from its broadly defined national interests, and the security developments that may undermine these – particularly where vulnerabilities are identified. In this regard, Sweden employs a loosely risk-based approach to national security, although its strategic documents do not provide a precise evaluation of the probability or impact of each of the threat areas.⁶⁰²

The Swedish understanding of national security encompasses not only resilience from military threats, but also from other security dimensions including: health epidemics; terrorism; organised crime; threats to

⁵⁹⁴ National Security Coordination Centre (2004).

⁵⁹⁵ Based on the national security strategies of other comparator countries examined in this annex.

⁵⁹⁶ Government of Singapore (2018).

⁵⁹⁷ Keng Yam Tan (2004).

⁵⁹⁸ Keng Yam Tan (2004).

⁵⁹⁹ Government of Singapore (2018).

⁶⁰⁰ Government of Singapore (2018).

⁶⁰¹ De Spiegeleire et al. (2012).

⁶⁰² Government Offices of Sweden (2017).

critical infrastructure, energy and resources; climate change; and international conflict or instability.⁶⁰³ The Swedish understanding of national security emphasises external considerations (such as EU and allied relations, regional stability and the rules-based global order), as well as the country's own sovereignty and right to self-determination and the rights and well-being of its citizens. The government also emphasises the links between Sweden's own domestic security and that of its neighbours and allies, in an approach that is similar to its European neighbours such as France and Germany. This suggests an implicit understanding of Sweden's national security interests as derived both from the country's own sovereignty, autonomy and internal stability, as well as from its place in wider regional and global affairs.

Unlike France and Germany, Sweden presents an understanding of national security that is comparatively less focused on the defence aspect. Although this remains critical, the strategy emphasises a 'holistic' approach that places greater weight on non-traditional security considerations.⁶⁰⁴ Sweden also places less emphasis on territorial security than other comparator countries (possibly due to its traditional position of neutrality). While the importance of maintaining territorial integrity is acknowledged as a 'necessary precondition' for Sweden's nation security, the concept receives only four mentions in the 2017 security strategy.⁶⁰⁵

Economic security

Sweden's national security strategy defines the economy and trade as part of the country's vital national interests, and states that 'long-term security requires healthy economic development'.⁶⁰⁶ The document also states that economic interdependence promotes long-term security as it relates to the country's peaceful foreign relations.⁶⁰⁷ In this regard, the economic element of national security is regarded as a key tool for maintaining Sweden's national security as it relates to safety from external threats from other states.

Industrial capacity is identified as an important source of Sweden's national power and, therefore, its security. The 2017 strategy notes that Sweden is unable to maintain its industrial base independently, meaning that ensuring a trade surplus is necessary for ensuring the country's prosperity.⁶⁰⁸ Key facets of Sweden's economic security include the energy, education and financial sectors. In addition, cyber security is expected to be of increasing importance as cyber threats to critical sectors increase in both likelihood and potential impact.⁶⁰⁹ Migration is also identified as an important factor, as the effective integration of migrants into the economy may reverse the current trends of an aging population and decreasing workforce, and mitigate the risks associated with these.⁶¹⁰

⁶⁰³ Government Offices of Sweden (2017).

⁶⁰⁴ Government Offices of Sweden (2017).

⁶⁰⁵ Government Offices of Sweden (2017).

⁶⁰⁶ Government Offices of Sweden (2017).

⁶⁰⁷ Government Offices of Sweden (2017).

⁶⁰⁸ Government Offices of Sweden (2017).

⁶⁰⁹ Government Offices of Sweden (2017).

⁶¹⁰ Government Offices of Sweden (2017).

United Kingdom

The UK's understanding of national security can be identified in the *National Security Strategy and Strategic Defence and Security Review (SDSR) 2015*.⁶¹¹ This document does not contain an explicit definition of national security; however, the UK's understanding of this term is evident through the strategic priorities expressed therein. The SDSR employs a whole-of-government approach to national security, with strong emphasis on the inextricable links between national and economic security. The document contains three overarching National Security Objectives:

1. Protect our people;
2. Project our global influence;
3. Promote our prosperity.

The UK conceptualisation of national security is wide in scope, and the current SDSR addresses both conventional and non-conventional security dimensions. Critical areas include the economy, cyber security and terrorism, with considerable emphasis also placed on critical infrastructure, organised crime, social and demographic trends and environmental hazards.⁶¹² The UK employs a risk-based approach to understanding the threats to its national security by drawing on the *National Security Risk Assessment (NSRA)*, which evaluates domestic and external risks according to both their likelihood and impact.

The UK's strategic documents have traditionally provided little distinction between matters relating to foreign or domestic policy, with equal weight given to both internal and external threats.⁶¹³ While the current SDSR acknowledges the importance of foreign relations and the security of UK allies, the weight assigned to this matter is comparatively less than that of comparator countries such as Canada or Germany. This suggests that while the UK understands the interdependencies between its own security and that of other nations, this is seen as secondary to the domestic aspect of national security.⁶¹⁴ Traditionally, the UK has also placed less emphasis on the territorial security of its mainland than countries such as Germany or France, largely due to a perception that any direct military threat is unlikely.⁶¹⁵ Similar to Sweden, this reflects the geostrategic position of the UK, and its influence on how the country understands its national security.

Economic security

The UK understands economic security to be of central importance to its national security; the first line of the foreword of the 2015 SDSR states that 'our national security depends on our economic security, and vice versa'.⁶¹⁶ Subsequently, the first priority of the UK's national security approach is to ensure the

⁶¹¹ HM Government (2015).

⁶¹² RAND Europe interview with Hugo Rosemont (2018).

⁶¹³ De Spiegeleire et al. (2012).

⁶¹⁴ HM Government (2015).

⁶¹⁵ HM Government (2015); De Spiegeleire et al. (2012).

⁶¹⁶ HM Government (2015).

continued strength of the UK economy.⁶¹⁷ The UK's understanding of its economic security is largely focused on international trade, upon which the UK's prosperity – and therefore its security – relies.⁶¹⁸ The UK's economic strength and prosperity is viewed as central to the country's ability to project its power, influence and values at the international level, for example through investment in its armed forces and security and intelligence agencies.⁶¹⁹

Critical sectors as they relate to the UK's economy and national security include: critical national infrastructure (encompassing food, water, fuel and information communications), energy, space and technology.⁶²⁰ The defence and security sectors are also identified as particularly important. Skills and training are viewed as key to supporting these sectors, and cyber security is emphasised as essential to protecting the nation's critical national infrastructure.⁶²¹

United States

The US *National Security Strategy (NSS) 2017* does not explicitly define national security; however the US understanding of the concept can be inferred from the national interests set out in the NSS.⁶²²

In the US, national security concerns are considered against a set of factors: threat, vulnerability and consequence.⁶²³ The national security objectives of the NSS are stated to be: 'protecting the American people and preserving our way of life, promoting our prosperity, preserving peace through strength, and advancing American influence in the world.'⁶²⁴ Similarly, the US Department of Defense officially defines its national security interests to include 'preserving US political identity, framework, and institutions; fostering economic well-being; and bolstering international order supporting the vital interests of the United States and its allies.'⁶²⁵ Taken together, these two sets of objectives imply that US national security is understood to encompass the safety and autonomy of citizens, economic prosperity, military power and international influence.

US national security law defines national security as 'the protection of a nation from attack or other danger by holding adequate armed forces and guarding state secrets.' The term encompasses 'economic security, monetary security, energy security, environmental security, military security, political security and security of energy and natural resources.' National security is described in US law as a 'circumstance' resulting from military or defence advantage over any other nation(s), or a foreign relations or defence

⁶¹⁷ HM Government (2015).

⁶¹⁸ HM Government (2015).

⁶¹⁹ HM Government (2015).

⁶²⁰ HM Government (2015).

⁶²¹ HM Government (2015).

⁶²² U.S. White House (2017).

⁶²³ RAND Europe interview with Anonymous.

⁶²⁴ U.S. White House (2017).

⁶²⁵ Military Factory (2019).

position capable of successfully preventing hostile or destructive action.⁶²⁶ ‘Social strength’ is also considered a critical element of national security.⁶²⁷ An alternative definition suggested by an interviewee is ‘the successful integration of all elements of national power – including the economy, diplomacy, information, rule of law’.⁶²⁸

Economic security

Historically, the definition of national security as set out in official US documents has largely centred on economic security, with particular emphasis on economic freedom.⁶²⁹ The 2017 NSS states that ‘economic security is national security’,⁶³⁰ demonstrating that the US continues to regard its economic interests as inextricably intertwined with the security of the nation as a whole. Economic security is seen as essential to protecting US citizens, supporting the ‘American way of life’ and sustaining the country’s international power and influence; factors that, as illustrated by the US national security objectives, are fundamental to national security.⁶³¹

‘Promoting American prosperity’ is one of the four pillars of the 2017 strategy, an objective that encompasses the domestic economy, external economic relations and the defence industrial base.⁶³² Since 9/11, the US understanding of national security has evolved to encompass economic factors such as critical infrastructure and, in recent years, the protection of critical technologies⁶³³ and the US ‘innovation base’.⁶³⁴ Sectors viewed as critical to the economy include telecommunications and mobile communications, manufacturing, financial services and energy.⁶³⁵ The defence industrial base is also identified as a national priority with regards to the nation’s economy and security.⁶³⁶

⁶²⁶ US Legal (N.d).

⁶²⁷ Encompassing community systems, the legal system and voter integrity. Source: RAND Europe interview with Sheila Ronis (2018).

⁶²⁸ RAND Europe interview with Sheila Ronis (2018).

⁶²⁹ De Spiegeleire et al. (2012).

⁶³⁰ De Spiegeleire et al. (2012).

⁶³¹ U.S. White House (2017).

⁶³² U.S. White House (2017).

⁶³³ Such as AI, quantum and advanced computing, gene editing, advanced materials and robotics.

⁶³⁴ RAND Europe interview with Mark Plotkin (2018).

⁶³⁵ RAND Europe interview with Mark Plotkin (2018).

⁶³⁶ RAND Europe interview with Mark Plotkin (2018).

Annex C. The approach to national security in the Netherlands

This Annex provides an overview of the current risk mitigation and risk management strategies for critical infrastructure, sectors and processes in the Netherlands.

As part of the National Security Strategy, the Netherlands takes an 'All Hazards' approach to identifying different types of threats

As noted in Chapter 2, in Dutch, both security and safety are both translated as '*veiligheid*'. '*Nationale veiligheid*' therefore refers to both security and safety, and the '*nationale veiligheidsmonitor*' explicitly includes not just threats emanating from deliberate actions, but also safety hazards such as pandemics and flooding. This so-called 'all-hazards' approach is reflected in the National Security Strategy, originally developed in 2007, which outlines the five dimensions of national security interests (as shown in Table C.0.1.).⁶³⁷

⁶³⁷ Ministerie van Buitenlandse Zaken (2019)

Table C.0.1. National security interests of the Netherlands

| National security interests | Description |
|------------------------------------|--|
| Territorial security | <p>The unimpeded functioning of the Netherlands as an independent state in the widest sense, or the territorial integrity in a narrow sense.</p> <p><i>This concerns both the physical territory and corresponding infrastructure and the image and reputation of the Netherlands.</i></p> |
| Physical safety | <p>The unimpeded functioning of people in the Netherlands and its surroundings.</p> <p><i>This concerns people's health and well-being. The criteria are numbers of fatalities and seriously injured people, and a lack of basic needs such as food, power, drinking water and adequate accommodation.</i></p> |
| Economic security | <p>The unimpeded functioning of the Netherlands as an effective and efficient economy.</p> <p><i>This concerns both economic damage (costs) and the vitality of the Dutch economy (for example a serious increase in unemployment).</i></p> |
| Ecological security | <p>The unimpeded continued existence of the natural living environment in and around the Netherlands.</p> <p><i>This concerns violations of nature, the environment and ecosystems.</i></p> |
| Social and political stability | <p>The unimpeded existence of a social climate in which individuals can function without being disturbed, and groups of people enjoy living together within the benefits of the Dutch democratic system and values shared therein.</p> <p><i>This concerns violations of freedom to act, the democratic system, the core values of Dutch society, and the occurrence or otherwise of large-scale social unrest and accompanying emotions (fear, anger, grief).</i></p> |

Source: Ministry of Justice and Security (2018).

The National Security Strategy (NSS) comprises three strands: risk assessment, capability planning and foresight.

The first strand of the National Security Strategy is the National Risk Profile (NRP) (*Nationaal Veiligheidsprofiel*), which involves a systematic and periodic assessment of the risks associated with potential threats, disasters and crises that might have a disrupting impact on society.⁶³⁸ These assessments are intended to help analyse the probability and severity of potential threats compared to one another.⁶³⁹ The disruptive impact of the identified disasters, crises and threats in this 'All Hazard' overview is measured by their impact on the five national security interests listed in Table C.0.1 above.⁶⁴⁰ The NRP analyses eight different themes, based on desk research and expert consultation, and delineates the main risks for societal disruption. The risk categories are summarised in Table C.0.2.

⁶³⁸ Rijksinstituut voor Volksgezondheid en Milieu (2016).

⁶³⁹ Rijksinstituut voor Volksgezondheid en Milieu (2016).

⁶⁴⁰ Rijksinstituut voor Volksgezondheid en Milieu (2016).

Table C.0.2. Risk categories in the National Risk Profile (NRP)

| Risk category | Description |
|--|--|
| Natural disasters | Floods (both from the sea and rivers), extreme weather events (heavy storms, snowstorms, black ice), wildfires and earthquakes can have serious consequences for society. |
| Threats to public health and the environment | Due to the possible destabilising impact, the main focus of the NRP is on the risks of a large-scale outbreak of an infectious disease, such as a flu pandemic, a zoonosis outbreak and animal disease crises. Although relevant, the potential impacts of a food crisis or an environmental disaster are estimated as being lower. |
| Major accidents | This theme covers all accidents that can result in social destabilisation, such as radiological accidents (nuclear power stations), large-scale chemical incidents and transport-related accidents. Although the chance of such accidents occurring is estimated as being extremely low, if they occur the impact can be significant. |
| Disruption of critical infrastructure | The emphasis is on the possible vulnerabilities of critical infrastructure and the potential impact of their failure. The focus in this theme is on the impact of the disruption of the infrastructure (e.g. power, ICT, (drinking) water), irrespective of the applicable circumstances and the reason for the failure (which are explored in other themes). The failure of several critical processes (as a consequence of cascading effects) has the greatest impact. |
| Cyber threats | Cyber threats are focused on disruption of digital systems and disruption of internet (capacity), as well as cyber espionage and cyber crime. Cyber incidents can cause both indirect and direct damage and destabilisation (for example due to a substantial data leak or the corruption of key systems). |
| Subversion, extremism and terrorism | This theme covers various types of social threats. The focus is on large-scale disorder, subversive practices that threaten – among other things – our open society, and (possible) consequences of extremism and terrorism. Insidious processes play a role in this, which sometimes and often unexpectedly manifest themselves in incidents such as disorder or an attack. |
| Geopolitical threats | Geopolitical threats relate to the effect of geographical factors on (international) political issues. More specifically: the battle to control land, sea and air space in order to define borders and spheres of influence. The Netherlands can become involved in various ways in threats or conflicts, which can have a destabilising effect in the event of escalation. An increasing concern is the phenomenon of hybrid threat. |
| Financial-economic threats | These threats refer to potential incidents or crises within the financial-economic system. This in particular means events that can be differentiated from the normal pattern of fluctuations in the economy, such as destabilisation of the financial system and criminal interference in the business community. |

Source: National Risk Profile (2016).

Within the National Risk Profile 2016, ‘Disruption to Critical Infrastructure’ focuses on the risks associated with the critical processes’ possible vulnerabilities and the potential impact of a partial or

complete failure. A number of scenarios are explored and assessed against their likelihood and impact, including a disruption of power supply, a disruption to satellite systems, wildfire and the cascading effects of power-supply failure. These scenarios are scored against the five vital security interests, and a number of associated criteria, as shown in Table C.0.3.

Table C.0.3. Assessment criteria for NRP scenarios

| Security interest | Criterion |
|--------------------------|---|
| Territorial | <ul style="list-style-type: none"> • Territory • International position |
| Physical | <ul style="list-style-type: none"> • Fatalities • Seriously injured and chronically ill people • A lack of life's basic necessities |
| Economic | <ul style="list-style-type: none"> • Costs • Violation of vitality |
| Ecological | <ul style="list-style-type: none"> • Violation of nature and the environment |
| Socio-political | <ul style="list-style-type: none"> • Disruption to daily life • Violation of constitutional democratic system • Societal impact |

Source: Rijksinstituut voor Volksgezondheid en Milieu (RIVM) (2016)

According to the NRP, the disruption of critical infrastructure as a thematic area is different from the others in the sense that ‘the disruption of critical infrastructure can not only constitute a threat for national security in itself, but can also have a reinforcing effect during other threats such as floods or major accidents. Disruption to critical infrastructure is therefore both a possible source of a disruption of national security and a reinforcement of the impact (the effect) of other situations.’⁶⁴¹

Indeed, the most recent National Security Strategy from 2019 highlights the disruption of vital infrastructure and processes under ‘dominant risks’ for national security.⁶⁴² This new strategy also highlights protection of vital infrastructure and processes as one of seven security areas that require a reinforced approach due to the increased threats and risks faced (the others being threats posed by other states, polarisation, terrorism and extremism, military threats, crime, cyber and digital threats).⁶⁴³ Increased efforts to ensure security of critical infrastructure and processes are identified as comprising more effective knowledge, know-how and expertise sharing among actors and the need to develop a concrete programme of action across different government departments and actors responsible for security of critical infrastructure and processes.⁶⁴⁴

⁶⁴² National Coordinator for Security and Counterterrorism (2019d).

⁶⁴³ National Coordinator for Security and Counterterrorism (2019d).

⁶⁴⁴ National Coordinator for Security and Counterterrorism (2019d).

The second strand of the National Security Strategy is capability planning. Informed by the NRP, the government produces a National Capacity Plan (NCaP), which outlines the capabilities needed to be developed or strengthened to prevent these disasters, crises and threats or ameliorate their consequences.⁶⁴⁵ The NCaP aims to identify and subsequently to develop or strengthen the capabilities required to prevent these crises or ameliorate their consequences. The final step in the Dutch National Security Strategy is to turn the identified capability gaps into policy and measures.

The final strand – foresight – is conducted through a horizon scan with the aim of identifying future and current threats and developments that may be relevant for national security in the next 1 to 5 years. In 2018, the National Network of Safety and Security Analysts (ANV) conducted this scan for the first time.⁶⁴⁶ The scan considers long-term demographic, societal, economic, political, ecological and technological developments that extend over decades and have an impact on a range of areas, activities and perceptions. Progress within the realm of the National Security Strategy gets periodically reported to the House of Representatives (*Tweede Kamer*).

While the Netherlands has a structured mechanism in place to assess risks to national security, the interactions between economic activity and national security – the scope of the study – are only a small part of the NRP assessment. Risks associated with economic activity with malicious intent (e.g. through ownership or corruption) are identified, and espionage is singled out as a particular threat. But many of the risk vectors identified in Chapter 3, such as those related to economic dependence or skills gaps, do not receive any specific attention in the NRP. For the purpose of this study therefore, we use the proposed conceptual framework to identify the risks associated with economic activities for the national security of the Netherlands.

Within the remit of the NCTV, national security focuses on intentional threat and the economy – areas where risk vectors are highly relevant

The NCTV is one of several actors within the Dutch administration responsible for implementing the *National Security and Safety Strategy*, with a delineation of responsibilities in relation to intentional threats (i.e. security-related matters) and in relation to state and non-state actors. The way in which ‘national security’ is understood within NCTV is therefore shaped by its role and responsibilities. In a broad sense, ‘national security’ is understood as the unhindered functioning of the Dutch economy and prevention of disruptions to it.⁶⁴⁷ Consequently, the mission of the NCTV can be narrowed down to the protection of Dutch critical infrastructure whose destruction could bring about a significant disruption to the Dutch economy.⁶⁴⁸

In light of global trends, such as digitalisation, networked environments, virtualisation of control systems and globalisation of supply chains, the scope of NCTV’s work in ensuring security of Dutch critical infrastructure (such as energy and telecommunications) is beginning to extend also to industries, where

⁶⁴⁵ National Coordinator for Security and Counterterrorism (2019d).

⁶⁴⁶ Rijksinstituut voor Volksgezondheid en Milieu (2018).

⁶⁴⁷ Interview with a Representative of NCTV.

⁶⁴⁸ Interview with a Representative of NCTV.

security of supply and protection of sensitive information are of critical importance for Dutch national security.⁶⁴⁹ Given the interconnectedness of the Dutch economy with the EU and the global economy, and the country's dependence on foreign investments, a fine balance is required of the Dutch administration as a whole in securing critical national infrastructure and industrial base while remaining an attractive investment destination. Indeed, 70 per cent of Dutch wealth is dependent on international activities.⁶⁵⁰ Overall, according to an NCTV representative, the government has to strike a balance between promoting prosperity and safeguarding national security.⁶⁵¹ As a result of Dutch integration within the EU and wider global economy, it is clear that economic security has become a key strategic priority of the Dutch government in recent years.

In the *Integrated International Security Strategy 2018-2022* (IISS) published in March 2018, the Rutte III coalition government reiterated the growing international interdependencies within Dutch national security.⁶⁵² 'Threats to critical economic processes' are listed as one of six most urgent security threats of the country.⁶⁵³ Despite the significant contribution foreign takeovers and investments make to the Netherlands' prosperity, the IISS advises caution with (partially) politically driven, hostile takeovers in vital sectors where the continuity of vital processes may be undermined (e.g. telecommunications, nuclear energy and ports), strategic dependency on advisory countries could occur, high-quality knowledge could be lost or the integrity of confidential information (e.g. about security installations or arrangements) could be compromised.

Protecting critical processes involves a number of actors, processes and tools but does not explicitly focus on economic risk vectors

The mission of the NCTV is to protect the Netherlands against threats that could disrupt Dutch society. Ensuring the security and resilience of the country's critical infrastructure is part of this commitment, as the failure or disruption of critical processes that depend on this critical infrastructure could lead to severe social disruption. To enable a more targeted and resource-effective protection, critical processes were identified as the area of focus within the broader resilience and protection efforts related to critical infrastructure.

Actors and tools

The resilience of critical infrastructure is safeguarded by a number of parties.⁶⁵⁴ Firstly, and most importantly, by the operators of the critical processes themselves. They are responsible for identifying, detecting and mitigating against vulnerabilities, potential threats and risks, and maintaining their resilience. Secondly, the ministries are responsible for setting regulatory standards and conducting inspections of critical infrastructure. Thirdly, in the event of an incident, operators of critical processes can receive support from Safety and Security Regions. The recently published National Security Strategy

⁶⁴⁹ Interview with a Representative of NCTV.

⁶⁵⁰ Ministerie van Buitenlandse Zaken (2013).

⁶⁵¹ Interview with a Representative of NCTV.

⁶⁵² Ministerie van Buitenlandse Zaken (2018).

⁶⁵³ Ministerie van Buitenlandse Zaken (2018, p.21).

⁶⁵⁴ National Coordinator for Security and Counterterrorism (2018).

(2019) recognises that around 80 per cent of critical processes are operated by private parties who are facing increasing threats from hostile actors – such as state actors, cyber criminals and other criminal actors – whose malicious acts could have a cascading effect due to the interdependence of systems and organisations involved in ensuring a smooth functioning of the critical processes.⁶⁵⁵

Lastly, the NCTV coordinates all efforts aimed at increasing resilience among all the many parties involved.⁶⁵⁶ Three core instruments have been designed to support operators of critical processes in increasing their resilience⁶⁵⁷:

- **Analysis of Vulnerability to Espionage (KWAS).** Together with the General Intelligence and Security Service (AIVD), the NCTV analysed the vulnerabilities that businesses and government face in a number of sectors, showing how espionage is a threat to the critical interests of the Netherlands. The KWAS offers organisations guidance on how to map their crucial interests (such as long-term strategies, blueprints, customer data, etc.) and their associated vulnerabilities with regards to espionage, enabling organisations to take necessary measures in improving their protection against espionage.
- **Manual self-analysis and follow-up actions.** A manual was produced providing information on continuity management and the impact of a disruption in the electricity and IT supply. The manual was accompanied by a tool tailored to different types of organisations, including organisations delivering critical societal functions, national government, municipalities, provinces, water boards, security regions and law enforcement.
- **VITEX-exercises (Vital Infrastructure Table-top Exercise).** During these exercises, parties that are part of the critical energy infrastructure or support its protection engage in policy discussions based on a number of scenarios. The objective of these exercises is to connect and strengthen cooperation between public and private parties, both on the regional and national level. Moreover, further insights into possible cascade effects may be gained.

To enable a coordinated, informed and swift response by all stakeholders in the event that a certain critical sector, or part of that sector, is faced with an increased terrorist threat, most of these sectors are connected to the Counterterrorism Alert System (ATb). In addition, for most critical processes, information is exchanged and cybersecurity policy discussed in a sector-specific Information Sharing & Analysis Centre (ISAC). Further coordination is provided by the National Cyber Security Centrum (NCSC), the AIVD and the National Police. Some critical processes are bound to legal obligations regarding the delivery of their services in emergency situations. For example, the drinking-water sector needs to be able to supply drinking water for a period of ten days following an incident. In the energy sector on the other hand, the sector is not obligated to provide emergency power systems to its clients. Having and maintaining emergency generators is a responsibility of the users themselves. However, there

⁶⁵⁵ National Coordinator for Security and Counterterrorism (2019d).

⁶⁵⁶ National Coordinator for Security and Counterterrorism (2018).

⁶⁵⁷ National Coordinator for Security and Counterterrorism (2018).

are some key sectors that are legally required to have adequate emergency power systems in place, such as healthcare.

Overall, cooperation between different actors is highlighted as a critical component of national resilience-building and protection of critical infrastructure and processes. Indeed, one of the key novel elements in the most recent National Security Strategy (2019) is the emphasis on a society-wide approach to risk management and the importance of different players – including the government, businesses, knowledge institutions and citizens – to both fulfil their own responsibilities and share their knowledge of threats and resilience building.⁶⁵⁸

Wider collaboration

On the whole, however, the Dutch government recognises that ensuring resilience of critical processes presupposes a high level of collaboration and coordination, including with international partners and suppliers, as critical infrastructure consists of internationally interwoven networks.⁶⁵⁹ The recent National Security Strategy 2019 reiterates the need for a proactive and continuous cooperation among public and private security partners across regional, national and international levels, particularly highlighting the need to exchange timely information.⁶⁶⁰ In this regard, the Netherlands relies on international partnerships, such as the European Union's 'Union Civil Protection Mechanism'.⁶⁶¹ This is an instrument in which Member States pool their capacity to support one another in preventing, preparing for and responding to disasters. In force since 2006, the European Programme for Critical Infrastructure Protection has also been introduced to improve European cooperation in protecting cross-border critical infrastructure networks.⁶⁶² More recently, the EU is, at the time of writing, at the brink of formally approving the EU Cybersecurity Act, which aims to set up an EU framework for cybersecurity certification.⁶⁶³

⁶⁵⁸ National Coordinator for Security and Counterterrorism (2019d).

⁶⁵⁹ Ministerie van Veiligheid en Justitie (2016).

⁶⁶⁰ National Coordinator for Security and Counterterrorism (2019d).

⁶⁶¹ European Parliament (2013).

⁶⁶² Commission of the European Communities (2006).

⁶⁶³ European Parliament News (2019).