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Steering Knowledge

The Influence of Funding Policy on
Freedom of Research



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By

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Preface

This research started as an investigation into commercialisation of universities and their evolving relationship with the world of business. Commercialisation of universities, which is often considered to significantly threaten principles of academic freedom, is not only alarming from the perspective of academics, but may also cause concern from the perspective of firms since many of the significant technological innovations of the last century were built on leaps made in our scientific understanding.

The same leaps in technological advancement that led to economic welfare and improvements in the standard of living are most often associated with equivalently significant leaps in scientific understanding, and it is under this lens that the freedom of science and academic freedom are often justified. However, as described in detail by Elizabeth Popp Berman (2013) in *Creating the market university: How academic science became an economic engine*, it is precisely the understanding of technological innovation and its academic origins which led directly to the wave of commercialisation of universities, and to science as an *economic engine*. Therefore, in transforming academia according to its role in innovation, we may be endangering the very same ability to conduct radical, ground-breaking science which led to the great technological innovations of the 20th and 21st centuries in the first place.

During this research, however, it soon became clear that the problem of understanding the effects of commercialisation on academic freedom is not only highly complex and multifaceted, but that the market might not be the optimal direction to look in when it comes to understanding this phenomenon. Instead, this research looked to identify and study an analysable, but fundamental, aspect of the commercialisation of academia. Since the commercialisation of academia seems to occur in a context of changing state-market relations. Moreover, as Berman (2013) finds, the state actively encouraged the commercialisation of universities. Therefore, redirecting focus towards the actions of the state may also contribute towards understanding the commercialisation of universities in relation to market actors.

Processes by which the commercialisation of universities take place often seem to be presented as providing increased autonomy or a greater number of choices, as in, for example, the promise for greater financial autonomy in the Bologna process (Moutsios, 2012). Therefore, academic freedom — or more generally, the freedom of academics — would not appear to suffer from the removal or lack of availability of choice but would suffer through the nature of available choices.

Therefore, if academic freedom would be affected by commercialisation, it would appear to happen, not via a direct constraint or a lack of choice, but it would happen through the structure and nature of the choices which academics are presented. Looking for a simpler scenario where academic freedom is affected in a similar manner — i.e., through the availability of choices, rather than their absence — would lead this research to look in the direction of the role of government in academia, since the government is, after all, a singular and relatively transparent actor. By looking at academic government policy, and in a context where emphasis is placed on innovation, this research was led to consider the phenomenon of national research agendas which are designed and implemented by governmental research funding institutions, such as the Dutch Research Council (NWO) in the Netherlands.

Drawing from experiences of my own and of colleagues, the research was led to focus on the effects of funding on choices made by academics and to consider the effects of government policy on the freedom of academics via these choices. In a roundabout way, this research hopes to not only examine the effects of government policy in the form of national research agendas on the (academic) freedom of researchers, but also to gain some understanding, albeit indirect, of mechanisms by which non-state actors could influence the course of academic research and academic freedom.

Martin Verweij
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Abstract

In today's knowledge economies, a significant part of academic research is funded by national research funding institutes. Research funding institutes commonly design national research agendas in an attempt to define the optimal course of research and implement them using funding strategies where some funding is locked behind thematic conditions. By enforcing research agendas, however, research funding institutions interfere with researchers' academic freedom. This research studies the relationship between researchers' freedom and research agendas through Amartya Sen's freedom of choice concept and Patrick Suppes' measure of freedom of choice. By focusing on the relationship between choices in research direction and thematic grants, this study examines how research agendas of the Dutch Research Council (NWO) influence the freedom of choice of researchers. This study also investigates the philosophical conceptions of academic freedom of Immanuel Kant, Wilhelm von Humboldt, and John Stuart Mill and compares them with freedom of choice to determine the compatibility of research agendas. This research applies the measure of freedom of choice on NWO's own funded projects to determine how NWO supports researchers' freedom of choice. The findings confirm NWO's own documentation regarding their strategies for increasing researcher freedom. Additionally, the research highlights difficulties and potential improvements in the application of freedom of choice and its measure. Based on freedom of choice and academic freedom, this study derives and studies policy strategies for increasing researchers' freedom and allowing for the design of research agendas with academic freedom in mind. Ultimately, this study presents a theoretical approach to policy regarding research agendas and underscores the importance of research freedom and academic freedom in NWO's ability to create the right research environments for impactful and innovative academic research.

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Introduction

It seems that in the knowledge economies of today, technological innovation and economic growth have become a large focus of political and policymaking debate (Berman, 2011; Edler & Fagerberg, 2017). At the same time, our scientific and economic understanding of innovation has gained a great deal of clarity in the past decades (Romer, 1989, 1992, 1994). Innovation, at least in part, is seen to depend on concrete, measurable, and controllable societal factors (Romer, 1994; Romer & Nelson, 2004; Berman, 2011). The connection between knowledge and economic growth described by economists (Romer, 1989; Aghion et al., 1998), mediated by technological innovation, carries implications that to encourage economic growth, we should pay attention to the creation and dissemination of knowledge primarily as *economic* parameters (Romer & Nelson, 2004). In particular, the implication that academic research can and should be steered towards economic ends is a view that seems to have strongly influenced western policymakers in the past decades and has led governments to construct and implement national and international research agendas (Geuna, 2001; Pereira-Puga & Sanz-Menéndez, 2024) — often through research funding institutions such as the European Commission grants and the Dutch Research Council (NWO) (Leišytė, Enders, and de Boer, 2008; Leišytė, 2016).

Research funding institutions, such as NWO, collaborate with governmental, industry, and academic stakeholders to identify key sectors or research directions (NWO, 2022).¹ Based on these collaborative efforts, research funding institutions formulate research agendas meant to describe the optimal course of research — typically in terms of international economic and academic competitiveness. Once formulated, national research agendas can be enforced by attaching thematic conditions to certain grants, thereby defining specific research topics or broader questions that researchers must address to qualify for funding. By exerting influence over thematic budgets and conditions, research funding institutions stimulate certain research directions over others, and, in the case of the NWO, “steer the course of Dutch science”².

Research agendas, however, also carry the implication that some agency over the direction of research lies with research funding institutions and the ministries of government under which they operate; and not with academia (Gläser & Laudel, 2016; Leišytė, 2016), where freedom from economic and especially political influence has historically been seen to be necessary (Jones et al., 2000). From the perspective of academic freedom, therefore, national research agendas raise critical questions regarding their compatibility and desirability (Eisenberg, 1988; Geuna, 2001; Leišytė, Enders, and de Boer, 2008; Marginson, 2008).

However, with regards to the way NWO sees and presents academic freedom and the relationship between academic freedom and research agendas, there seems to be a lack of clarity surrounding the term ‘academic freedom’. For example, in their 2023-2026 *Science works!* strategy report, NWO references the term ‘academic freedom’ several times but does not indicate that academic freedom is relevant in relation to thematic funding lines and research agendas. The kind of academic freedom that NWO references seems to include certain rights, such as the right to data (NWO, 2022, p. 12), but in the case of thematic research, NWO sees “that the subject of research is not determined by the researcher, but by others” (NWO, 2022, p. 36). Thereby, NWO does not appear to include the right to freely formulate research questions and choose

¹ See the following self-description by NWO: “NWO is a connector in the research system. It fulfils a valuable bridging function between researchers, governments, politicians, knowledge institutions, industry, and other knowledge users” (NWO, 2022, p. 15). “In 2015, we collaborated with knowledge institutions, industry, and societal organisations in drawing up the Dutch National Research Agenda” (NWO, 2022, p.15).

² This quote is taken from NWO’s mission statement, available on the homepage of NWO’s website: “The Dutch Research Council (NWO) funds top researchers, steers the course of Dutch science by means of research programmes and by managing the national knowledge infrastructure.”

topics as a part of academic freedom. Rather, the questions of how to distribute this type of agency among researchers and how much of it to distribute seem to lie in the hands of the government and geared towards achieving national academic and economic competitiveness (NWO, 2022, p. 36). However, a notion of academic freedom that is independent to agency in research direction could be at odds with the original philosophical conceptions of academic freedom.

With this, the national research agendas enforced and designed by governmental research funding institutions through conditional, thematic funding present some problems. Firstly, national research agendas could be at odds with the foundational and philosophical conceptions of academic freedom, and secondly, by placing national research agendas in a context of academic freedom that seems to be different to its various historical and conceptual understandings, a great deal of ambiguity regarding the meaning and usage of the term ‘academic freedom’ is introduced.

Understanding research agendas and their relationship with the freedom of researchers is important to academics and research funding institutes for several reasons. Firstly, from the perspective of academic freedom as an object of academic study, it is important to understand how research agendas could be (in)compatible with academic freedom, and under which conditions research agendas and academic freedom could coexist. Secondly, from the perspective of NWO, whose aim is to encourage academic and economic competitiveness — which sometimes requires leaving research to be free —,³ and from the perspective of academics, who have an interest in their ability to freely conduct research, there is a motivation, albeit instrumental in achieving economic and academic competitiveness in the case of NWO, to understand the relationship between research agendas and the freedom of researchers and to be able to study (proposed) research agendas in terms of the freedom they provide research.

Although mapping the relationship between research agendas and the (academic) freedom of researchers seems to be a worthwhile endeavour from critical and policymaking perspectives, there are notable research gaps in the detailed understanding of this relationship. While a considerable body of theoretical literature exists on academic freedom within the context of New Public Management (NPM) or neoliberalism, mainly focusing on governmental steering of research (Geuna, 2001; Leišytė, 2007; Jongbloed, 2007) and the application of principal-agent (P-A) theory in understanding the relationship between academics (agents) and the government (the principal) (Olssen & Peters, 2005; Kivistö, 2007), detailed accounts of steering mechanisms and methods for measuring and comparing research agendas with regards to the degree of freedom they afford researchers remain largely undeveloped. Rebecca Eisenberg (1988) and Stuart Marginson (2008, 2009) provide a foundational understanding, yet specific mechanisms by which research agendas can enhance or restrict freedom of research are still underexplored. This research proposes to fill this research gap by identifying and studying a concept of freedom which underpins the theoretical understanding of research agendas in the extant literature.

To start, this research starts by identifying funding lines, their budgets, and their thematic conditions as key parameters NWO uses to influence the direction of research. This research considers the effects of funding lines on the direction of research and the freedom of research through the lens of choices made by researchers. Concretely, by considering the availability of thematic funding to support research choices made in a certain direction, this research studies freedom of research under the influence of research steering by NWO.

To this end, the concept of freedom that will be taken to investigate the connection between research agendas and the freedom of researchers, mediated by choices, will be Amartya Sen’s (1988) freedom of choice concept. The effect of thematic funding of research on the freedom of choice of researchers will be investigated through the Neoclassical theory of economics, viewing researchers as rational agents motivated by utility-maximisation. Sen’s freedom of choice concept will allow this research to draw on the respectable body of theoretical literature that it has inspired — specifically, Patrick Suppes’

³ See for example page 36 of NWO’s 2023-2026 strategy outline (NWO, 2022), where NWO explains how it plans to achieve a balance between un-themed, “curiosity-driven” research and thematic, “demand-driven” research.

(1996) measure of freedom of choice — to study research agendas theoretically and measure the freedom of choice that they provide.

With this, this research has two objectives. The primary objective is to identify and study a concept of freedom (Sen's freedom of choice concept) which theoretically describes research agendas. The secondary objective of this research is to investigate the literature on philosophical conceptions of academic freedom and investigate how modern research agendas may affect academic freedom according to these conceptions. This would also aid in clarifying the theoretical and normative context in which the freedom of choice of researchers (under the influence of research steering) is introduced.

Primary Research Objective: To study a concept of freedom which theoretically underpins research agendas and research steering.

Secondary Research Objective: Through the study of a concept of freedom and a literature study of philosophical conceptions of academic freedom, to investigate how research agendas affect academic freedom according to its philosophical conceptions.

By studying the freedom of choice of researchers under the influence of research agendas, this research promises to contribute to the existing body of academic research and to the understanding of certain societal issues in several ways. Firstly, a theoretical understanding of the relationship between freedom of choice and research agendas that this research promises to contribute to could aid researchers of academic freedom in formulating precise and content-oriented analyses and criticisms of research agendas (Hölttä, 1998; Gornitzka & Maassen, 2000). Secondly, using a conceptual approach to analyse NWO's own research agendas, this research could contribute to research concerning academia and academic freedom in the Netherlands (Leišytė, Enders, and de Boer, 2008; Leišytė, 2016). Lastly, from the perspective of policy makers who see instrumental value in providing research with its own freedom, this research promises to contribute to the theoretical body of literature on academia under NPM. This latter contribution may pave the way for more precise comparative analysis between possible research agendas and could thereby aid in optimising the design of research agendas.

The secondary objective — to investigate how research agendas affect academic freedom according to its philosophical conceptions — promises to contribute to the research of academic freedom in the university under neoliberalism or NPM, (Marginson, 2009; Enders, Kehm, and Schimank, 2014) and could provide some clarity regarding academic freedom in this context. More generally, this research could contribute to research of the freedom of agents whose behaviour is steered by similar mechanisms by demonstrating a relevant context of application in steered research (Erlander, 2005).

This research will consist of six chapters, which roughly correspond to three components — providing first the conceptual context, second the historical context, and lastly the introduction and application of the freedom of choice concept and measure. The first two Chapters will provide the theoretical and conceptual context for research agendas and academic freedom. The first Chapter will mainly review Rebecca Eisenberg's (1988) *Academic Freedom and Academic Values in Sponsored Research* as a basis for understanding the effects of external research funding via NWO's research agendas on academic freedom. The second chapter will review three different and interrelated philosophical conceptualisations of academic freedom as seen by Immanuel Kant in *The Conflict of the Faculties*, Wilhelm von Humboldt in *The Limits of State Action*, and John Stuart Mill in *On liberty*. The third Chapter will focus on the historical — political and economic — context in which research agendas emerged. Centred around the work of Elizabeth Berman, whose work describes the political changes which led to 'science as an economic engine', and Paul Romer, whose work was transformational in the understanding of knowledge as an economic input, Chapter three will investigate the political context in which research agendas emerged and will aid in understanding how governments and policymakers see the role of science and freedom of research with respect to steered research. Chapters four, five, and six will consist of the

introduction of freedom of choice, the study of freedom of choice, results from the study, and discussion respectively. The results presented will come in the form of an analysis of trends in NWO's research agendas retrieved from NWO's project database and theoretically derived policymaking recommendations aimed at achieving a balance between research steering and freedom of researchers.

Research Questions

To accomplish the primary and secondary objective of the thesis — i.e., to study a concept of freedom in which theoretically describes research agendas, and to examine how research agendas affect academic freedom according to its philosophical conceptions — this research introduces the following five research questions.

RQ1: To what extent are Amartya Sen's (1998) freedom of choice concept and Suppes' (1996) measure of freedom applicable to the conditional grant system of funding research of the Dutch research funding organisation NWO?

RQ2: Based on Suppes' (1996) entropy measure of freedom, how could the freedom of choice of researchers provided by research agendas be measured and maximised?

RQ3 Based on NWO funding data, to what extent does NWO support freedom of choice as per Suppes' measure of freedom in their conditional grant system of funding research and if so, how?

RQ4: What policy recommendations for maximising freedom of choice of university researchers could be derived from the application of Suppes' (1996) measure of freedom to the Dutch conditional grant system of funding university research?

RQ5: Is 'freedom of choice', as exists in the Dutch conditional grant system, compatible with academic freedom? To the extent that the answer is negative, which dimensions of academic freedom are not captured in 'freedom of choice'?"

The first question is aimed at establishing whether Sen's freedom of choice and Suppes' measure of freedom of choice have a sound theoretical basis in describing and studying NWO's research agendas, which will be answered in Chapter four. The second and third research questions will be aimed at identifying the theoretical parameters which influence freedom of choice — how freedom of choice can be maximised in particular — and analysing the current situation in NWO's research agendas based on freedom of choice respectively, which will be answered in Chapter five. The fourth research question will be aimed at deriving policymaking recommendations for assessing and optimising research agendas and will be answered in Chapter five.

The first two research questions aim to directly contribute to accomplishing the primary objective, whereas the latter two questions aim to provide an indication of the practical validity and value of the measurement of freedom of choice with regards to NWO's research agenda. The fifth research question aims to contribute towards the secondary objective by investigating whether the strategies which increase the freedom of choice of researchers under steered research presented could mitigate or alleviate the conflict between research agendas and academic freedom.

Chapter 1

Research agendas and academic freedom

Although published in 1988, Rebecca Eisenberg's *Academic Freedom and Academic Values in Sponsored Research* manages to analyse the relationship between external, strings-attached research funding and academic freedom in a way that is relevant to this day. In the context of changing conditions regarding research funding where procuring research funding came to be a faculty and an individual task rather than a task of the university, Eisenberg questions the validity of the traditional American conception of academic freedom under the influence of external research funding; primarily from governmental or commercial sources whose funding comes with 'strings-attached' and whose interests can sometimes go against academic values. Eisenberg's central argument is that the traditional American conception of academic freedom, which places emphasis on the freedom of individual researchers with respect to their employing universities, allows external benefactors to co-opt research interests and encourage researchers to go against the academic values and social function of the academic profession which justify academic freedom in the first place.⁴

The clash between the individual liberties of academics and academic values primarily rests on two observations brought forward by Eisenberg. Firstly, Eisenberg notes that Researchers often individually depend on acquiring external funding in their ability to conduct research by, for example, relying on project grants to cover the costs of their own research (*Ibid.*, p. 1372). This dependence, she argues, exposes researchers to outside interests and professional incentives to accommodate those interests which could compromise academic values. This, in turn, means that these researchers "may not be counted on to uphold academic values on their own" (*Ibid.*, p. 1374). Seeing academic freedom primarily in terms of individual liberties of researchers misses the mark by sometimes protecting researchers even when going against academic values (*Ibid.*, pp. 1392 & 1393) and the social function of the academic profession of "expansion and free dissemination of new knowledge" (pp. 1365-1366 & 1372; AAUP, 1915, p. 294).⁵ Secondly, Eisenberg remarks that academics who are proficient in obtaining grants and outside interests tend to gain power over the university. With this, the 1915 AAUP conception of academic freedom misses the mark again by protecting researchers from the power of the university, which Eisenberg sees as losing power vis-à-vis external benefactors and those researchers proficient in obtaining grants (*Ibid.*, p. 1372).⁶

From Eisenberg's exposition of the conflict between academic values and external research funding, two elements stand out in importance. First is Eisenberg's emphasis that a narrow interpretation of academic freedom purely as the liberties of *individual* researchers is ill-suited in defending academic values from the interests of external benefactors, and, as Dean Yudof remarks:

⁴ "Moreover, the institution of faculty-procured research grants has increased the power of outside funding sources and individual faculty members relative to that of universities. These changed circumstances call for a reassessment of traditional mechanisms for preserving academic values in sponsored research" (Eisenberg, 1988, p. 1374)

⁵ Eisenberg references the following passage from the 1915 AAUP declaration: "That function is to deal at first hand, after prolonged and specialized technical training, with the sources of knowledge; and to impart the results of their own and of their fellow-specialists' investigations and reflection, both to students and to the general public, without fear or favour. The proper discharge of this function requires (among other things) that the university teacher shall be exempt from any pecuniary motive or inducement to hold, or to express, any conclusion which is not the genuine and uncoloured product of his own study or that of fellow specialists" (AAUP, 1915, p. 232).

⁶ "At the same time, universities depend on the continued flow of funds from research sponsors to reimburse them for the indirect costs of research, including fixed costs for research equipment and facilities. Faculty members doing sponsored research thus tend to gain power in their relationships with their universities. A conception of academic freedom premised on the need to protect faculty members from their all-powerful employers may therefore be beside the mark in this context." (*Ibid.*, p. 1373).

"[A] personal right to academic freedom suggests that it should prevail even where, in instrumental terms, it does not advance sound educational objectives" (Yudof quoted in Eisenberg (1988) footnote 8, 1986),

may even go against the social function of the university. The second element is the set of funding conditions under which Eisenberg sees the conflict between academic values and external research funding arise. Threats to academic values from external interests gain significance precisely when the task of procuring research funding falls on individual researchers or faculties, rather than the university.

With the considerations in mind that nowadays research funding institutions, such as NWO, predominantly fund individual projects and typically fall under the command of a ministry of government (the ministry of education in the case of NWO), the conditions of which Eisenberg speaks still seem to hold — if not that this form of research funding has become far more prevalent (Leišytė, Enders, and de Boer, 2008). Therefore, in light of national research agendas where research is increasingly⁷ funded directly by governments through research funding institutes — not universities — and where research funding is often bound by thematic conditions, Eisenberg's criticisms of external research funding with respect to academic freedom solicit a contemporary reconsideration and provide a useful theoretical frame in understanding potential effects of national research agendas on academic freedom.

Additionally, with her focus on the individual liberties of researchers Eisenberg not only shows a different side to the relationship between NWO and academic freedom, but also to the relationship between NWO's research agendas and the individual liberties of researchers. Her conclusion that academic freedom, when seen in terms of the liberties of individual researchers, is unable to defend academic values from interests of external sponsors carries important implications for NWO's research agendas, academic freedom, and the freedom of researchers more broadly. First, due to the similarity of the conditions described by Eisenberg and NWO's grant funding, her analysis and description of threats to academic values can warrant the study of NWO's research agendas and can be used in framing the study. Secondly, her focus on individual liberties provides context for the later study of the philosophical conceptions of academic freedom and measuring freedom of research under research agendas. Furthermore, her conclusion that external research sponsoring threatens academic values despite, and sometimes owing to, the emphasis on the individual liberties of researchers indicates that research agendas may also threaten academic values in spite of prevailing individual liberties of researchers.

The academic values Eisenberg observes and sees under threat are inquiry and dissemination of knowledge, scholarly investigation and reflection, critical objectivity, and academic professionalism. She groups identified threats to academic values stemming from conditional research funding into the following three categories (*Ibid.*, pp. 1373-1378).

- 1.- Secrecy of Research Results
- 2.- Distortion of the Viewpoints and Claims of Academic Researchers
- 3.- Distortion of the Academic Research Agenda

With regards to NWO's interests and funding of research, some of these concerns appear less relevant. Since NWO only funds openly published research since 2021 (NWO, 2021), Eisenberg's first concern appears to hold little relevance in this context. However, her latter two concerns, are still relevant. Especially the distortion of academic research agenda is a central concern in the case of NWO, who describe their own role in designing a national — rather than academic — research agenda. The second

⁷ In 2000 the percentage of Dutch government funds for contracted research was 8.7% of the university 'lumpsum' budget, which universities have discretion over, and includes other costs besides research funding. By 2020, this percentage had nearly doubled to 15.3% (CBS, 2023).

concern, however, that research agendas may distort researchers' viewpoints, may also be relevant in the context of research agendas which seem to prioritise some kinds of research over others.

Conditional funding — Negative liberty

When discussing the traditional American conception of academic freedom, Eisenberg refers primarily to the 1915 declaration of the American Association of University Professors (AAUP), from which she highlights two elements. First is the observation that the 1915 AAUP definition centres around *individual* faculty members.⁸ The second observation is the 1915 AAUP conception indicates that infringements of freedom come in the form of restraints or interference.⁹

By placing focus on these two characteristics of the 1915 AAUP conception of academic freedom, she seems to speak of a specific philosophical conception of freedom — namely, the concept of negative liberty according to Isaiah Berlin's (1958) understanding.

Berlin's concepts of positive and negative liberty, in much of the literature, hold the status of foundational in the understanding of positive and negative liberty — sometimes even being equated. However, despite their frequent appearance in texts across many fields and disciplines, Berlin's concepts are difficult to pin-down exactly — often appearing in seemingly contradictory ways.

In *Four Essays on Liberty* (1969), Berlin clarified with negative liberty in particular, its most common interpretation as 'the absence of interference' goes somewhat against his own interpretation of the concept. As Berlin clarifies: "the extent of a man's negative freedom is, as it were, a function of what doors, and how many are open to him; upon what prospects they are open; and how open they are" (Berlin, 1969, p. xlviii); which seems distinct to the non-interference of negative liberty. When discussing Berlin's concepts, therefore, it is necessary to distinguish clearly which interpretation is involved.

Eisenberg's essential argument is that the 1915 AAUP conception of academic freedom and its interpretation by academics is unable to defend academic values from external funding conditions. This research proposes that Berlin's negative liberty, in particular its interpretation as 'absence of interference'¹⁰ is a suitable philosophical concept of freedom to understand the type of individual freedom which Eisenberg highlights from the 1915 AAUP conception (see also footnote 8 of Eisenberg (1988)). Although various interpretations of Berlin's concepts of freedom exist in the literature, the non-interference interpretation is adopted because it seems to best align with the individual liberties of researchers Eisenberg refers to and seems to be the one adopted by many economists including Amartya Sen whose work will be studied in Chapter four.

Furthermore, the observation that, in practice, academic freedom is often presented as negative liberty, primarily as a right to non-interference in their activities, is further corroborated by observations of other researchers (Åkerlind & Kayrooz, 2003; Pascal, 2021; Zeleza, 2003). Åkerlind and Kayrooz (2003), for example, find that, when asked about the most important aspects of academic freedom, social scientists

⁸"Academic freedom is the freedom of individual faculty members to research and publish, to teach, and to speak or write as citizens outside the university" (Eisenberg, p. 1364).

⁹"Although the statement does not specify the types or sources of restraints on these activities that would constitute violations of academic freedom, its primary concern is the protection of faculty members from the universities that employ them" (Eisenberg, p. 1364). See also footnote 5 on page 1365 and page 1368.

¹⁰ As remarked by MacCallum (1967) in a criticism of Berlin's two concepts, what constitutes interference, is, to a large degree ambiguous and up to social determination. In Eisenberg's work and of others such as Amartya Sen, whose freedom of choice concept will be studied in Chapter four, a rather strict definition of the word interference seems to be adopted. For example, both authors don't seem to consider the influence on actions through economic dependence as interference.

seem to have mainly negative views on academic freedom as the absence of constraints of some kind.^{11,12} Similarly, Paul Zeleza (2003) observes that academic freedom tends to be negatively defined in western academia, and is more closely related to positive freedom in African academia.

Åkerlind and Kayrooz find that there is a significant lack of clarity when it comes to the way academic freedom is presented. Similarly, this research found that academic freedom, as a term used by policymakers and other authorities, is different to academic freedom as interpreted and experienced by scientists (Åkerlind & Kayrooz, 2003; Leišytė, Enders, and de Boer, 2008), which is also different to academic freedom as a philosophical concept. For an example of the lack of clarity surrounding the term, in their 2023-2026 strategy report NWO sees academic freedom as the following:

1. as something that must be defended in the context of ‘science diplomacy’ (p. 8);
2. as contributing to public discourse (p. 9);
3. as granting a “right to data” (p. 12);
4. as maintaining a “healthy research culture” (p. 25);
5. and as being defended by knowledge security (security from unwanted transfer of technology) (p. 28).

However, in this report, although acknowledging that thematic funding lines are inversely related to open, freely conducted research (p. 36 & 37), NWO does not acknowledge that this freedom in any way relates to academic freedom.

Amid this unclarity, nevertheless, some general findings emerge. Firstly, the perspectives of Eisenberg, Åkerlind and Kayrooz, and Zeleza indicate that academic freedom as relating to the *experience* of academics frequently comes in the form of negative liberty, i.e., that academic freedom grants the right to non-interference in their individual activities (Åkerlind & Kayrooz, 2011). Although, as remarked by Zeleza and confirmed by Eisenberg’s findings, authorities tended to define academic freedom negatively in the past, it is difficult apply the same judgment to some recent documents, particularly the financial and strategy reports of NWO and KNAW’s 2021 document on academic freedom. Nevertheless, it does seem that the perspective of non-interference in individual professional activities,¹³ and thus this aspect of academic freedom highlighted by Eisenberg, is still prevalent among policymakers and thus that negative liberty is still a relevant concept in the study of academic freedom as it appears in practice.

To conclude then, following Eisenberg, the steering of research by external funding of research seems to coexist with, and may even be enhanced by (Eisenberg, 1988, pp. 1392 & 1393), individual (negative) liberties which are often presented as academic freedom.

Conditional funding — Positive liberty

¹¹ Åkerlind and Kayrooz reference (Arthur Lovejoy, quoted in Worgul, 1992, p. 4) when observing that academic freedom tends to be presented and interpreted as a negative freedom.

¹² Åkerlind and Kayrooz find the following five ways of thinking about academic freedom among social scientists:

- (1) an absence of constraints on academics’ activities;
- (2) an absence of constraints, within certain self-regulated limits;
- (3) an absence of constraints, within certain externally-regulated limits;
- (4) an absence of constraints, combined with active institutional support; and
- (5) an absence of constraints, combined with responsibilities on the part of academics.

¹³ “The government must also respect academic freedom and refrain from interfering with aspects of research and education, such as subject matter, method, data collection, analysis, publication and quality assessment” (KNAW, 2021, p. 15).

Although negative liberty may be presented differently depending on the author, its various interpretation appears to be relatively well-defined. After all, if we for instance, can agree on a list of acts which constitute 'interference', little in non-interference view of negative liberty is left up to interpretation. The same cannot be said positive liberty as it appears in the literature.

One of positive liberty's most common definitions is its view as freedom *to*, which stands in contrast to the view of negative liberty as freedom *from*. In this view, negative liberty is the freedom from, for example, interference in pursuing one's desires. Positive liberty on the other hand, is about lacking the means or the ability to pursue those desires. What is not clear from this view however, at least not immediately so, is that positive freedom is also about the origin of one's desires — that one's desires are truly a reflection of oneself, and the best version of oneself at that (Berlin, 1958, p. 8).

In discussing the conflict between external research funding and academic freedom by referring to academic values, Eisenberg implies that academic freedom should only exist to be used in accordance with academic values, or that academic freedom — as its "individual rights interpretation" — cannot be appealed to in justifying acts that threaten academic values. Eisenberg thereby appears to imply that academic freedom has a component resembling Berlin's positive liberty — that academic freedom, to some extent, exists as a freedom *to* act in accordance with academic values. Unlike negative liberty, academic freedom according to Eisenberg is not simply a blank space to be filled in by individuals' desires, but academic freedom is also about researchers making choices and acting in accordance with academic values. With this, Eisenberg indicates that there is an aspect of academic freedom that lies closer to Berlin's concept of positive liberty, which Berlin describes as relating individuals being their "best selves" not "swept by every gust of desire" (Berlin, 1958, p.8).

When discussing the possible solution to protect academic values in the context of external research funding, Eisenberg proposes that "academic values that traditionally have justified academic freedom may be better served by institutional monitoring and control over sponsored activities than by scrupulous deference to the individual autonomy of faculty members" (Eisenberg, 1988, p. 1371). The combined implication that academic freedom has a component akin to positive liberty and that a level of institutional interference is warranted and required to maintain academic freedom would seem to fall into one of Berlin's central concerns about positive liberty — namely that positive liberty, when interpreted at a collective level, carries with it a danger of authoritarianism (Carter, 2022). With Berlin's views on positive and negative liberty in mind, difficult questions about the Eisenberg proposes are raised on possible mechanisms to counter 'authoritarian dangers', for which she seems to provide no simple solution.

Eisenberg's other remark that academic freedom should not be taken separately to academic values and that academic freedom, in some sense, exists as the freedom *to* pursue academic values, seems to highlight another aspect of positive liberty which lies closer to Immanuel Kant's conception of positive liberty which emphasises positive liberty as the ability to take moral actions.¹⁴ With regards to this side of positive liberty, another solution to the conflict between external funding and academic values may be possible.

In this light, her main concern regarding academic values mainly stems from the concern that researchers, by depending on external research funding to conduct research, cannot be considered to be autonomous and thereby lack the ability to defend academic values. In other words, researchers lack the necessary financial to make decisions regarding academic values when research financing is involved.

From this angle, perhaps greater institutional support of the financial autonomy of researchers, rather than "monitoring and control", could be a solution to protect academic values from external interests. However, going for this approach through, for example, increasing university research 'lumpsum'¹⁵ budgets to diminish reliance on external research funding would appear to lead back to one of

¹⁴ See Johannes Kreyenbühl's description of Kant's conceptions of positive and negative liberty (2023, p. 3): "If negative liberty consists in the fact that empirical causes do not completely determine us, then positive liberty consists in a peculiar way of taking initiative for one's actions from the depths of one's ethical being."

Eisenberg's starting points — that research increasingly depended on external funding; which may be an indication that this approach may be a boat that has long since sailed. Moreover, this approach raises the additional concern of whether the interests of universities are better aligned with academic values, or that universities, unlike governments and corporations, could refrain from encouraging behaviour that goes against academic values in pursuing their interests.

¹⁵ Lumpsum is the Dutch term for government funding of education where large discretionary spending power is granted to the educational institutions themselves.

Chapter 2: Academic freedom

When discussing academic freedom, it is essential to distinguish between academic freedom as a commonly used term — simply as the ‘freedom of academia’ or ‘freedom of academics’ — and between academic freedom as a philosophical concept. In light of the substantial lack of clarity surrounding the term, this chapter will investigate reviewing some conceptual perspectives on academic freedom to provide some stability in studying academic freedom. For this reason, the term academic freedom used in this research will refer to its philosophical conceptions unless stated explicitly otherwise, with clarification as to which conception when relevant.

Academic freedom as a philosophical concept has existed at least since Plato’s academy¹⁶, but in the context of the modern research university, academic freedom is widely regarded as originating in developments of 1800s German academia. If one specific time and place had to be designated as the origin of the way academic freedom often seems to be understood in practice, many would point to Wilhelm von Humboldt and his 1809-1810 reforms of the university of Berlin (Anderson, 2020) which had a lasting influence on the way universities are run today (Albritton, 2006). Regarding the Humboldt’s own philosophical thought regarding academic freedom, his book — *The Limits of State Action* — is regarded as being a valuable source of insight (Moggach, 2021; Östling, 2018). If, however, one were to trace influences to Humboldt’s conception of academic freedom, and academic freedom more generally, one would likely come across another significant event, namely Immanuel Kant’s publication of *The Conflict of the Faculties* (Bahti, 1987). Similarly, if one were to trace Humboldt’s own influence on philosophical thought of academic freedom, John Stuart Mill’s *On liberty* would stand out as another highly significant perspective (Badley, 2009). Therefore, these three conceptions of academic freedom — in chronological order: Kant’s *The Conflict of the Faculties*, Humboldt’s *The Limits of State Action*, and J. S. Mill’s *On liberty* — stand out as relevant and influential works in the history of academic freedom as a philosophical concept.

The study of academic freedom as a philosophical concept will aid this research in understanding potential threats faced by external research funding as outlined by Eisenberg. However, where Eisenberg (1988) sees the conflict between academic freedom and external research funding in terms of academic values, by reviewing these three conceptions in the history of academic freedom, this research can clarify that same conflict from a conceptual angle; thereby investigating how research agendas might infringe upon academic freedom. This conceptual approach will aid in envisaging the conceptual context for the freedom of choice concept and measure which will be introduced in Chapter four.

¹⁶ See for example this excerpt from Plato’s republic: “But when a man’s pulse is healthy and temperate, and when before going to sleep he has awakened his rational powers, and fed them on noble thoughts and enquiries, collecting himself in meditation; after having first indulged his appetites neither too much nor too little, but just enough to lay them to sleep, and prevent them and their enjoyments and pains from interfering with the higher principle—which he leaves in the solitude of pure abstraction, free to contemplate and aspire to the knowledge of the unknown, whether in past, present, or future: when again he has allayed the passionate element, if he has a quarrel against any one—I say, when, after pacifying the two irrational principles, he rouses up the third, which is reason, before he takes his rest, then, as you know, he attains truth most nearly, and is least likely to be the sport of fantastic and lawless visions” (Book IX, p. 230 - 231).

Immanuel Kant

Transcendental Freedom

Immanuel Kant's conception of academic freedom can be said to consist of two pillars. First is the view rooted in Kantian philosophy that a specific type of freedom (transcendental freedom) is a prerequisite to judgement and the ability to reason and to act ethically (Pereboom, 2006; McLearn, 2020; Fuller, 2009), and secondly there are Kant's own views on academic freedom which he elaborates in *The Conflict of the Faculties*. The connection between freedom and reason which Kantian philosophy dictates implies a connection between truth — thereby knowledge — and freedom (McLearn, 2020). In fact, this component of the Kantian understanding of academic freedom, according to Fuller (2009), is retained as a central part of Wilhelm von Humboldt's understanding of academic freedom (Fuller, 2009; Filip & Moggach, 2018).

To understand this connection between freedom, reason, and knowledge, which is extended to academia as a societal organ of reason and knowledge (Fuller, 2009), first one must look at Kant's concept of transcendental freedom. Kant's transcendental freedom, roughly stated, is one's ability to initiate action independent to causal factors — both from within and without. Transcendental freedom is the ability to abstract from empirical factors, facts about the world or about oneself, impulses such as hunger or desire, and initiate action that does not causally depend on such factors. In other words, it is the ability to act in a way that one cannot attribute the cause of one's actions to a fact about the world or oneself, but that one's action itself is its own and only cause (Pereboom, 2006; Filip and Moggach, 2018). Additionally, the ability to act ethically — i.e., to have moral autonomy — also depends on being transcendently free and is often seen as being closely related¹⁷ (Ware, 2021):

"[Ethical actions] cannot be exclusively derived from empirical motives, but that, rather, in every ethical action we transcend the empirical motivation through pleasure and pain, utility and so on" (Kreienbühl, 1882, p. 132).

As outlined by McLearn, there are a number of arguments which link transcendental freedom to reasoning and intellectual freedom, but the two arguments which seem the most relevant in this context are, what McLearn (2020) calls, the "imputability argument" and the reasoning argument. In broad strokes, the imputability argument requires agents to be transcendently free for them to be able to be held responsible for their actions — including intellectual acts such as conceptualizing, judging, inferring, or assenting (McLearn, 2020) — so that they can be the recipient of criticism or praise. The reasoning argument on the other hand, is grounded in Kant's theory of concepts. This theory sees reasoning about objects, say alternatives, as requiring a transition to, or generation of, a new mental state. This transition to, or generation of, a new mental state is under the control of the reasoning subject, and therefore requires transcendental freedom. When discussing Kant's influences in Humboldt's conception of academic freedom, Fuller explains the reasoning argument (Fuller, 2009):

"[O]ur power of discrimination is not free unless we can adopt a position from which to think about the alternatives that does not reflect any dependency on them: In other words, we can judge the alternatives in their own terms rather than based on how they impact on us".

¹⁷ Sometimes, being transcendently free is seen as being equivalent to taking moral actions — that a transcendently free being will automatically act in accordance with an ethical code. However, only the implication that being morally autonomous requires transcendental freedom is unanimously agreed upon. The implication that a transcendental freedom leads to ethical behaviour is still a topic of debate among scholars (see Ware (2021) & Pereboom (2006)).

Therefore, an essential part of Kant's understanding academic freedom, is the dependence of reasoning and other intellectual acts on transcendental freedom. Moreover, according to Fuller (2009), and Filip and Moggach (Filip & Moggach, 2018; Moggach 2021), Humboldt's own philosophy, particularly his thinking of academic freedom, is strongly marked by Kantian traits, and in particular this 'transcendental' aspect of Kant's conception of academic freedom seems to be an important part of Humboldt's conception of academic freedom as well.

The Conflict of the Faculties

Besides influencing the understanding of academic and intellectual freedom through his contributions to philosophy, one of Immanuel Kant's last major works — *The Conflict of the Faculties*, first published in 1798 — examines the freedom of the university and the relationship between its faculties and the government directly. In this relatively short publication, Kant writes about the freedom of the faculties of theology, law, medicine, and philosophy and the freedom thereof with respect to the authority of the state. Starting from the purpose of each of the faculties, Kant determines their roles with respect to each other, the people, and the state. From this, Kant derives and describes the type of freedom each faculty should have from state interference.

Kant groups the four faculties into two ranks: the 'higher' faculties of theology, law, and medicine and the lower faculty of philosophy. Whether a faculty is considered higher is determined "by the interest of the government in the content of their teachings and the way they are put forward" (Kant, 1989, p. 25). The higher faculties provide the government utility (*Ibid.*, p. 45) in ruling over its people and bringing prosperity. Specifically, Kant sees that each of the higher faculties is concerned with a particular kind of *well-being*: eternal, civic, and physical corresponding to the faculties of theology, law, and medicine respectively. The concern with well-being of the people by the higher faculties means that the teachings of the higher faculties are useful to the government in guiding, ruling, and maintaining the population (*Ibid.*, p. 33). In contrast to this, a lower faculty "occupies itself with teachings which are not adopted as directives" (*Ibid.*, p. 43). Kant sees that lower faculties have the function "to look after the interests of science and may use its own judgment about what it teaches" (*Ibid.*, p. 2).

This division of ranks among university faculties, to Kant, determines the type of freedom that should be extended to the activities of the faculties:

"Now the government is interested primarily in means for securing the strongest and most lasting influence on the people, and the subjects which the higher faculties teach are just such means. Accordingly, the government reserves the right itself to sanction¹⁸ the teachings of the higher faculties, but those of the lower faculty it leaves up to the scholars' reason" (*Ibid.*, p. 27).

By this, Kant sees that a certain amount of government interference is warranted, specifically regarding the way teachings, such as completed researches and findings, are adopted or rejected by the government. However, Kant does not see that higher faculties should be subject to *arbitrary* interference from the government. On the contrary, Kant suggests that the government, out of self-interest, should refrain from interfering with the inner workings of academia, higher and lower faculties alike:

"But even when the government sanctions teachings, it does not itself *teach*; it requires only that the respective faculties, in *expounding a subject publicly*, adopt certain teachings and exclude their

¹⁸ Kant seems to use the word 'sanction' in the sense of 'officially permit' — that the government may adopt a teaching as true. See page xvi of the introduction to *The Conflict of the Faculties* (1989).

contraries. For the government does not teach, but it commands those who, in accepting its offices, have contracted to teach what it wants (whether this be true or not). If a government were to concern itself with these teachings, and so with the growth or progress of the sciences, then it would, in the highest person, be trying to play the role of scholar, and its pedantry would only undermine the respect due it" (*Ibid.*, p. 27, emphasis in original).¹⁹

For both the lower and higher faculties, then, the government ought not to interfere with their inner workings, but for the higher faculties, the government remains free to interfere with the way teachings — i.e., scientific findings and publications — are adopted and communicated to the public. Kant implies that academia in general (higher and lower faculties) should be free from interference in the way teachings are obtained, and therefore that academic research should be free from government interference (*Ibid.*, pp. 25-32). Although it should be noted that the concern that interference with teachings could affect the (internal) growth of the sciences remains unaddressed by Kant. Only to the lower faculty, which plays an essential role in assessing the truth of the higher faculties' teachings, the government should extend a greater freedom that also contains the right to freely expound teachings to the public. The reason for the greater freedom of the lower faculty of philosophy is therefore grounded in the coming to light of truth.^{20,}
21

Kant's conception of academic freedom can be said to have three components. First there is the fundamentally Kantian understanding that reason can only be conducted from a position of transcendental freedom, which is closely related to intellectual freedom (McLear, 2020). Second, there is the more functional freedom relating specifically to non-interference in internal academic matters of the higher faculties which arises out of self-interest of the government and is a freedom that serves an *instrumental* purpose to the government. Lastly, there is the freedom of the faculty of philosophy, which guarantees that philosophy not only be free in its working, but also free in the way its teachings are expounded to the public. As opposed to the *instrumental* freedom of the higher faculties, the freedom of the faculty of philosophy seems to be grounded in philosophy being concerned with truth as an end — not with any type of utility or well-being. Because of this it is free to evaluate everything, including higher faculty teachings (Kant, 1989, p. 27), and its guarantee is grounded in the need for truth coming to light freely. Because the freedom of the faculty of philosophy is grounded in knowledge and truth as an end,²² it could be described as an *intrinsic* freedom, which stands in contrast to the *instrumental* freedom of the higher faculties which arises from the self-interest of the government and the utility the higher subjects provide the government in ruling.

¹⁹ See also: "The university would have a certain autonomy (since only scholars can pass judgment on scholars as such), and accordingly it would be authorized to perform certain functions through its *faculties*[" (Kant, 1989, p. 23).

²⁰ "So the philosophy faculty, because it must answer for the truth of the teachings it is to adopt or even allow, must be conceived as free and subject only to laws given by reason, not by the government" (Kant, 1989, p. 43).

²¹ "[...] [F]or the lower faculty has not only the title but also the duty, if not to state the *whole* truth in public, at least to see to it that everything put forward in public as a principle is true" (Kant, 1989, p. 53, emphasis in original).

²² "It is absolutely essential that the learned community at the university also contain a faculty that is independent of the government's command with regard to its teachings; one that, having no commands to give, is free to evaluate everything, and concerns itself with the interests of the sciences, that is, with truth: one in which reason is authorized to speak out publicly" (Kant, 1989, p. 27).

Wilhelm von Humboldt

In the history of academic freedom and of the university, there are few figures that appear to be as influential as Wilhelm von Humboldt. Modern research universities and systems of higher education in the United States, much of Europe, and Japan, can trace a significant amount of their origins to Humboldt's thought about the role of education which manifested in the well-known 1809-1810 reforms of the university of Berlin (Krull, 2005). For example, the Dutch higher school 'gymnasias', where some focus is placed on learning ancient Greek and Latin language and culture, appears to be highly inspired by Humboldt's similarly oriented gymnasias in Germany (Nerlich & Clarke, 2009). The changes Humboldt and many of his contemporaries brought to higher education in Prussia at the time are commonly studied as the Humboldtian model for higher education.

A defining factor of the Humboldtian model for higher education, and of Humboldt's own philosophy, is the way in which it sees the individuals and their growth. It sees the university as a space for growth and inquiry of an individual character, which extends to researchers, teachers, and students alike (Krull, 2005; Östling, 2018).

The Limits of State Action

In the study of the Humboldtian model, however, it seems difficult to separate Humboldt's own thought from influences from the government, his contemporaries, and ascriptions by later scholars of his work and the Humboldtian university as it existed (Östling, 2018). Due to various influences and concessions, studying the concept of academic freedom through the Humboldtian model for higher education is therefore quite difficult. To isolate Humboldt's own thought and what makes the Humboldtian conception of academic freedom distinct from other conceptions of academic freedom, we may focus the study academic freedom on Humboldt's *The Limits of State Action*.

In *The Limits of State Action*, starting from his views of individuals and the value of diversity, Humboldt derives a rough prescription for what activities should and should not be within the sphere of rightful state interference — the limits of the state. As a work on academic freedom, *The Limits of State Action* can be seen to provide two perspectives. First, it includes precise prescriptions over how the state should relate to societal affairs, including matters of education. Secondly, as a work of political thought, it elaborates on the relationship between individuals and authority more generally, and the role of freedom therein. This latter point seems to have been particularly relevant to the Humboldtian model of higher education (Östling, 2018).

His own views, which can be seen as the starting point of his endeavour into political thought, place centrally an Aristotelian view of individuals enriching each other's lives in society, and from that Humboldt sees value in diversity (Burrow, 1969, p. xlii). From this, the central objective of Humboldt's political thought has been described as an attempt at "creating unity in diversity" (Burrow, 1969, p. xiii). To strive towards this, and to create value in diversity, he saw that individuals ought to cultivate their unique individuality and strive for individual growth.²³

Freedom, he saw as one of the necessary conditions for growth of individuals and was therefore a precondition in maximising the value of society — the other being "variety of situation" (Humboldt, 1969, p. 3). However, with respect to the relationship between the state and freedom he saw that the state stood in fundamental opposition to freedom:

²³ "The true end of Man, or that which is prescribed by the eternal and immutable dictates of reason, and not suggested by vague and transient desires, is the highest and most harmonious development of his powers to a complete and consistent whole. Freedom is the first and indispensable condition which the possibility of such a development presupposes; but there is besides another essential — intimately connected with freedom, it is true — a variety of situations" (Humboldt, 1969, p. 16).

“Freedom is but the possibility of a various and indefinite activity; while government, or the exercise of dominion, is a single, yet real activity” (Humboldt, 1969, p. 10).

From this, Humboldt derives that the state should only be involved in matters that are necessary in the strictest sense — that is, external security and internal (legal) disputes (Humboldt, 1969, p. 43), which Humboldt refers to as ‘negative welfare’²⁴. On the other hand, matters that the state should not interfere with are what Humboldt calls ‘positive welfare’ and include matters of economics, education, and generally anything that promotes a (by the state) predetermined wellbeing. When discussing the role of the state in matters of education, Humboldt suggests that education may be better served if the state is not involved at all, and that education should be left to private initiatives.²⁵ This approach, however, could run into other complications when implemented. For instance, that universities and other educational institutions require financing is difficult to dispute. If commercial actors were left to pick up the tab (as customers or as sponsors), conflicts between commercial and academic interests might arise. The singular aim of ‘profit making’ present in (many, if not all) commercial actors could be just as conflicting with academic freedom as governments’ aim of “exercising dominion” (Humboldt, 1969, p. 10). A realisable solution to Humboldt’s problem of guaranteeing universities sufficient funding while also guaranteeing their political (and economic) independence, it appears, remains far away.

What seems to set apart Humboldt’s conception of academic freedom, however, is the role freedom plays as a *precondition* for individuals to engage in individual growth. Freedom, to Humboldt, comes with a normative implication on how it should be used. Thereby, the freedom which exists in universities as an essential part of Humboldt’s conception of academic freedom could be seen as a space for educationally and research oriented self-cultivation (Östling, 2018).²⁶

With regards to research steering by national governments, Humboldt’s work seems to indicate that it goes against principles of academic freedom. Firstly, Humboldt’s conclusion that States should refrain from involvement in matter of education altogether indicates that national research agendas could not constitute rightful state interference. Furthermore, Humboldt’s arguments against State action that defines welfare and well-being (economic welfare in particular) rather than leaving it up to the determination of individuals, seem to directly warn against research agendas which aim to define an optimal course of research to achieve economic welfare. Following Humboldt, research agendas could both infringe upon the economic freedom of individuals, and, from the perspective of the university as a place for educationally oriented self-cultivation, could also infringe upon academic freedom by predetermining the ‘desirable’ or ‘optimal’ courses of research, which should be left to the determination of individual academics.

²⁴ “I would therefore lay down as the first positive principle—a principle to be more carefully defined and limited in what follows — that the maintenance of security, both against the attacks of foreign enemies and internal dissensions constitutes the true and proper concern of the State” (Humboldt, 1969, p. 43).

²⁵ 1: “that the State must wholly refrain from every attempt to operate directly or indirectly on the morals and character of the nation, except insofar as such a policy may become inevitable as a natural consequence of its other absolutely necessary measures; and that everything calculated to promote such a design, and particularly all special supervision of education, religion, sumptuary laws, etc., lies wholly outside the limits of its legitimate activity” (Humboldt, 1969, p. 81, italic in original signifying that this is one of Humboldt’s principles).

2: “Is harmful, especially in that it hinders variety of development; useless, since there will be no lack of good private education in a nation which enjoys due freedom; effects too much, seeing that the solicitude for security does not necessitate an entire reformation of morals; it therefore lies beyond the sphere of political agency” (Humboldt, 1969, p. 4).

²⁶ In the literature on the Humboldtian model of higher education, the principles freedom in teaching and freedom in learning (*Lehr- und Lernfreiheit*), which guaranteed that teachers, researchers, and students could engage in individual learning an inquiry, are often described as being central to the academic freedom which existed in practice (Östling, 2018).

John Stuart Mill — *On liberty*

One of Wilhelm von Humboldt's most well-known contributions, particularly in the English-speaking world, are his influences on John Stuart Mill's *On liberty* (Burrow, 1969, p. vii) where J. S. Mill opens with the following passage from Humboldt's *The Limits of State Action*:

"The grand, leading principle, towards which every argument unfolded in these pages directly converges, is the absolute and essential importance of human development in its richest diversity" (Humboldt, quoted in Mill, 2001, p. 5).

J. S. Mill, here, appears to take the same starting position as Humboldt, but J. S. Mill's objective seems to be to provide a defence for liberty in a broader sense. From the perspective of academic freedom, however, Mill's defence of liberty is unique because it presents civic and political liberties — such as freedom of expression — as being closely related to the uncovering, or determining, of truth, and thus to the understanding of academic freedom (Lackey, 2018). Thus, J. S. Mill's *On liberty*, is seen to provide a powerful defence of academic freedom which rests on the importance of liberty of thought²⁷ and which rests on the same arguments as freedom of speech (Shills, 1993; Badley, 2009; Lackey, 2018).

As outlined by Jenifer Lackey (2018), Mill's defence of freedom of speech and the view that societies should not only tolerate controversial speech but embrace it rests on four main arguments. Firstly, Mill's arguments rests on the belief that all human action is subject to fallibility and that silencing opinion on the basis of any proposition is equivalent to "assuming one's own infallibility" (Mill, 2001, p. 19). Second, Mill sees that even statements that turn out to be wrong may contain — and often do contain — a portion of the truth. Thus, by silencing these wrong statements, a portion of the truth is also being silenced. Third, Mill sees that if truth is merely accepted without contestation, it will "be held in the manner of a prejudice, with little comprehension or feeling of its rational grounds" (Mill, 2001, p. 50). Lastly, Mill claims that, even when truth is known, it still requires frequent and free discussion to remain "a living truth rather than dead dogma".²⁸ Specifically, silencing opinion or discussion because it is thought to be false is undesirable because, if it were true, we would falsely suppress a truth, and if it were false we would lose "the clearer perception and livelier impression of truth, produced by its collision with error".²⁹ What becomes clear from these arguments made by J. S. Mill, however, is he sees that without freedom of expression we cannot determine truth, at least not in its best form.

Mill's conception of academic freedom, therefore, rests on the view that truth requires free discussion. Hence States must extend liberty of speech to its citizens, and especially to academia as a crucial element in society's ability to determine truth.

²⁷ "This one branch is the Liberty of Thought: from which it is impossible to separate the cognate liberty of speaking and of writing. Although these liberties, to some considerable amount, form part of the political morality of all countries which profess religious toleration and free institutions, the grounds, both philosophical and practical, on which they rest, are perhaps not so familiar to the general mind, nor so thoroughly appreciated by many even of the leaders of opinion, as might have been expected" (Mill, 2001, p. 17).

²⁸ "However unwillingly a person who has a strong opinion may admit the possibility that his opinion may be false, he ought to be moved by the consideration that, however true it may be, if it is not fully, frequently, and fearlessly discussed, it will be held as a dead dogma, not a living truth" (Mill, 2001, p. 34).

²⁹ "But the peculiar evil of silencing the expression of an opinion is, that it is robbing the human race; posterity as well as the existing generation; those who dissent from the opinion, still more than those who hold it. If the opinion is right, they are deprived of the opportunity of exchanging error for truth: if wrong, they lose, what is almost as great a benefit, the clearer perception and livelier impression of truth, produced by its collision with error" (Mill, 2001, p. 19).

Chapter 1 & 2: Conclusion

In the writings of Kant, Humboldt, and Mill, Academic freedom as a philosophical concept seems to be closely related to freedom of thought in relation with the truth. In the case of Kant and Mill (and to lesser, indirect degree Humboldt), academic freedom is warranted because ascertaining truth depends on it. For Kant, the ability to reason depends on freedom, and therefore academia, the faculty of philosophy in particular, should be free to arrive at truths obtained through reason. For Mill on the other hand, academic freedom rests on freedom of speech and freedom of thought and is warranted because without free expression, truth cannot be known in its entirety. Lastly, although Humboldt's conception of academic freedom seems to have retained a Kantian foundation (Fuller, 2009), Humboldt also sees that the university should be free because it is essential to individuals' ability to cultivate their unique individual talents, which benefits all of society.

From the perspective of these conceptions, National research agendas and their influence on academic research appear to conflict with academic freedom. According to Kant, academic freedom (of all faculties) dictates that governments should not interfere with internal academic affairs related to research and the communication of findings with other academics. However, by influencing the direction of research through direct research funding, as Eisenberg might argue, governments distort the academic research agenda. Additionally, by prioritising research directions, and potentially types of research (in methodology and approach), conditional research funding may reward researchers in a way that leads to a change in their opinions and claims as Eisenberg warns (see page 13). This could happen by direct change within individual researchers' opinions (as Eisenberg focuses on). Alternatively, systematic rewards could lead to a change in the claims of researchers as a whole by, for instance, leading to long-term shifts in the kind of research which attracts new entrants. With that, governments seem to be interfering with the way teachings are obtained, not just expounded to the public, and in academic internal academic affairs to a significant degree. Thereby, research agendas could be seen to go against academic freedom according to Kant's perspective.³⁰

From Kant's transcendental perspective which has significantly influenced Humboldt's conception (Fuller, 2009; Filip & Moggach, 2018), by providing financial incentives, national research agendas could be seen to interfere with researcher's ability to reason and to determine truth. Specifically, transcendental freedom implies that researchers should be able to abstract from (financial) impulses to be able to reason which may be difficult when, as Eisenberg (1988) observes, academics' ability to conduct research depends on external funding determined by national research agendas. Moreover, since acting according to ethical values requires transcendental freedom, research agendas may prevent researchers from being able to act in accordance with the academic values which Eisenberg (1988) refers to.

With regards to Humboldt's own philosophy, National research agendas interfere with academic freedom because national research agendas seem to enter a space that lies outside 'the limits of the state' as they can be seen to make an attempt at defining economically and academically desirable research, which, according to Humboldt, should be left to the judgment of individual academics. Lastly, from J. S. Mill's perspective, influencing academic publications by prioritising some types of publications over others through research steering could be seen as interfering with freedom of expression regarding academic publications and thereby interfering with the ability to determine truth in Mill's view.

³⁰ It could be noted here that Kant may be interpreted differently: that researches should only be free from government interference at an individual level, but not as a whole. For example, once research is commissioned, findings should be left free from interference, but the commissioning of research itself could be seen to not interfere with research. Here, however, the view that commissioning research is considered interference will be adopted because the interference that Kant specifically discusses as justifiable solely concerns the public. In particular, the way research is communicated with the public.

Chapter 3: The transition towards steered research

Introduction to Chapter three

In all three conceptions of academic freedom studied here, however, justifications for academic freedom seem to rest on certain assumptions or beliefs. In the case of Kant's transcendental freedom (and, to a lesser but definite degree, Humboldt)³¹, there is a belief in an intrinsic human potential for spontaneity³² (Filip & Moggach, 2018). For Humboldt and Mill, there is the belief that diversity is inherently valuable and that the development of individuality is desirable. For all three, and especially for Mill and Kant, the belief that truth constitutes an 'end of man' — that it is something worth pursuing for its own sake and valuable on its own — lies at the centre of their conceptions of academic freedom.

In *Creating the Market University*, Berman describes a transition regarding government's view of academia, where the pursuit of knowledge, seen in the 1950s and 1960s as valuable for its own sake (Berman, 2013, p. 19), in the 1970s and 1980s, came to be seen as an economic resource by policymakers (*Ibid.*, p. 30). Berman traces this transition in part to the rise of neoliberalism in western countries (*Ibid.*, p. 173) but also to a distinct political shift where economic growth came to increasingly be seen as a legitimate political goal (*Ibid.*, p. 175). This meant that, when theorists at the time, such as Paul Romer, made advances in the understanding of knowledge, innovation, and economic growth (Romer, 1989), policymakers were encouraged to see science as an economic input (Berman, 2013, p. 175). However, since this new view of science and academia appears to be related to some of the assumptions and views that conceptions of academic freedom are built on, some questions regarding academic freedom are raised.

Moreover, steering of research by NWO in the Netherlands, and elsewhere in Europe, emerged in similar political and economic contexts to the ones described by Berman (Jongbloed, 2007; Gläser & Laudel, 2016). There appear to be three elements to the historical context in which the steering of research by governments via research agendas emerged. First is the rise of Neoliberalism as a political movement in western countries. Second is the rise of economic growth as a widespread political goal which Berman describes as *economic rationalisation* (Berman, 2013, p. 175) and third are the advances in economic theory in the understanding of knowledge (Romer, 1989; Aghion et al., 1998), which together led to science as an economic engine (Berman, 2013, p. 173). With this, this chapter will review some literature relating to the first two points centred around Berman's (2013) *Creating the Market University* and then Paul Romer's contributions to the economic understanding of knowledge, primarily in the theory of endogenous growth as expressed in *Endogenous Technological Change* (Romer, 1989; Jones, 2019), which according to Berman would shape the perspective of research policy.

The neoliberal market university: academic science as an economic engine

The transference of research agency — specifically, the ability to freely choose research topics and questions — from universities (and to some degree, individual researchers) to governmental research funding institutions — NWO, for example — is a process that appears to have taken place in a broader transition of the relationship between the university and the economy, and particularly the way in which governments run public institutions, such as universities.

³¹ See Filip and Moggach (2018) and Moggach (2021).

³² Transcendental freedom is sometimes also called spontaneous freedom. Specifically, the ability to initiate action out of oneself is what is often meant with 'spontaneity' in this context.

In *Creating the Market University: How Academic Science became an Economic Engine*, Elizabeth Popp Berman sets out to investigate the broader context of this transition and finds that the transition towards the ‘market university’ where science is seen mainly as an economic resource (Berman, 2013, p. 3), boils down to two reasons. The first reason is that government policies — not initiatives from within the university or from the market — were the main driving factor in encouraging the growth and adoption of small-scale commercially-oriented activities (*Ibid.*, p. 12). Although not directly relevant to the steering of research as done by NWO, as Berman explains, these changes paved the way for further government intervention in academic matters.³³ The second reason Berman finds is that this change in government policy is attributed to policymakers embracing the idea that scientific and technological innovation drive the economy (*Ibid.*, p. 12).

At the same time, Berman traces the changes in policy to a relatively small window between the 70s and 80s (*Ibid.*, p. 11) — a time in which politicians in western nations, led by the United States and the United Kingdom, began to adopt new policies in running and managing public organisations. The change in the political landscape is often assigned the term ‘neoliberalism’ and is associated with the view that the free market is a superior way of organising economic activity (*Ibid.*, p. 11).³⁴ In this political context, public organisations, such as universities, were introduced to management models from the private sector to make them more ‘business-like’. The process by which public organisations adopted private sector management techniques in particular is termed ‘New Public Management’ (NPM), to which Leišytė (2006 & 2007) and Jongbloed (2007) have traced the introduction of research steering by the Dutch government through NWO. Additionally, Gläser and Laudel (2016) have concluded NPM brought similar research policy efforts in OECD countries more generally.

From the perspective of the social sciences, neoliberalism is seen to have many effects, not least of which is altering the way people “interpret, live in and understand the world” (Houghton, 2019). Specifically, in Houghton’s study of the Neoliberalisation of academia, she contends that students and researchers have been encouraged to think of themselves as entrepreneurs, “being one’s own ‘capital ... producer ... [and] source of earnings’” (Houghton, quoting Foucault (2010), 2019).

However, Berman stresses that the political and social processes of Neoliberalisation can only partially explain the emergence of the market university (Berman, 2013, p. 173). Berman claims that, besides neoliberalism, a change in what constitutes a viable end for political action is needed to explain the transition towards the market university.

The change Berman identifies is an increased economic framing of political issues. In turn, this led to economic welfare and international competitiveness becoming a core purpose of government and meant that political issues were increasingly seen and presented from an economic perspective — a process which she calls *economic rationalisation* (*Ibid.*, p. 175). This process of economic rationalisation meant that, by explaining the relationship between academic science, innovation, and economic growth, economists would provide justification for policymakers in adopting policies that strengthened innovation, which, in turn, encouraged activity that tended to see science as an economic input (*Ibid.*, p. 175).

The historic context in which research agendas were introduced, then, has several important components. Research agendas were introduced at a time when the neoliberal movement had grown in its influence over policymakers with respect to much of western academia. Under neoliberalism, public organisations, including many universities in Europe and the Netherlands (Gläser & Laudel, 2016; Leišytė,

³³ In addition, many of the small-scale commercially oriented changes that Berman describes appear to have had Dutch equivalents with Biotech at Wageningen university standing out (van den Belt et al., 2008).

³⁴ As Berman and many others have remarked, there is a lack clarity surrounding the term ‘neoliberalism’, which is sometimes taken as an increase in economic rationalisation — not necessarily having to do with free markets. The lack of clarity surrounding the term seems to, in part, be due to neoliberalism referring to both the economic theory (developed by the likes of Friedrich A. Hayek, Milton Friedman, and James Buchanan), and the political movement which at various points seems to have taken inspiration from the economic theory but has also deviated from it.

2006 & 2007), underwent reforms of New Public Management (NPM). From the perspective of social sciences, neoliberalism also encourages students and researchers to see themselves as ‘entrepreneurs of themselves’ (Houghton, 2019). However, to fully explain how science became an economic engine and to understand the context in which research agendas came to be, following Berman, one should also look to the process of economic rationalisation by which political issues gained an economic framing. This latter point is crucial to Berman because it implies that any economic theory that describes a link between academia and economic growth is more likely to justify government interference in academia (Berman, 2013, p. 177) — for example: the implementation of national research agendas.

Knowledge and economic growth — endogenous growth theory

To get a better grasp of the effects on academia of economic rationalisation to which Berman refers, it is beneficial to understand how the economic understanding of knowledge has changed in the past four (or so) decades. Starting in the 1960s with the work of, among others, Kenneth Arrow, economists grew increasingly dissatisfied with the then current theories of economic growth, where economic growth was seen to be fully dependent on exogenously given parameters and not integrated within economic theory. Instead, economists wanted to describe economic growth in terms internal to economic theory. The overarching goal of endogenous growth theories, and especially the work of Paul Romer who continued the efforts started in the 1960s, was to answer the question “what determines the long-term rate of economic growth in living standards?” (Jones, 2019; Romer, 1987).

In the study of endogenous growth theories, three key concepts seem to always make an appearance: knowledge, technology, and innovation. Romer, whose work led to the 2018 Sveriges Riksbank prize in economics (often called the Nobel prize in economics), is seen by economists to have been able to precisely capture a crucial part of the economic essence of ideas and knowledge.

Although Berman does not specifically refer to Romer, she does refer to other economists in related fields of study and who have collaborated with Romer (Kenneth Arrow and Richard Nelson) (Romer & Nelson, 2006; Berman, 2013, p. 46 & 174). With this, Romer’s work can serve to provide crucial insight into the kind of economic understanding which Berman has linked with the emergence of science as an economic engine.

Romer’s most significant and unique contribution to the economic understanding of ideas rests on the view that ideas are, in theory, perfect non-rivalrous goods (Romer, 1989; Jones, 2019) — nonrivalry referring to the characteristic that the use of an idea by someone cannot prevent others from using the same idea. This stands in contrast to rivalrous economic goods (all physical objects to a certain extent) where the usage of one economic good, say a bottle of water, necessarily prevents another from making use of that same good (drinking the same bottle of water).

Using the insight that ideas, as opposed to objects, are not subject to restrictions on the number of repetitions and simultaneous uses due to nonrivalry, Romer showed that the long-run exponential economic growth, which was seen to hold across many countries and that exogenous growth theories could not explain, could be explained if ideas were seen to have, or lead to, economic value (Romer, 1989). This latter view, that ideas have or lead to economic value, Romer (1989) integrated as an assumption in *Endogenous Technological Change* (see footnote 35).

Romer’s derivation can be understood by following what is called the replication argument. In replicating, for instance, a production plant, the same blueprints (which represent knowledge and/or ideas) do not have to be drafted a second time, yet production capacity is doubled. If then, investments are made to increase by some factor both the number physical objects (machines) and the availability of ideas (designs, plans, etc), then, since ideas were assumed to lead to additional output, total output must increase by a factor larger than the increase of the factor by which each was increased individually (objects and ideas). In other words, there is an increasing returns-on-investment on ideas and objects taken

together.³⁵ This derivation was able to provide to lead to a suitable explanation for the long-run exponential growth which had been observed for decades and was missing an adequate explanation.³⁶ This contribution of Romer to the understanding of knowledge is therefore that ideas are, by nature, nonrival and that this property of ideas combined with an assumption of their productivity³⁷ inevitably leads to increasing returns-to-scale and can explain long-run exponential growth.

With regards to policymaking in the space of the production of ideas and knowledge — among others, in entrepreneurship and in research — and building on the previous insight of the economic significance of ideas, Romer was also able to provide concrete guidelines for policymakers. Specifically, after integrating Romer's initial insight that ideas could drive economic growth, further work by economists would imply that the natural, purely competitive, allocation of resources could not be optimal (Jones, 2019). Therefore, to achieve an economic optimum, it was seen necessary to engage in some form centralized control over the allocation of resources. The view that ideas necessarily contribute positively to economic growth would seem to directly lead to the conclusion that governments and policymakers are actively needed in the process of the distribution of resources, and that "An unregulated economy is no longer the best of possible worlds" (Jones, 2019).

Romer also noted that knowledge, although nonrival, due to, for example the acts of patenting and keeping trade secrets, is somewhat excludable (Romer, 1989, p. 4).³⁸ Seeing that technological change — which drives economic growth —³⁹ uses knowledge as an input and arises largely from the initiatives of self-interested individuals, Romer sketched a place for policymaking: namely that policymaking ought to optimise profit incentives, patenting, and other monopoly rights such that maximising, self-interested innovators and entrepreneurial researchers are sufficiently drawn to produce new ideas (Jones, 2019). Thereby, Romer's other contribution to the understanding of knowledge as an economic input is that policymakers ought to strengthen monopoly rights (such as patenting laws) if an economically optimal situation is to be desired — not promote freedom of the market. With regards to researchers, who by Romer's theory are equally important in creating new ideas, as Jones (2019) explains, Romer's work in endogenous growth implies that we ought to see them more as entrepreneurs and provide them with similar profit incentives.

To recapitulate, Romer's work in the economic theory endogenous growth, which according to Berman's observation (Berman, 2013, p. 155) would strengthen the view of science as an economic input, has two main contributions. First is Romer's view of the idea as an economic good and the implication that economic growth fundamentally derives from the economic value of ideas. Second is the view that, when it

³⁵ The mathematical derivation is as follows. Take $Y = F(A, X)$ to be a production process with yield Y be equal to the function of nonrival inputs A (knowledge) and rival inputs X (objects). Then from the replication argument follows that increasing the scale of X by some factor ∂ will lead to constant returns to scale, i.e., $F(A, \partial X) = \partial Y$. Therefore any increase in scale in both X and A will yield increasing returns to *total* scale, i.e., for some increase ∂ we necessarily have $F(\partial A, \partial X) > \partial Y$. See also Jones (2019) or the original derivation in Romer (1989).

³⁶ As presented by Charles Jones (2019), increasing returns-to-scale does not necessarily lead to long-run exponential growth, but was derived by Romer in later work, however, for the sake of this research it is only important that Romer contributed significantly to linking the economic value of the idea to economic growth which was sought after by economists and policymakers alike.

³⁷ See page 7 of *Endogenous Technological Change* by Romer (1989).

³⁸ See page 4 of *Endogenous Technological Change* (Romer, 1989): "Excludability is a function of both the technology and the legal system. A good is excludable if the owner of the good can prevent others from using it. A good like the code for a computer program can be made excludable by means of a Legal system that sanctions copying or by means of encryption and copy protection schemes."

³⁹ This is one of the assumptions with which Romer formulates the theory of endogenous growth — the other two being that innovators are self-interested profit-seekers and that a defining characteristic of technology is its dependence on the nonrival good of knowledge; see pages 1-3 of Romer (1989).

comes to the production of new ideas, new ideas were produced by initiatives of self-interested individuals — i.e., entrepreneurs and “entrepreneurial researchers” (Jones, 2019) —, and as such, policymakers ought to provide profit incentives to encourage the production of ideas.

Chapter 4: Academics' freedom of choice

Fitting freedom of choice

Understanding the societal context in which research agendas emerged is beneficial, not only because it elucidates a change in academic freedom — at least, as seen by governments —, but also because it aids in understanding the theoretical context in which research agendas were introduced. The latter proves to be essential in attempting to theoretically describe the freedom of researchers under the influence of research steering.

From the contextual investigation in Chapter three, some key findings emerged. The introduction of research agendas and research steering came as part of the broader neoliberal political movement and changes within the university and the way it relates to society — the private sector in particular. In the movement known as New Public Management (NPM), neoliberal policymaking introduced management techniques from the private sector in managing universities, academics, and research (Gläser & Laudel, 2016; Enders, Kehm, and Schimank, 2014). Moreover, steering through research agendas specifically in the Netherlands has been described and studied as part of NPM (Jongbloed, 2007; Leišytė, 2006 & 2007). In addition to this, the view that academics are encouraged to see themselves as entrepreneurs and engage in 'maximising behaviour' has also been studied from the perspective of social scientists in the study of neoliberal governmentality (Houghton, 2019; McNay, 2009; Lorenzini, 2020). In other studies, the relationship between individual researchers and the government has been theoretically described by the principal agent (P-A) theory where the agents (researchers or universities) are seen as rational and maximising some utility which is steered through incentive structures imposed by the principal (the government and NWO) (Gläser & Laudel, 2016; Olssen & Peters, 2005; Kivistö, 2007).

Linking to the extant literature, this research will take the P-A model as a theoretical basis to understand the relationship between researchers and NWO by seeing individual researchers as the maximising agents who conduct research on behalf of NWO (the principal). By seeing NWO to provide the incentive structures, through funding and the national research agenda, which steer maximising behaviour of researchers through thematic funding lines, the P-A model allows for a theoretical frame in which to consider the freedom of researchers and its relationship with research agendas.

When it comes to specifically describing and measuring freedom within the P-A model, there does not seem to be a standard method in the literature. This appears to be because in application of the P-A model, the focus seems to be describing conflicts between the principal and agent, primarily in terms of how incentive structures can encourage behaviour that goes against the interests of the principal: for example, various sales incentives negatively affecting the bottom line of shareholders. As such, less emphasis is placed on how different incentive structures influence the freedom which agents experience in acting.

In this case, although there seems to be a conflict between the freedom of researchers and the steering of research by NWO, this conflict seems to exist primarily from the perspective of the agent (researchers) — not the principal (NWO, who does not appear to value freedom of research on its own). This research will approach the study of researcher freedom by introducing a theoretical understanding of freedom within the P-A model — thereby studying freedom separately to the interests of either the principal or the agent (although these are certainly relevant and warrant discussion).

To start, a concept of freedom that is compatible with the theoretical and philosophical underpinnings of the P-A theory needs to be found. The theoretical economic context in which the P-A theory finds itself is the Neoclassical theory of economics which philosophically corresponds to a rather strict philosophical utilitarianism, where it is not so much taken in its normative ethical context but as a (hedonist, one might say) theory of (the rational, utility-maximising) driving factors of human behaviour.

When it comes to the measurement of freedom in this setting of Neoclassical economics, Amartya Sen's (1988) freedom of choice concept and the respectable body of theoretical literature it has inspired, such as various measures and extensions of the concept (Pattanaik & Xu, 2000; Dowding & van Hees, 2009), come to mind. Sen's (1988) freedom of choice concept presents the availability of choices, specifically as relating to budget constraints determining the choices one can make, as contributing to freedom. With this, Sen attempts to highlight an aspect of freedom that depends not just on outside interference, as in the interpretation of Berlin's negative liberty (at least, as adopted here: see page 12 of this research) but depends also on the possibilities one is presented — the availability of choices. Although Sen (1988; 2005) has indicated that freedom of choice may be considered outside of rational choice theory where individuals are necessarily seen to maximise self-interest (Sen, 2005), this research will focus on the self-interest, or utility-maximisation, aspect of freedom of choice for the P-A context of application considered here.

Lastly, by being able to capture an aspect that does not depend completely on a notion or the understanding of 'outside interference', as in negative liberty, freedom of choice may provide another conceptual perspective to the individual liberties of researchers which Eisenberg sees (see page 12) as largely unaffected by, and sometimes further justifying, research interference (in this case research steering). In this way, by studying research steering through freedom of choice, we may be able to more precisely describe how research steering affects academics' freedom (of choice).

Preference and freedom

In considering researchers' choices through the lens of Sen's (1988) freedom of choice concept, it is necessary to briefly examine the role of freedom in economics, specifically Neoclassical economic theory (NCE), and to determine how this research sees the freedom of researchers when they are seen as economic agents.

Although much of the current literature on an economic role of researchers seems to centre around the perspective of researchers as 'producers of knowledge' (Houghton, 2019; Gläser & Laudel, 2016), whether researchers, as Neoclassical economic agents, should be considered as economic producers is not as clear-cut. Rather, some important aspects of behaviour of researchers seems to better align with the understanding consumers in neoclassical economic theory. Crucially, the difference between consumers and producers in NCE concerns the role played by freedom.

As described by De Uriarte (1990), profit maximising producers (firms) can choose between alternatives only when they do not have exact knowledge over which alternative will maximise profits. When information of the market is perfectly and completely known (as in the NCE (De Uriarte, 1990)), producers, who maximise profits, merely employ the profit-maximising production technique, and thereby have no freedom in their production choices (De Uriarte, 1990; Baumol, 1968). Conversely, the freedom of consumers is seen to surround the existence of their preferences — equivalently the utility of options (i.e., consumption bundles). There exist different views of this freedom, particularly with how people are free with regards to their preferences, but one expressly prevalent view in NCE is the exogenous view of preferences. When preferences are seen to be exogenously given (i.e., determined outside economic theory), freedom of consumers, to economists, appears as degrees of freedom in setting the utility of choices (i.e., one degree of freedom per choice per consumer). To consumers, this freedom can be seen as the ability to set and alter preferences. Importantly in the exogenous view, setting and altering preferences occurs outside of the market (De Uriarte, 1990).

Following observations made that researchers can, to some degree, follow their own preferences in research (and research funding) (Leišytė, Enders, and de Boer, 2008), and that researchers' success, is not

determined on a *single* concrete *quantity* such as firms' profit,⁴⁰ this research proposes that researchers' freedom of choice can be considered similar to the way consumer preferences and freedom are seen in NCE. Analogously to consumers, researchers — considered as maximisers of a preference-based utility — choose between funding options based on a perceived utility, and in the case of thematic funding also could be seen to choose between different research directions. In this context, researchers' freedom of choice emerges from the freedom associated to researchers' preferences. We consider utility-maximising researchers to be free to choose when they are free to set and alter their preferences in research.

Additionally, in relatively recent efforts, economists have been exploring the possibilities and formulating theories of endogenous preferences — aiming to describe preferences as following from economic theory rather than preceding it. With endogenous preferences, economists aim to describe ways in which preferences, at least in part, can be formed by economic circumstance and past events (Arnsperger & Varoufakis, 2006; Lazear, 2000; De Uriarte, 1990). Therefore, from the perspective of endogenous preferences, it would seem that the freedom in setting and altering ones' (consumer) preferences, independent to economic theory when exogenously given, no longer escapes the grasp of economic theory when preferences are endogenous (De Uriarte, 1990). In other words, endogenous preferences imply that, due to the influence of the (economic) environment on preferences, agents' freedom in setting and altering preferences could be said to exist under economic conditions, or influence.

Analogously, the researcher, who has been analytically identified with the Neoclassical consumer here, could be said to be free to choose his direction of research to the degree that his preferences in research are not influenced by the economic 'state of affairs'. With regards to research agendas, insights from the literature on endogenous preferences would point us to search for ways in which researchers' preferences might depend on financial factors influenced by the research agenda.

This research proposes that research agendas influence researchers' preferences by prioritising and defining direction of research through various research programmes and thematic funding lines, and that this influence is enhanced by the existence of research budgets (for example, as empirically studied by Leišytė, Enders, and de Boer (2008) and described by Pereira-Puga & Sanz-Menéndez (2024) and Gläser & Laudel (2016)). The guiding idea is that researchers would, in part, prefer to spend their efforts researching promising and well-funded fields. By influencing thematic research funding, research agendas potentially influence researchers' preferences — at least their preferences insofar actions *reveal* them. This *revealed* view of preferences, where choices are considered to be a result of agents' preferences, will be adopted here.⁴¹

Here, freedom of choice in research — with respect to research funding — could be said to exist to the degree that research preference is uninfluenced by research funding. Conversely, constraint of freedom of choice is seen to arise when research preference is influenced by research funding or financial incentives. By first seeing researchers as maximisers of utility and positing that utility (which expresses utility), in part, depends on research funding, this research is able to study the preferences of utility-maximising researchers based on research funding. By investigating these preferences in funding lines, this research could determine to which degree they entail *preferences in research* (for example topic, method, question, etc).

⁴⁰ However, increasingly, various metrics, such as author-impact metrics, are being used in the assessment of academics' careers (Abbot et al., 2010).

⁴¹ An important remark is here is that actions may not necessarily reflect preferences — agents may act in a way that does not align with their 'true' preferences. See for example Sen (1973).

Theoretical premises

Having identified Sen's freedom of choice as a suitable concept of freedom in studying the utility-maximising researcher under the influence of financial incentives, we could further inquire how different research agendas compare to each other with respect to the freedom of choice they offer researchers. To do this, a suitable measure of freedom of choice should be found. To identify a suitable measure of freedom, it may serve to recapitulate and make explicit three of the premises or assumptions that this study has made thus far.

The first premise is that the direction of research is affected by research agendas and that this is, at least partially, dependent on choices of academics. This premise —that NWO affects the direction of research — is justified by observing NWO's own communication regarding their role and how it "steers the course of Dutch science by means of research programmes"⁴². For example, with respect to their un-themed, open funding line, NWO has indicated that it wishes to prioritise this type of research by increasing the number of funds available (NWO, 2022, p. 36), thereby implying that the actions and choices of researchers depend concretely on the conditions and availability of funding lines. Similarly, Gläser and Laudel (2016) also study the effect of government policy on research content.

The second premise is that the behaviour of researchers can be approximated by utility-maximizing behaviour. To be precise, this requirement only states that large-scale behaviour of researchers, to some extent, can be approximated by utility-maximisation. The third premise is that the average expected utility perceived by researchers will approach a value that is calculable from concrete inputs — specifically applied to financial inputs here. The second and third premises together can be taken to mean that the behaviour of researchers could be derived from financial inputs.

These two premises can be partially justified by the remark that researchers require a budget to conduct research (although the degree to which this holds could depend on the field and type of research). Moreover, Eisenberg (1988) and Gläser & Laudel (2016) also present the existence of research budgets as a central factor in allowing external funding to distort academic values.⁴³ After all, the procurement of research funds being a prerequisite for research may encourage researchers to search for funds, and thereby engage in utility-maximisation.

The view that researchers act as utility-maximisers also seems to resonate with findings of research. To start, is the view related to Romer's work that policymakers ought to provide researchers with profit incentives in researching new ideas (Romer, 1989; Jones, 2019; Romer & Nelson, 2004), which provides a reason for policymakers to encourage maximising behaviour in the first place. Second are the findings that the principal agent theory, which sees rational agents through as utility-maximisers, is applicable in academia under NPM (Olssen & Peters, 2005; Leišytė, 2005 & 2006) which further confirm the applicability of utility-maximisation in describing behaviour. Similarly, there are findings by social scientists studying the neoliberal university who find that, under neoliberalism, academics are encouraged to see themselves as entrepreneurs who maximise a utility or 'profit' (Houghton, 2019; McNay, 2009; Lorenzini, 2020). In particular, the economic perspective noted as being dominant in defining utility (Houghton, 2019). These

⁴² This quote is taken from NWO's mission statement: "The Dutch Research Council (NWO) funds top researchers, steers the course of Dutch science by means of research programmes and by managing the national knowledge infrastructure."

⁴³ An important remark here is that the way research budgets are considered here differs slightly to the consumer budgets of Sen's (1988) freedom of choice. Where Sen introduces budgets as relating to the choices consumers can make — i.e., that a larger budget allows for more choices —, research budgets here do not increase the number of grants available. They might, however, increase the freedom *in doing* research, which may be a significant motivator for researchers to pursue grants in the first place.

findings providing a foundation for considering researchers’ behaviour as utility-maximising and where utility depends on financial inputs.

However, regarding the interpretation of these three premises some remarks should be made beforehand. Seeing researchers as utility maximisers does not require that each decision is described by utility-maximising behaviour (see also (Sen, 1990)). Rather, because this research is mostly interested in NWO’s influence on Dutch research on the whole, this research focuses on the ‘large-scale’ behaviour of researchers. On this, the utility assigned by individual researchers can depend on, for example, personal inclination and preference, and is therefore able to significantly deviate from the average. Moreover, that maximising behaviour can be derived from financial inputs should not be taken to mean that researchers necessarily make decisions based on financial considerations — although this may be the case to a certain degree. Rather, the claim is strictly that the factors which influence the decisions and behaviour of researchers correlate with financial inputs. For an example of this, consider a researcher who chooses research direction and funding line based on the expected probability of obtaining the research grant and successful resulting publication. Although the researcher may be most motivated by the ability to publish, since this ability may depend on the probability of obtaining the grant, even their behaviour, although not financially motivated, could depend on financial inputs under NWO’s control.

Table 1: Summary of theoretical premises and justifications

Premise	Supporting observation and justification
1: Research choices are influenced by research agenda.	NWO’s 2023-2026 strategy report; Eisenberg, 1988; Gläser & Laudel, 2016
2: Large scale, ‘average’ behaviour of researchers can be approximated by utility-maximising behaviour.	Olssen & Peters, 2005; Houghton, 2019; Leišytė, 2005 & 2006
3: Utility that drives behaviour can be derived from financial inputs	NWO’s strategy report; Eisenberg, 1988; Houghton, 2019; Jongbloed, 2007; Gläser & Laudel, 2016; Pereira-Puga & Sanz-Menéndez 2024

Measuring freedom of choice

To recapitulate, this research identified choices as a dimension along which NWO’s research agendas could influence the direction and freedom of researchers. To study researchers’ freedom under research agendas, Amartya Sen’s freedom of choice was identified as providing a suitable conceptual framework of freedom where choices in research direction are considered through the lens of the thematic research funding lines specified by NWO’s research agenda. Subsequently, based on observation and existing literature, theoretical premises were formulated from which could be concluded that the behaviour of researchers will be considered as utility-maximising where utility, expressing a preference, will be seen to depend on financial inputs. It remains to identify a measure of freedom of choice which is compatible with these theoretical characteristics in mind.

Thus far, we consider researchers choosing between funding lines and thereby to choose between research directions in the case of thematic funding. Moreover, we consider utility values corresponding to those choices. With Sen’s freedom of choice there are various theoretical extensions and specifications of the concept to, for example, formulate measures of freedom of choice.

Not all measures of freedom of choice, however, are compatible with the identified criteria. One of the most well-known is the so-called *cardinality measure* as discussed by Pattanaik and Xu (2000). This measure, simply put, counts the number of choices available. However, by not being able to discriminate between choices, the cardinality measure is unable to measure freedom of choice when we wish to study it in relation to utility-valued choices.

The entropy measure of freedom of choice (Suppes, 1996; Miyagi & Morisugi; 1996) on the other hand, which has been shown to be applicable in the context of Sen's freedom of choice concept (Dowding & van Hees, 2009), takes into account weighted choices, such as utility-valued choices in the measurement of freedom of choice. Moreover, the entropy measure of freedom of choice has found quantitative application in the context of utility valued choices in general (Dennis & Gabor, 1979; Erlander, 2005) and recently in measuring consumer freedom (Chen et al., 2020; Rommeswinkel, 2021), which bears some resemblance to this research's application of utility-maximising researchers. For these reasons, the measure of freedom of choice that will be used in this research is Suppes' (1996) entropy measure applied to the utility of choices seen as choice weights (hereafter: measure of freedom of choice).

To briefly recapitulate again, the measure of freedom of choice of researchers under research steering that this thesis presents consists of the following. Firstly, it considers the effects of research steering through the lens of the choices of researchers. Thereby, research is seen to be influenced by research agendas through the relationship between research funding and research choices. Secondly, we consider researchers as utility-maximisers. Thirdly, the average, or expected, utility is seen to be derivable from concrete, measurable inputs. Here we consider financial inputs. Lastly, freedom of choice of researchers is measured using the entropy measure of freedom presented by Suppes (1996). Thereby the measure takes the utility values as inputs and outputs a value corresponding to the degree of freedom of choice present.

Roughly speaking, the freedom of choice measure of utility-valued choices measures the degree of 'unevenness' among the utility of choices. For an even distribution of utility among choices the freedom of choice measure will be a large quantity (maximal, in fact) and unevenly distributed utilities among choices will yield a low measure. From the perspective of utility-maximisers, evenness in utilities indicates that utility-maximisers are presented with many (nearly) equivalent choices and that many (nearly) optimal, utility-maximising research choices are available. When few choices are clearly better than others (in terms of average utility), the freedom of choice measure will yield a low value. This indicates that a utility-maximiser, whose personal utility correlates, or depends, to some extent on this expected utility has few good choices, and many bad ones, and by being motivated by utility-maximisation, therefore has little freedom of choice. In this way, the freedom of choice measure could be seen to correspond to an intuitive understanding of freedom, where we are free to choose if we are faced with many good choices and unfree when faced with few (good) choices.

Importantly, this research will measure freedom of choice corresponding to normalised utility values (that is the utility values proportional to total utility). This choice is justified in two ways. First, by seeing that only the relative difference between utilities influences the choices of utility-maximisers, it can be noted that normalising the utilities has no impact on the choices made. Second, one can observe that the behaviour of utility-maximisers is scale-independent with respect to utility — i.e., that multiplication of the utility of all choices by any positive factor will yield the same behaviour: thereby, only the normalised utility values are needed to measure freedom of choice. Similar approaches were taken by Dennis & Gabor (1979) in a closely related application, by Suppes (1996), and by Miyagi & Morisugi (1996).

With this, the measure of freedom of choice can be expressed precisely in mathematical terms. Given a set of available grants $\mathbf{A}=\{\mathbf{a}_i\}_i$, which we take to represent choices and where a specific grant call is denoted using \mathbf{a}_i , let $u_j(\mathbf{a}_i)$ be the normalised utility of grant \mathbf{a}_i according to researcher j . Then the measure of freedom of choice with respect to research agenda (\mathbf{A}) according to researcher j is equal to:

$$H_j(\mathbf{A}):= -\sum_i u_j(\mathbf{a}_i) \cdot \ln(u_j(\mathbf{a}_i)).$$

Furthermore assuming that large-scale behaviour approximates behaviour driven by the average utility (derived from financial inputs), say \mathbf{u} , we can say that the large-scale freedom of choice measure of research agenda (\mathbf{A}) is equal to:

$$H(A) := -\sum_i u(a_i) \cdot \ln(u(a_i)).$$

Moreover, we can also consider the probability of obtaining grant a_i which could be empirically estimated using the formula $p(a_i) = \text{approved_applications}(a_i) / (\text{total_applications}(a_i))$. This yields another variant of the entropy-freedom measure corresponding to behaviour driven by the probability of approval (where utility is simply equal to this probability):

$$H(A) := -\sum_i p(a_i) \cdot \ln(p(a_i)).$$

Moreover, the expected, or average, financial utility is then equal to $\langle u(a_i) \rangle = u(a_i) \cdot p(a_i)$, from which the similarities with the average utility freedom of choice measure become visible.

To conclude, the Suppes' measure of freedom of choice can be applied to measure the freedom perceived by utility-maximising researchers faced with utility-valued choices. Different variations are possible depending on factors considered to influence utility and drive behaviour. Here, this research provides two variations, two (one for individuals and one for the average) where researchers are guided by a financial utility (which is left to be determined), and one where researchers are driven by the probability to obtain a certain grant.

Lastly, some remarks regarding the applicability of this measure should be made. The first is that the correlation between research choices, specifically relating to the direction of research, depend on the research agenda and the specific funding lines and thematic conditions. If thematic conditions are less strict, then correlation between funding lines and research choices made will be lower. Since this factor depends on the context of application (the specific research agenda), this must be taken into account on a case-by-case basis to avoid misinterpretation or overinterpretation of the measure of freedom. Next is the remark that other many other ways to similarly measure freedom of choice exist (Cote, 2021), and these should be considered in future studies. However, a common feature among the measure presented here and the alternatives is that maximum freedom is achieved when utility is evenly distributed. This means that although there may be quantitative differences between different measures of freedom, qualitative findings based on the maximisation of freedom, such as the policy recommendations derived in the next Chapter and trends in data, will hold regardless of the precise measure chosen.

For the sake of clarity, the measure of freedom of utility valued choices presented here will be referred to as '(measure of) utility freedom', '(measure of) utility freedom of choice', or simply '(measure of) freedom of choice'. If freedom of choice is used in one of its other, non-utility-maximising meanings, this will be made explicit. Put in concrete terms: the utility freedom of choice is the entropy measure of freedom of choice corresponding to utility-valued choices.

Answering research question one

RQ1: To what extent are Amartya Sen's (1998) freedom of choice concept and Suppes' (1996) measure of freedom applicable to the conditional grant system of funding research of the Dutch research funding organisation NWO?

Answer to RQ1: Sen's freedom of choice and Suppes' entropy measure of freedom are applicable to modelling the NWO's conditional grant system of research funding to the extent that researchers' behaviour can be explained by utility-maximisation of NWO incentives and to the extent that different funding conditions of the NWO correlate the choice between funding lines and research direction.

Based on observation and other research conducted (Olssen & Peters, 2005; Gläser & Laudel, 2016), the extent to which researchers in the context of NWO research funding can be

studied as maximisers of utility appears to hold to a significant degree that warrants further study and applicability of the theoretical approach presented here.

Regarding the correlation of NWO funding conditions and research direction, there is no straight-forward answer. Although some studies have studied the effects between research funding and research choices (Leišytė, Enders, and de Boer, 2008, Gläser & Laudel, 2016; Gläser, 2019), the degree to which this effect exists is not yet fully understood. However, in combination with NWO's own efforts in steering research, and building on previous research (Gläser & Laudel, 2016) there is good reason to conclude that this holds to a degree that warrants further study.

Chapter 5: Results

Introduction to funding diversity

Successful application of the measure of freedom of research agendas developed in the previous section in practice rests on the estimation of utility from observable or measurable quantities. However, in estimating the utility of funding lines, certain assumptions about researchers must be made to calculate or estimate utility values. For instance, we could assume that researchers are driven purely by financial motivations, such as expected financial revenue corresponding to funding lines. To estimate a utility function based on this assumption, we would need data on the financial revenue corresponding to each grant and empirical data on the number of approved and disapproved grant applications to estimate the probability of obtaining the grant and financial revenue. If instead we would assume that researchers are not driven by financial revenue, but the ability to publish, we might look at the probabilities of obtaining grants as utilities and we would only require the data on the approval ratio which could be related to the total budget. In either of these cases, however, NWO's currently available data would not be sufficient since their project database only includes data on successfully funded projects, which means data on the total number of applications is not made available outside of a few cases (NWO, 2022c).

Another possibility would be to instead measure the relative distribution of grants among funding lines, which would be an indication of diversity rather than freedom. Diversity and freedom appear to be closely related under certain conditions (Suppes, 1996; Dowding & van Hees, 2009). With utility-maximising agents, for example, a choice with greater expected utility⁴⁴ will be chosen more often, leading to lower diversity among the chosen outcomes. In fact, when introducing the entropy measure, Suppes analyses diversity in voting outcomes which he claims to be equivalent to freedom under *ceteris paribus* assumptions (keeping all other factors constant). In the case of choices in research direction, these assumptions would need to include the assumption that researchers overall have no inherent preferences on the whole. Since the following analysis concerns funding data over time, this assumption need hold true to observe at trends — although it is an important consideration in interpreting the results in terms of researcher freedom. However, it is also not certain which other assumptions may need to be satisfied to equate diversity with freedom.

The view this research will adopt is that diversity is not equal to freedom but will (cautiously) acknowledge that an increase in diversity can indicate an increase in freedom of choice and vice versa. Therefore, measuring trends of diversity among funding lines rather than freedom, which depends on data that is made fully available by NWO could yield valuable insights into the freedom of choice provided by research agendas.

Diversity analysis on NWO project database

NWO has been keeping track of research projects it has funded since 1997 and stores them in an open project database. This database, which can be accessed through its Application Programming Interface (API), keeps track of a number of project characteristics including, but not limited to: start-date, end-date, project applicants, and project funding schemes. To measure the diversity of a research agenda or the diversity of funding lines, it is then necessary to group all projects by a chosen characteristic, say by year,

⁴⁴ Here it is important to note that although a choice may have a higher expected utility, this may not necessarily hold for the utility of all agents. The effect that individual utilities can differ from the expected utility could be modelled with a (normally distributed) random variable, as modelled in the logit model (Erlander, 2005), but since this research is focused on the large-scale behaviour and measurement this effect will not be modelled.

and for each year to measure the diversity among funded projects. An outline of the procedure for analysing the diversity of NWO project funding by year is as follows:

1. Collect all NWO project data by API;
2. Group all projects by year (or other desired timescale/categorization);
3. Aggregate all projects by project funding scheme attribute;
4. Measure diversity using entropy measure on the proportional funding scheme aggregate.

Since the total number of NWO projects is quite large (14621), in step 1 the project data was retrieved using a python script. For step 2, the projects were grouped by the starting date. This date was chosen since many recent projects were not yet updated with an end-date. However, NWO's database did not list the start-date for 814 projects distributed among various years and funding schemes which were omitted from the analysis. Regarding step 4, the following expression is used to calculate the entropy measure of the distribution among funding lines in a specific year:

$$\text{ENTROPY}(\text{YEAR\#}) := - \sum_{\text{SCHEME} \in \text{SCHEMES}} \frac{\#PROJECTS(\text{SCHEME})}{\text{YEAR\#TOTAL}} \ln\left(\frac{\#PROJECTS(\text{SCHEME})}{\text{YEAR\#TOTAL}}\right).$$

Figures — Diversity Funding schemes

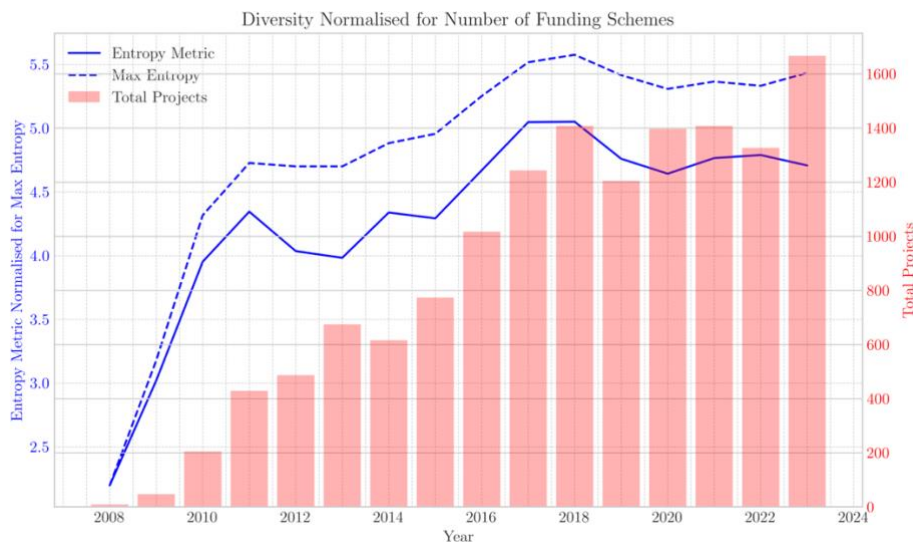


Figure 1: Total projects, diversity, and maximum diversity as measured by the entropy metric over the distribution of NWO projects among funding schemes per year (2008-2023).

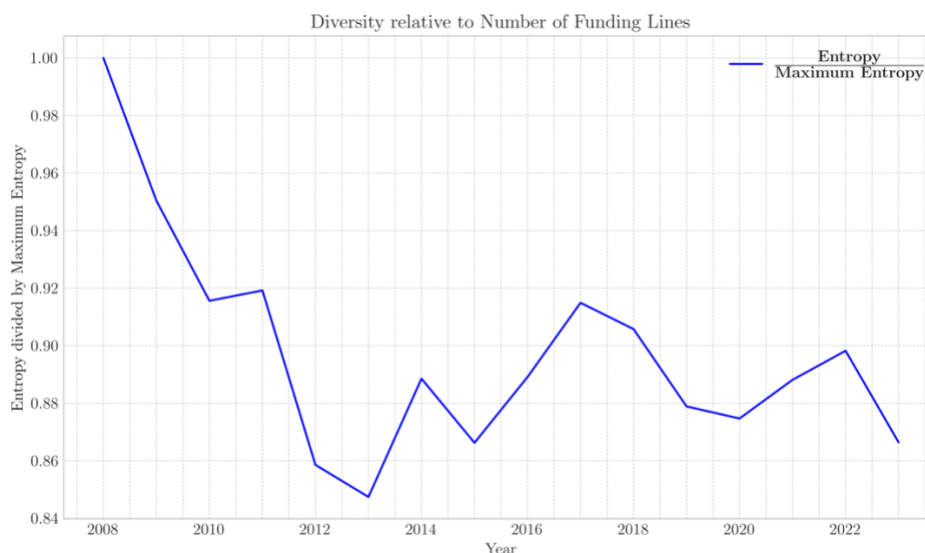


Figure 2: Ratio of diversity to number of funding schemes

Years	Total projects	Average per year	%increase	% increase per year	Diversity increase
1997-2005	16	2	200%	25%	0.79
2006-2010	290	58	2800%	560%	3.16
2011-2017	5242	749	190%	27%	0.71
2018-2023	8412	1402	18%	3%	-0.34

Table 2: Summary of the data.

Data Summary Findings from Diversity Analysis

Based on the funding scheme data from NWO's project database, the diversity among funding schemes has increased significantly since NWO started collecting data in 1997. Roughly speaking, we see four periods with different trends: 1997-2005, 2006-2010, 2011-2017, and 2018-2023.

The years 1997-2005 have a low number of total number of projects (16 in total), which could be due to less involvement by NWO in the funding of projects and lack of available data. In these years we see an increase in the number of projects and an increase in the diversity, but because the number of funded projects is low, the trends in diversity appear erratic (see appendix figure 3). For these reasons, little further attention is paid to 1997-2005.

In the years 2006-2010, there were significantly more projects (290 in total and 252 in 2009 and 2010), and diversity increased significantly by 400%. This growth seems to be largely driven by an increase in the number of funding schemes in total (see table 2 in the appendix).

The years 2010-2017 saw a large increase of 1039 in the total number of projects in NWO (a growth of 507%), but the diversity increased at a slower rate with a mere 28% increase in 7 years. Since the diversity largely follows the same trend as the maximum diversity given the number of funding schemes, it can be concluded that the apparent slowdown in diversity growth is largely attributable to mathematical properties of the entropy measurement as related to the number of total funding lines.⁴⁵ However, closer inspection of the diversity relative to the maximum diversity (see figure 2) shows a significant decrease in the years 2008 to 2012 — from which the conclusion can be drawn that, although there was a larger number in funding options, the distribution of projects among funding lines was less evenly distributed.

⁴⁵ Specifically, that the derivative of the entropy function for even distributions goes as $1/n$ where n is the number of categories or choices.

The years 2017-2023 saw a small decline in diversity and relative diversity. Additionally, the number of funding schemes also showed a small decline and the number of projects remained roughly constant around 1370, only increasing to 1667 in 2023. In this period, NWO seems to have concentrated many of their funding lines into fewer, larger ones that support a higher number of projects (See figure 4 of the appendix). Closer inspection shows that, in these years, and particularly in 2018-2023, the number of projects supported by their un-themed open competition funding line has increased substantially (from 27 to 561 or from 1.8% to 33.1% of the total number, figure 4 of the appendix).

Therefore, when it comes to the freedom of choice of utility-maximising researchers under NWO, NWO's research agendas insofar they influence the funding lines and the number of projects among them have affected this freedom in several ways. Firstly, for the years 1997-2005, since NWO has nearly no data on these years (which could be due to lack of involvement altogether), much cannot be said about the freedom of researchers. There is an apparent increase in the diversity in these years, but it appears to be largely attributable to the increase in the number of projects funded. Any additional conclusions would be hard to justify due to the low number of data points.

In the years 2005-2010, we see a large increase in diversity among funding options that closely matches the increase corresponding to the maximum diversity given the number of funding options. From this it could be concluded that NWO has increased diversity among funding lines by increasing the number of funding schemes.

In the years 2010-2017, we see a lesser increase in diversity, which could be indicative of an increase in freedom of choice (in terms of funding options). This increase can be mathematically attributed to the increasing number of funding schemes, which shows that NWO could be said to have increased the freedom of choice by increasing the amount of different funding options available, however, as is the case with 2005-2010 too, additional research on the precise research funding conditions during these years would have to be conducted since there is not a straight-forward correspondence between funding lines and research direction. These conditions are presumably difficult to retrieve since, NWO's database includes no information on the funding schemes themselves and their website only shows recent funding calls (after 2021). Moreover, NWO's reports (financial and other) do not include information about specific funding conditions.

However, looking at the diversity relative to number of funding schemes in the years 2008-2011 (see figure 2) shows that although diversity increased due to an increase in the number of funding schemes, the distribution among these funding schemes was uneven, and that the increase in diversity came paired with a decrease in relative diversity, indicating a potential increase in steering intensity via financial incentives. Lastly, in the years 2017, diversity in funding slightly decreased, owing to a decrease in the number of funding lines. Looking at the precise distribution 2017-2023 however, shows that this decrease is paired with a substantial increase in the number of projects funded by NWO's un-themed, open funding line (1.7% to 33.1% of total) (see figure 3 of the appendix). Therefore, although the freedom of choice among funding lines can be said to have decreased, the same could not simply be concluded for the freedom of choice of research direction.

Discussion and conclusion on Diversity Analysis

The purpose of this diversity analysis was twofold. First, conducting an analysis on NWO's practices in funding projects could give an indication of practical viability of the measure of freedom of choice of researchers presented here. Second, this analysis could shed light on NWO's practices regarding the freedom of research under research steering.

With regards to the viability of the measure of freedom of choice of utility-maximising researchers, the analysis conducted here highlighted some possible points of failure, or where improvements could be made. First, the measure views funding choices as an abstract representation of research choices in

general. Therefore, the applicability of this measure rests on justifying this abstraction which in practice proves to be difficult due to additional contextual considerations. For instance, funding lines could have varying degrees to which their thematic conditions impose on the formulation of research questions. For this reason and other contextual considerations like this, drawing conclusions directly from this measure proves to be inappropriate in practice. However, it does seem that underlying trends manifest in the measure taken over funding lines. Therefore, although the measure of freedom corresponding to funding lines cannot be taken as directly indicative of the freedom of research, this tool can provide analytical value in guiding and supplementing further, more directed analysis.

With regards to NWO's own practices, the results seem to confirm that the measure of diversity can capture trends in NWO's policy. For example, NWO's substantial increase of the open competition budgets, which NWO has indicated it would pursue (NWO, 2022c, p. 13), of which the effect can be seen in the decrease of diversity and maximum entropy in 2017-2023. Although showing a decrease in diversity, rather than the increase implied by NWO (NWO, 2022c), here the diversity measure shows that it can capture trends in NWO policy. Similar to this, the diversity analysis allows one to see the larger trends, but since the trends in 1997-2017 are part of NWO becoming a major funder of research in general, it is hard to draw conclusions specifically about the freedom of research in these years. For example, although it can be said that NWO increased the freedom of research represented in funding lines in 1997-2017, it can also be said that this is a natural consequence of NWO representing an increasing amount of research, and therefore is not directly indicative of NWO's own policies regarding freedom of research. Furthermore, seeing that NWO's funded publications as a share of total publications at all Dutch universities has increased substantially in these years (from 0.002% in 1997 to 1.65% in 2017, see figure 5 in the appendix), it could be the case that freedom of choice at NWO has increased despite Dutch research as a whole being less free due to greater influence from NWO.

The measure presented here, with some extensions and improvements (see Limitations and Future Research) as well as additional clarification on the difference between diversity and freedom, could be used as a supplement to NWO's own documents in studying the freedom of research under the Dutch national research agenda.

Answer to research question three

RQ3: Based on NWO funding data, to what extent does NWO support freedom of choice as per Suppes' measure of freedom in their conditional grant system of funding research and if so, how?

Answer to RQ3: Based on NWO funding data, if we consider that diversity correlates with freedom of choice as was claimed by Suppes (1996), we can see that NWO has affected the freedom of choice of funding. In the years 1997-2010, freedom of choice has increased primarily because the total number of projects and funding lines increased. However, relative to the number of funding lines, we can see that freedom of choice decreased in the years 2008-2013 (figure 2). This means that although there was more choice between distinct funding lines, funding was less evenly distributed. In the years 2018-2023, owing to a decrease in the total number of funding lines, we can see that freedom of choice in funding schemes decreased. In this period, NWO seems to have prioritised decreasing or maintaining the number of funding lines, focusing to fund more projects per funding line. Notably, during this period, the amount and percentage of projects funded through open competition increased to a large degree, which implies that freedom of choice in research direction may have increased compared to research choice among funding lines. This also implies lower or less direct applicability of the measure of freedom of choice used here.

To summarize, NWO can be said to have supported the freedom of choice in two ways. First, they increased the number of funding lines in 1997-2017. In 2017-2023, NWO can be said to have

relaxed funding conditions on research as a whole by allocating significantly more funds to open research. Lastly, specifically with regards to the evenness among funding lines, NWO can be said to have decreased freedom of choice relative to the number of funding lines, thereby indicating that NWO may have increased the intensity of financial steering despite increasing the overall freedom of choice in funding.

Theoretically derived policy strategies

Another promising application of the measure of freedom is for theoretical derivation of policymaking implications aimed at improving the design of research agendas in respect to the freedom of research.

NWO sees itself as actively taking part in steering the course of Dutch research and within this steering NWO seeks to find a balance between research that is unbounded by thematic conditions and thematic research, which they refer to as “demand-driven research” (NWO, 2022, p. 36). In the case of demand-driven research, NWO sees that the research “topics and questions are not determined by researchers, but by others [society]” (*Ibid.*, p. 36). Furthermore, the relation NWO sees between unbounded and thematic research, is that ‘unbounded research feeds demand-driven research’ (*Ibid.*, p. 36), and, for this reason, aims to find a balance (*Ibid.*, p. 22).⁴⁶

The position taken here will be to explore four theoretically motivated approaches to designing research agendas that increase the freedom of research and to give an overview of the benefits and drawbacks to each approach. Although the approaches here will be presented as ways to increase or maximise the utility freedom of research, the same approaches could be applied inversely to decrease the freedom of research.

Relaxing funding conditions

With a measure that sees utility valued choices, attention can be focused on the utility of choices, or on the choices. The first approach to increasing the freedom of researchers as seen by the measure of freedom of choice is obtained by observing the choices researchers can make.

In this approach, the freedom of researchers can be increased by relaxing the conditions associated with funding — in effect, allowing for more research choices corresponding to each funding choice. This approach increases the freedom of research by decreasing the correlation between the choices of researchers in direction and the availability of funding lines, in effect decreasing the applicability of the measure and decreasing the expected influence of the mechanism of research steering studied here.

Although it appears that NWO takes this approach into account and is thus generally a desirable approach to increase the freedom of research (NWO, 2022, pp. 22 & 36), pursuing this approach completely may be undesirable for two reasons. Firstly, from the perspective of academics, completely relaxing thematic conditions might still allow for other (perhaps less visible) forms of research steering. This is because grant approvals could still remain under the control of a central NWO committee, which could have its own biases regarding what topics are deemed academically relevant; thereby potentially influencing the approval or rejection of proposals. Maintaining transparency and objectivity over the direction of research may be better served when thematic conditions are explicitly defined, which may inevitably come with a cost to the freedom of research. Secondly, from the perspective of NWO steering research, it provides research freedom at a direct cost of control. By relaxing funding conditions past a

⁴⁶ It seems that with regards to the relation between unbounded research and steered research, NWO has adopted a similar stance as put forward by Nelson and Romer (2002) with fundamental research (open, curiosity-driven research in the case of NWO) feeding applied research (societally oriented, thematic research in the case of NWO).

certain extent, NWO may fund research which may not contribute to NWO's goals of economic and academic competitiveness. This seems to be a risk that they are aware of (NWO, 2022b, pp. 32 & 34).

Increasing the number of distinct funding options

A similar approach to relaxing funding conditions is the strategy of increasing distinct funding options. This strategy focuses on expanding the number of distinct research directions by expanding the number of distinct funding lines rather than enhancing the freedom of research within a specific funding line as seen in the approach of relaxing funding conditions.

Although, by maintaining control over funding conditions, this approach may minimise the risk of financing research that does not contribute to NWO's goals, this approach misses the element of supporting and benefiting from researcher initiative in the support of research freedom. This is because any additional freedom and additional funded research provided by increasing the number of distinct funding lines would be subject to conditions determined by NWO — not academics. Additionally, past a certain extent, this approach may present managerial difficulties, as each additional funding line represents additional decisions regarding factors such as budgets and responsibilities by NWO and researchers. For instance, determining adequate budgets for each funding line may be inefficient and sensitive to error (that too much or too little funding is available) when the number of funding lines is high. Considering NWO's decrease in the number of funding lines in the years 2017-2023 and the increase of open competition funding line, it seems that NWO may already be aware of the downsides to large numbers of distinct funding lines.

Equalising utility

The third approach to increasing the freedom of choice of utility-maximising researchers is to equalise the utility of funding choices. This could be seen to improve freedom of choice by removing utility-based considerations to choose one funding line over another. Regarding the measure of freedom of choice, the situation where each choice has equal utility gives the maximum entropy given a number of choices (Suppes, 1996).

Since the financial utility of choices depends on, among other factors, grant availability and expected grant revenue, NWO can pursue this approach by estimating the dependence of utility on these factors and fixing the amount of funds available to each grant and funding line correspondingly. Moreover, this approach can be considered separately to, and in combination with, the approach of relaxing funding conditions.

There are several benefits to the approach of equalising utility. As indicated, equalising utility can be considered through budgetary and financial considerations and could thus be applied on an existing list of thematic funding lines. This means that the equalising utility approach allows NWO to retain some control over the steering of research in the determination of different thematic funding lines and the corresponding funding conditions, while simultaneously supporting freedom of choice by refraining from the usage of financial incentives.

Another benefit of granting research freedom through this approach is that NWO can be confident that preferences in research direction result from academic initiative, not their own budgetary policy. For instance, if NWO designs funding lines and budgets so there is no discernible (financial) utility difference between them, any subsequent increase in demand for a particular funding line would reflect academic interest, indicating potential for valuable research in that direction. By distancing itself from directly influencing research direction, NWO can use academic preferences as a 'purer' input — one that is not

shaped by the NWO's own research agenda. This approach would allow NWO to utilize apparent academic preferences among funding lines as valuable data for designing future research agendas, potentially enhancing their effectiveness by building on high-quality, objective information.

The downside to this approach is that utility can depend on many contextual factors, making implementation challenging. For example, different lines of research may require varying amounts of funding due to differing equipment needs. This specific strategy could skew research directions towards areas with lower budgetary requirements. Many such research-specific considerations are relevant in determining utility, meaning that in practice, the NWO must consider numerous variables specific to each research line when attempting to increase research freedom through utility equalization.

Mixed approach

Lastly, the two approaches of relaxing funding conditions and equalising utility can be combined in a mixed approach. There are, of course, many ways in which a mixed approach can be pursued, but here we will focus on one such way which seems to be closely related to NWO's balancing of open and thematic research funding (NWO, 2022, pp. 22 & 36).

The precise type of agenda considered here will be the research agenda where both thematic funding lines exist, as well as a funding line that has no thematic conditions. This type of research agenda seems to be preferred by NWO (NWO, 2022, pp. 22 & 36).

The benefit to this approach is that it gives NWO a clear, quantitative answer to the question "How should open and thematic research be balanced?": 'according to the freedom of choice measure presented here, the budgets of open and thematic funding lines should be such that researchers feel no financial incentive to choose between open funding lines or thematic funding lines'. By utilising specific data, such as estimates for funding requirements and demand for certain grants, NWO could further determine the size of budgets according to this approach.

Pursuing this approach could, even within a context of steered research, provide researchers with the freedom to make choices based on their own thinking rather than financial considerations. Additionally, by allocating adequate budgets for un-themed research, as indicated by NWO's 2022 goals (NWO, 2022c, p. 13), NWO can support research freedom driven by researchers' initiatives. This type of freedom is described by NWO as having higher potential for scientific breakthroughs and significant innovation (NWO, 2022).

Answer to research question two

RQ2: Based on Suppes' (1996) entropy measure of freedom, how could the freedom of choice of researchers provided by research agendas be measured and maximised?

Answer to RQ2: Freedom of choice of utility-maximising researchers according to Suppes' (1996) entropy measure can be maximised by: (1) increasing the number of distinct funding lines, (2) relaxing funding conditions, and (3) balancing the utility associated with each funding line.

Implementing these methods to maximise the freedom of choice of researchers rests on measuring it. First NWO must identify its distinct funding lines and their thematic conditions. Second NWO must estimate the utility a representative researcher perceives in pursuing each funding line. In practice, estimating the utility of funding lines perceived by researchers requires a lot of data on contextual factors, such as budget requirements relating to the type of research, and thus requires further research. However, a first approximation could be made by considering the expected financial revenue, which would be equal to the revenue of each grant times the

probability to obtain it. NWO already takes this probability into account (NWO, 2022c, p. 13), indicating that NWO may already be pursuing a similar strategy to some degree. On these expected financial revenue values, Suppes' measure can be applied and yield a measure for the freedom of choice corresponding to the research agenda.

Answer to research question four

RQ4: What policy recommendations for maximising freedom of choice of university researchers could be derived from the application of Suppes' (1996) measure of freedom to the Dutch conditional grant system of funding university research?

Answer to RQ4: Following the three ways Suppes' measure of freedom of choice can be maximised, three implied policymaking recommendation would be to: (1) design research agendas to support a large number of varied funding lines, (2) design funding lines where thematic conditions are as relaxed as possible, and (3) design funding line budgets and grant revenues such that there is no financial incentive to pursue one funding line over another.

With regards to achieving a balance in research steering and providing space for 'curiosity-driven' research, combining recommendations (2) and (3) yields another strategy. By this recommendation NWO could provide both open and thematic funding lines, but NWO should design budgets and grant revenues such that there is no financial incentive between different thematic funding lines and between thematic funding lines and un-themed, open funding.

Discussion on the measure of freedom of choice

The study of freedom of choice presented in Chapters four and five aimed to investigate the influence of research steering on research freedom using a theoretical approach. This was attempted this by integrating Amartya Sen's (1988) concept of freedom of choice Suppes' (1996) measure of freedom of choice, allowing for the measurement in freedom of choice among funding options. The measure of freedom of choice of utility-maximising researchers presented will be discussed in this Chapter. For a discussion of the results of application of the measure on NWO's own funding data see Chapter five.

This discussion here will be focussed on relating freedom of choice with its conceptual context. First, freedom of choice will be compared to the concepts of academic freedom as discussed and presented in Chapter two. Second, freedom of choice and the view of researchers as utility-maximisers will be related to commitment according to Amartya Sen (1997). Third, freedom of choice in the setting of utility-maximisation will be viewed through the perspective of Robert Sugden (2003) who highlights some conceptual difficulties when viewing freedom of individuals in terms of preferences. Lastly, this Chapter presents a general discussion, limitations and possible directions for future research.

Freedom of choice and academic freedom — How do they compare?

Comparing the concept of freedom of choice of utility-maximising researchers (here: freedom of choice) and the concept of academic freedom presents some difficulties. It appears to be difficult to come to a straight-forward conclusion whether freedom of choice is (in)compatible with academic freedom. In part, this is due to the generality of the freedom of choice concept. Nevertheless, some initial remarks can be made.

Freedom of choice in the context of utility-maximisation presented here falls within the Neoclassical theory of economics. As such there are some potential frictions; foremost, with the conceptions of academic freedom of Kant and Humboldt. Specifically, both Kant and Humboldt's conceptions of academic freedom seem to rest on, or in the case of Humboldt inspired by (Fuller, 2009; Filip & Moggach, 2019), a Kantian transcendental view of freedom. The transcendental view of freedom, however, could be seen to conflict with the (Neoclassical) utilitarian view of man as a utility-maximiser. For instance, if we consider utility to be a function of the external world and one's *existing*⁴⁷ preferences, then a Kantian transcendently free action — i.e., an action that cannot be attributed to any empirical internal or external cause (including existing utility or preference) — is not at all possible in the Neoclassical view of freedom of choice (Sen, 2005). This could cause considerable difficulties in reconciling freedom of choice and research steering based on this concept with academic freedom according to Kant and Humboldt.

Despite this, a large variety of situations and levels of freedom can be understood in the freedom of choice concept. For example, the situation where researchers choose among topics, but where the research question and method are predetermined is very different to the situation where all funding is open and has no conditions whatsoever. Yet, both these situations can be understood through freedom of choice. Moreover, even though agents are assumed to be utility-maximising, it is still possible to describe a situation where utility-maximisation behaviour is trivial or has no effect on agents' behaviour: namely, when utility of all choices is equal. In principle, research agendas could be designed to realise either of these situations, and thereby allow for a relatively high degree of freedom which may accommodate academic freedom.

⁴⁷ If utility was considered to be a product of one's own initiative or if one had active influence over preferences, then it may be reconcilable with transcendental freedom, but in considering utility in this way we may have incidentally smuggled in Kant's transcendental freedom in the determination of utility, and strayed far from Neoclassical theory. See also (Sen, 2005).

The degree to which academic freedom and freedom of choice of utility-maximisers could be compatible (insofar possible), therefore, appears to be, to a large extent, dependent on specifics of the research agenda. With this in mind, we could pose another question:

“Under what circumstances is the freedom of choice of utility-maximisers (most) compatible with academic freedom, and how could research agendas be designed with this in mind?”

To approach this question, we could look to see if certain aspects of academic freedom could be identified with aspects of freedom of choice. By making this identification, we might be able to gain insight about how freedom of choice should look if it were made compatible with academic freedom.

To start, we could look at the aspects which represent the highest level of freedom, both in academic freedom and in freedom of choice. In freedom of choice, the freest situation is the completely unconditional grant — the open-ended choice. In academic freedom, a corresponding aspect of maximum or *absolute* freedom could be searched for in the conceptions of Kant, Humboldt, and Mill.

In *The Limits of State Action*, Humboldt sees that the freedom of the university from state interference should be absolute in the sense that there exists no rightful state interference in academia, outside of matters of security. Mill seems to hold academic freedom in a similar regard, seeing that a certain unquestioned freedom is necessary in the pursuit of truth. Even Kant, although only in relation to the faculty of philosophy, sees the need for an absolute freedom that exists unconditionally. From these three authors, we could conclude that it is important that academia have a space of absolute, unquestioned freedom, although they may disagree over whether this extends to all or just some academic matters. In terms of research agendas, this could be taken to imply that, from the perspective of academic freedom, unconditional, un-themed grants should exist, although there could be disagreement over how much of NWO’s budget they should warrant.

An important observation here is that, in the theoretical approach presented here, the two questions “How large should the budget for unconditional research be?” and “How much absolute freedom does academic freedom grant research?” seem to be closely related, which has the notable implication that NWO research policy may be derivable from the study of concepts of freedom and concepts of academic freedom. From the perspectives of academic freedom studied here, the conceptions of J. S. Mill and Kant stand out as being potential sources of insight to answer these questions and derive policymaking implications. Kant specifically, due to his insightful reasoning on the role of the faculties and the government which Kant describes, provides an account of academic freedom that, in some sense, lies close to the current situation of governmental steering of academia where some measure of government interference in academic research for the greater — economic — good is seen to be warranted.

Therefore, although in the Neoclassical setting freedom of choice and academic freedom may be difficult to reconcile with each other, the degree to which freedom of choice may be able to support academic freedom, to a large extent, depends on the research choices dictated by research agendas. Nevertheless, the theoretical approach to investigating research steering presented here, hinging on philosophical concepts of (academic) freedom, may allow for a unique way of investigating and formulating research policy by studying the relationship between concepts of academic freedom and freedom of choice.

Answer to research question five

RQ5: To the extent that these policy implications increase researchers' freedom of choice, what does this imply for academic freedom as defended by Wilhelm von Humboldt, Immanuel Kant, and John Stuart Mill?

Answer to RQ5: First off, the context of the policy recommendations given here is a context where researchers are considered as utility maximisers, which comes with strong assumptions regarding the way (free) actions are taken. For this reason, there are difficulties in integrating concepts of freedom with different views on this; as is the case in Kant's transcendental freedom, which has influenced Kant's and Humboldt's conceptions of academic freedom. On the other hand, due to J. S. Mill's more utilitarian perspective which seems more concerned with the infringements such as the "silencing of opinion" rather than conditional support, there seems to be less inherent conflict between research steering through funding and Mill's academic freedom. For this reason, adequate implementation of policy recommendations that increase freedom of choice may be more compatible with Mill's view of academic freedom.

Despite the conceptual difficulties in combining freedom of choice that sees researchers as utility-maximisers with other conceptions of freedom, specifically Kant's transcendental freedom, there may be practical considerations which minimize the conflict between the two views of freedom involved. For example, even though researchers are seen as utility-maximisers, in theory, it is possible to adjust budgets and grant revenues such that the utility consideration has no effect on behaviour. Designing research agendas with this in mind could mean that researchers can make decisions on other, non-utility considerations. However, pursuing freedom through the equalisation of utility is closely reminiscent of the concept of *libertas indifferentiae* (liberty of indifference)⁴⁸, which also appears to be conceptually distinct to transcendental freedom (Ware, 2021). This could be indicative that freedom of choice and research steering based on the mechanism of financial incentives studied here, regardless of the choice structure or research, may never be compatible with academic freedom completely. Lastly, behaviour of utility-maximising agents is not defined when utility is equal among all choices, indicating that a different theory of agents' behaviour is necessary in this case.

With regards to Humboldt's view of the university for a place for development of the self, requirements of the freedom of choice seem to be stricter. Specifically, since steering through funding could be seen as an attempt to define the type of research that is (economically and academically) desirable, extra attention must be paid to designate a space within such a system for the kind of individual initiative which is necessary in Humboldt's conception of academic freedom. With regards to this, designating an adequate amount of funds towards research stemming from individual initiative without any thematic restrictions, and a minimal degree of socially defined restrictions, is necessary for striving for Humboldt's academic freedom with regards to research.

⁴⁸ "When no reason inclines me in one direction rather than another, I have a feeling of indifference – that is, of its not mattering which way I go – and that is the poorest kind of freedom" (Descartes, 1996, p. 21).

Committed researchers — foresighted or wrongly committed

The approach to measuring the freedom of choice of researchers presented here comes with a view of man as a maximiser of utility, which may or may not correspond to reality to varying degrees. The view that people's behaviour can, to a certain extent, be described by utility-maximisation seems to be a common view across many disciplines and is especially at home in Neoclassical economics (Karacuka & Zaman, 2012; Sen, 2005). But where does this leave the other acts or individuals unexplainable by maximisation of utility?

In the foreword to Albert Hirschman's (1997) *The Passions and the Interests*, Amartya Sen (1997) remarks that, in studying altruism by economically integrating the value of sympathy in personal gain or utility, that true commitment is left out. The point that Sen seems to be making here is that, by expressing sympathy in terms of utility, the implication is being made that, if the utility of not being sympathetic were still higher, these individuals would cease to show sympathy. Therefore, being altruistic in this way, regardless of the level of sympathy, fully depends on the value of alternatives and therefore cannot be 'true commitment'. Although studying commitment in this sense is not a primary objective of this study of research steering premised on utility-maximisation, an interesting exercise could be to see whether commitment in researchers can have implications for the utility-maximising research steered by financial incentives.

How would a truly committed researcher act under steering through utility-maximisation, who questions not based on alternatives, or in this case, lure of research incentives, but purely based on their own judgment? It should be noted that the behaviour of such a perfectly committed researcher — by theoretical construction — could not depend explicitly on the financial inputs which influence the utility of research choices, and, as such, they are difficult to explain and steer via utility-maximising mechanisms. However, because the dependence of committed behaviour on research agendas is ruled out, any correlation that does exist could have noteworthy implications.

For instance, consider that NWO's financial inputs and the decisions of the committed researcher correlate to some degree — that both NWO and the committed researcher pursue similar questions. This correlation could be due to circumstantial factors such as a common dependence on another factor. For example, NWO and committed researchers could be independently drawn to similar types of research. Conversely, we could also explore the possibility that there may be a dependence of NWO's research agenda on the committed researcher. The latter case would mean that, in designing the research agenda, NWO takes cues from committed researchers — considering NWO's role as a connector of academic, industrial, and governmental interests. This does not seem too far-fetched.

In the other case that there is little or no correlation between the behaviour of the committed researcher and NWO's research agenda, we may consider the effects of deviating from the kind of research which NWO incentivises. Specifically, we may consider how these effects may relate to the committed researcher's career. If NWO's incentives correlate with career benefits to researchers who follow them, then, due to competition with other, less committed, researchers, who may be more likely to follow these incentives and enjoy the corresponding career benefits, there could be negative consequences for committed researchers who may end up struggling to keep their careers afloat. From the perspective of NWO, however, this may not be a problem if NWO's sees that these committed researchers commit to 'wrong' or undesirable directions of research.

However, it could well be that these committed researchers are nevertheless able to secure other career benefits: for instance, a committed researcher whose field of study has recently gained relevance and has attracted academic attention. Cases like this may be purely circumstantial again or due to unique foresight on the part of the researcher. In the latter case, it may be in NWO's own best interest to take cues from this committed, 'foresighted' researcher. In due time, this type of committed researcher may become the committed researcher whose commitment inspires NWO's research agenda.

If NWO wishes to benefit from the unique, independent insight that committed researchers could bring, there is a potential risk which presents itself here. After all, the ability of foresighted researchers to obtain career benefits which do not depend on NWO's research agenda, may depend on NWO's research agenda itself. In particular, it appears reasonable that a strict research agenda which encompasses a large volume of research could prevent academic attention to deviate from the research agenda and thereby reward the foresighted researcher. In this case, there could be little to differentiate the foresighted researcher from the wrongly committed researcher, neither of which has been able draw academic research, and NWO could find it difficult to draw on their input in determining the best direction for national research.

To conclude, commitment according to Sen prevents steering by utility-maximising mechanisms to causally influence committed researchers. For that reason and from the perspective of NWO, committed researchers present an interesting case. On the one hand, committed researchers could conduct successful research independent to NWO's research agenda, and this could be valuable, not only because it may be valuable on its own, but because its independence could bring unique insight for designing research agendas of the future. On the other hand, committed researchers, like any researcher, could wrongly pursue questions which have little academic or societal value. However, because committed researchers may rely more on reward mechanisms that are not under the control of NWO's research agendas (if they didn't, dependence on NWO's steering would be implied under *ceteris paribus* assumptions), the ability to differentiate between the 'good' and 'bad' committed researchers depends on the availability of these independent reward mechanisms, which can be taken to imply that NWO's steering should have limits.

Choice and individuality

When considering freedom of choice in the context of utility-valued choices, choices are considered as being different to each other in value. Moreover, we consider this difference to matter in terms of the freedom that they provide — good choices contribute more to freedom of choice than bad ones. As presented by Robert Sugden (2003), considering preference among choices can bring some conceptual difficulties when freedom is seen as a space for individuality.

With *Opportunity as a space for individuality* (2003), Sugden explains a contradiction associated with *a priori* attaching value or preferences to choices when these choices represent the space for individuality. Due to a having to make certain assumptions about individuals and their preferences regarding choices when measuring freedom (of choice), Sugden concludes that no perfect measure of freedom exists when it is seen as a space for individuality. Sugden's conclusion carries some implications for a freedom of choice measure that aims to measure the space of choices valued by utility.

First, Sugden's conclusion implies that the measure of freedom of utility-valued choices presented here cannot serve as a measure of the space for individuality. Considering that researchers are assumed to be utility-maximisers, this concern could be dismissed by remarking that the strong assumptions made about researchers are intentionally describing an aspect of research steering. Sugden's argument about the impossibility of measuring freedom as a space for individuality could also be taken to imply that the space of utility-maximising researchers which is being measured could face difficulties in creating the space necessary for individuality. Therefore, if utility-maximising researchers accurately describe an aspect of research steering, Sugden's conclusion could also be interpreted normatively. In interpreting Sugden: utility-maximising research steering could have difficulties in creating a space for individuality because it imposes socially defined (economic) preferences on researchers, thus potentially limiting individual expression and initiative in research.

Furthermore, although individual expression is generally regarded as valuable, this space seems to be of special importance to academia and academic freedom in specific. The ability to produce something out of sheer individuality and to go against social norms, socially held beliefs, and dogma is an essential

aspect of academic freedom and the purpose of academia as seen by Wilhelm von Humboldt, Immanuel Kant, and John Stuart Mill.

John Stuart Mill's perspective in particular, as it is the one adopted by Sugden to study opportunity and individuality and as Mill's texts also discuss the role of economics, could be valuable in exploring the difficulties in creating a space for individuality in a context of social steering through economic incentives. Moreover, this appears to be related to Marginson's (2009) study on the need for the *radical-critical break* in academic research. Marginson (2009) refers to the capacity within academic work to engage in transformative critique and break away from existing knowledge paradigms to create new ideas which is perspective on academic freedom that appears to be closely related to Sugden's view of freedom as a space for individuality.

General discussion

As a way to describe research steering by national research agendas, the measure of freedom of choice of researchers under the influence of research agendas presented here can be seen as a specific study within the broader context of research on the university and academic freedom under NPM. By theoretically specifying a mechanism by which researchers are steered, this study carries some implications for existing research.

Comparison of the freedom of choice concept, which was identified as underpinning the steering of research, and academic freedom, highlighted some key points of conflict between the two. Foremost, the view of researchers as utility-maximisers and academic freedom seem to conflict with each other. This can be taken to mean that research steering which by similar financial incentives may have difficulties in supporting academic freedom as philosophically conceptualised. This finding can be seen as a specific result that fits within the context of Marginson's (2008; 2009) work on the difficulties in reconciling academic freedom with NPM and neoliberal theory more generally.

Through researchers' freedom of choice, this study shows that research steering by financial incentives could take place in the presence of individual utility functions, indicating that research as a whole may be steered despite the existence of individual freedoms. In particular, this implies that freedom of research can be interfered with despite the prevalence of individual preferences in researching, which could provide a theoretical explanation for the findings of Leišytė, Enders, and de Boer (2008) that research steering in the Netherlands seems to have little effect on the researcher's own experience regarding their freedom. Moreover, since research steering could be seen to influence researchers' preferences (see Chapter four), this could indicate problems in studying researchers' freedom on the basis of the fulfilment of preferences (which may already express a compromise or have been influenced)⁴⁹ (as is studied by Leišytė, Enders, and de Boer (2008)). Moreover, the view that research steering could occur by influencing preferences seems to align with Eisenberg's (1988) research on the effects of external research funding on academic values and self-interested academics.

Regarding Eisenberg's (1988) work, by studying conceptions of academic freedom, this research can be seen to provide an alternative theoretical perspective on the conflict between external research funding and academic freedom. Moreover, this research theoretically formalises Eisenberg's (1988) initial observations that the conflict arises from the actions of self-interested, financially dependent researchers by expressing this in utility-maximising behaviour.

Although this research focused on research choices, potential spill-over and network effects could suggest that research steering can influence decisions made by students and academics beyond the

⁴⁹ Influenced here can be taken to mean influence within an individual researcher, but also influence on researchers as a whole separate to individual researchers. An example of the latter would be the systematic removal of researchers with undesirable preferences. In this case, individuals need not alter preferences for the preferences of researchers as a whole to be altered.

immediate scope of research. For instance, higher funding for a particular research field could cause that field to attract to students and future academics. Consequently, students may be more likely to make choices in their studies that allow them to pursue careers in that field. Through such mechanisms, research steering via financial incentives may have broader implications for the academic landscape than initially apparent. The latter would mean that this research on the steering of research and NWO's policies are not just relevant for research, but for academia, and, in all likelihood, many aspects of society more broadly.

Lastly, from the perspective of the study of freedom of choice in a setting of utility-maximisation (Erlander, 2005; Rommeswinkel, 2021), this research provides a context of practical and further theoretical application and provides an alternative application on the behaviour of 'producers' rather than consumers.

Limitations and future research

Limitations of the research conducted here can be categorized into practical limitations and theoretical limitations.

Practical limitations of this research largely surround research done into NWO's own practices regarding the funding of projects. To start, although NWO's project database includes extensive data on funded projects, there is no available data on the number of rejected applications. The number of rejected applications, or to be more precise, the ratio of approved to total applications seems to be a key statistic in the estimation of utility — for instance, the expected financial revenue. Moreover, NWO's own communication has emphasised the importance of this figure in the determination of NWO research budgets and the design of research agenda (NWO, 2022c, pp. 13, 25, & 41).

In estimating the utility which drives behaviour of researchers, many assumptions must inevitably be made. As such there are many avenues for improving the accuracy of utility estimation. For example, the relationship between field of research and utility could be examined more thoroughly as it is plausible that some fields have higher budgetary needs for conducting research. Investigating the financial requirements of various research fields is crucial because the financial dependence of researchers influences their responsiveness to financial incentives. Furthermore, this financial dependence affects the perceived utility of certain grants, as a larger budget may not always result in higher utility when comparing between fields with differing budgetary requirements.

Another practical limitation of this research concerns NWO's naming of project schemes. NWO's naming of schemes does not appear to be always consistent. For instance, some projects will include the Dutch naming of the funding line, while others will include the English name (among many other inconsistencies). Additionally, within the same language two different projects can belong to the same funding line, while not being named the same: for example, 'open competition' and 'free competition' in Dutch. Due to these inconsistencies, this research could benefit from some data cleaning to enforce consistent funding line naming, although it seems unlikely that this would change trends and findings entirely.

Comparing this research to the existing body of literature on the measurement of freedom of choice exposes some of the limitations of this research and presents opportunities for further expansion. For example, measurement of freedom of choice was conducted without taking into account a degree of choice dissimilarity. However, choice dissimilarity seems to be a relevant characteristic of choices when it comes to the degree of freedom that it presents agents (Dowding & van Hees, 2009; Pattanaik & Xu, 2000). In the case of NWO's research agenda, this could be estimated by analysing the funding conditions funding line, which could be gathered from specific criteria and grant descriptions. Therefore, integrating choice dissimilarity in a future model of research steering built on the freedom of choice concept may allow for higher applicability and relevance.

Another limitation of this research is the limited applicability of the freedom of choice measure. The measure lacks practical applicability due to difficulties in accurately estimating the utility of options. An

additional limitation is the dependence on diversity rather freedom, which, although closely related, cannot be equated under all conditions (Dowding & van Hees). Identifying and formulating these conditions may allow for greater applicability of the measure. Moreover, on the theoretical side, there are also concerns regarding the viability of considering researchers as utility-maximisers in the first place. Although there seems to be a strong theoretical and empirical basis for studying researcher behaviour in this way, many authors stress the importance of taking into account behaviour that cannot be explained through utility-maximisation (Sen, 2005; Karacuka & Zaman, 2012). A promising direction of research with regards to this could be in the formalisation of non-utility-maximising behaviour within models of utility maximisation. Some authors have indicated that non-utility-maximising behaviour is critically important in the description of behaviour more generally (Sen, 2005; Karacuka & Zaman, 2012). For instance, with regards to Amartya Sen's 'commitment', efforts could be made to quantify and describe the effects of utility-maximising research steering on committed researchers. Research in this direction is promising because non-utility-maximising behaviour is, by definition, unsusceptible to this kind of research steering. Any correlation observed carries implications and as discussed here (see section *Committed researchers*), from these implications, possible design recommendations and theoretical implications can be derived.

Lastly, from the perspective of academic freedom, there might be a possibility to conduct research into various authors to see how a clearer conception of academic freedom could be formulated within the current perspective of NWO and the Dutch government. The three authors on academic freedom studied here each provide different, yet relevant, insights. Kant, who places emphasis on the authority of the State and its interest in achieving the welfare for its people, seems to resonate with NWO's role in designing the national research agenda according to international competitiveness. Conversely, in an age where the proportion of university graduates in the general population increased significantly, Humboldt's writings on the university as a place for self-cultivation could be of higher importance, and his recommendations for private universities could warrant further study and reconsideration. Lastly, J. S. Mill, who discusses academic freedom in relation to freedom of expression and truth could be relevant due to his writings having strong utilitarian traits and could thus help bridging the gap between NWO's instrumental view and the absolute freedom that seems to be part of academic freedom.

Conclusion

Main findings

This research began with the thesis that research funding could affect the direction of research. Accordingly, some implications for researchers' freedom in pursuing and exerting influence over the direction of research were studied.

The primary objective of this research was to study a concept of freedom which theoretically underpins research agendas. The usage of Sen's (1988) freedom of choice concept, which was identified as a suitable concept of freedom, allowed this study to examine some specific mechanisms through which research funding can distort the academic research agenda and interfere with researchers' freedom. The secondary objective of this research was to study the effects of research agendas on academic freedom according to its philosophical conceptions. This was approached through the lens of Sen's freedom of choice. This was attempted in order to better understand the conflict between research agendas and academic freedom and to examine how research agendas could be designed with academic freedom in mind. The findings and results of this research can therefore be grouped into the following categories: the freedom of choice of researchers and its measure, analysis regarding NWO's research agenda, implications regarding the design of research agendas, and implications regarding academic freedom.

As a result of the research, the measure of freedom of choice of researchers presented is valuable in two ways. Firstly, it elucidates a specific mechanism which seems to connect research steering by governmental funding institutions, such as NWO, with choices made by researchers and their freedom in making those choices. It clearly defines the type of freedom (of choice) and the implicit assumptions about researcher behaviour that seem to influence the steering of research. Additionally, it connects these factors with specific criteria for designing research agendas.

The analysis conducted on NWO's own policies yielded mixed results. A general conclusion is that, due to many layers of theoretical abstraction, the measure of freedom of choice has limited applicability in allowing this research to draw direct conclusions from real data. However, it does seem that this measure could have greater applicability with additional extensions, such as implementing choice dissimilarity — potentially allowing for greater modelling of researchers under the influence of financial incentives. As a supplementary research tool to more traditional methods, such as empirical and literature research on NWO's own documentation, the measure shows promise of applicability by being able to concisely capture complex trends in freedom of research and aid in focussing the attention of research as well as provide supplementary observations.

Similarly, the theoretically derived implications regarding the design of research agendas confirmed some of NWO's own documentation regarding their strategy. For example, when it comes to the recommendation of equalising utility among funding lines, this seems to be a factor that NWO takes into account significantly, as they have indicated that they are willing to improve the approval percentage of open competition grants. When it comes to the recommendations of relaxing thematic funding conditions, NWO also seems to take similar factors into account in their current policies. In combination with their documentation showing that they plan to increase the number of open competition projects, it appears that NWO aims to promote freedom of choice by relaxing thematic funding conditions on research as a whole.

When it comes to academic freedom, some conceptual problems arise in reconciling it with freedom of choice. Due to the Neoclassical theoretical underpinnings of freedom of choice, little room exists for the kind of individual initiative taken independently to utility considerations which is an important aspect of academic freedom according to Humboldt and Kant. Moreover, seeing researchers as utility-maximisers can be seen to conflict with views of freedom as a space for individuality, which are integral parts of academic freedom according to Humboldt and Mill. By attempting to theoretically describe

research steering, this conceptual conflict between freedom of choice and academic freedom can also potentially indicate a conflict between research steering and academic freedom; potentially shedding some contemporary light on Eisenberg's initial work. Moreover, via the policy recommendations given, research steering can, to an extent, be designed with academic freedom in mind. Specifically, un-themed research funding can be said to be important from Mill's and Humboldt's emphasised importance of individuality in academic freedom.

Overall, however, the theoretical approach and account of research steering presented here indicate that there may be value in a theoretical approach to questions regarding research policy and academic freedom. By putting forward a theoretical study of research steering which rests on the freedom of choice concept, this research allows research steering to be compared with concepts of academic freedom, thereby showing the potential that the study of these concepts could provide valuable insights for research policy.

Final thoughts — Where does this leave academic freedom?

What happens with academic freedom when its conceptions refer to the *intrinsic* value of truth, whereas governments and policymakers seem to be concerned with the *instrumental* value of knowledge? Is it important to see academic freedom, to a certain, perhaps limited extent, as absolute — that any infringement against it, no matter how slight or to what end, should not be endorsed? If so, how could such an absolute freedom be societally justified?

Regarding these questions and the current discourse surrounding academic freedom, few things, if any, seem to be widely understood and communicated clearly. Especially when it comes to the views of governmental institutions, but also in some academic literature, it seems that an abstract notion of academic freedom is referred to only when convenient and ignored when inconvenient. When it comes to a contemporary understanding of academic freedom — i.e., a coherent, self-contained, and justifiable concept of freedom pertaining to academia in relation to current socio-political and economic relations, which are undoubtedly different to those in the times of Kant, Humboldt, and Mill — a great deal of work remains to be done.

Regarding the relationship between the government and academic research mediated by NWO, any variable, including freedom of research, is seen as instrumental for the good of (Dutch) society. On the one hand, a freedom that exists conditionally — as long as it serves a predetermined end — can be said to be no real freedom at all. Yet on the other hand, the view that freedom necessarily leads to benefit, and is therefore valuable, appears to be widely accepted today. The task for a contemporary understanding of academic freedom today could be seen to be, within this view — where freedom exists instrumentally yet also leads to benefit —, to craft a space where a freedom relating to academic matters, in the pursuit of the social good of knowledge, can exist separate to its instrumental role such that it can exist unquestioned.

This task, to me, seems to be reminiscent of J. S. Mill's approach to defending liberty in *On liberty*. J. S. Mill, although a utilitarian in many ways, holds freedom in a somewhat absolute regard — more absolute than, for example, the Dutch government through NWO. This unique, seemingly contradictory, characteristic of J. S. Mill, I would say, is closely related to his view regarding knowledge and human fallibility.

Following J. S. Mill, even the most devoted utilitarian may have to accept a space where utility considerations cannot enter: namely, the unknown. Yet, because he is fallible, the unknown may be anywhere, and therefore by acting on — that is, maximising — utility everywhere as though it were an *a priori* given, he is bound to lose out on some higher, yet unknown, utility. To me, J. S. Mill's freedom of expression and diversity are a remedy for this problem — they can serve to explore the unknown to strive for a higher, not easily uncovered, utility. At the same time, infringing upon this freedom is difficult to

justify since the (fallible) knowledge that justifies infringement depends on the yet unknown being able to be expressed *freely*.

Following a similar argument, in designing the optimal course of research, NWO must also deal with the fact that it may not know the optimal course of research. It can make an educated estimate, but if it enforces a predetermined direction too strictly, it may not allow researchers to find other courses of research that are perhaps better suited to NWO's objectives, or even that researchers may find better objectives. Similarly, NWO cannot easily justify infringing upon the free space for researchers to explore the optimal course of research, since what is needed to justifiably constrain this freedom is knowledge about the optimal course of research — knowledge which depends on the free exploration of possible courses of research.

This Millian argument can be seen to defend a space for unconditionally free research grounded in 'humble utilitarianism', yet the question for how large this space of unquestioned freedom should be — how much unquestioned, free research is *necessary* — remains. This question seems to be often overlooked, but it is important in thinking of a societally justifiable academic freedom. After all, that knowledge is instrumentally and economically valuable is a widely accepted view and, as an economic good, knowledge is subjected to the same scrutiny and interference that we apply to other economic goods — where today, free market ideals seem far removed from political and economic realities. In this political and economic context, to argue that, not just some, but all research should be unconditionally free could do more harm than good. In thinking about academic freedom, questions like these are difficult and far from answered.

Instead, I propose that we think of these questions and academic freedom in terms of relations rather than definite answers. For instance, seeing that unconditional freedom arises from utility not always being known, we could proceed to think that the necessary space for unconditional freedom in the pursuit of knowledge should relate to what we think to not know. More concretely, the necessary space for unconditional *freedom* in the pursuit of knowledge could be seen to depend on or correlate with our *uncertainty* regarding the social value of knowledge and our *uncertainty* on how we should direct our pursuit of knowledge with respect to the social good. In simpler words: the less certain we are about where we should go, the greater the space for unquestioned freedom in the pursuit of knowledge should be.

Thinking of academic freedom in this way may grant it some needed separation from instrumental considerations — avoiding the predicament of seeing freedom in terms of utility, instead relating freedom to the utility of the not yet known.

References

- AAUP. (1915). Declaration of Principles on Academic Freedom and Academic Tenure. *AAUP*.
- Abbott, A., Cyranoski, D., Jones, N., Maher, B., Schiermeier, Q., & Van Noorden, R. (2010). Do metrics matter? Many researchers believe that quantitative metrics determine who gets hired and who gets promoted at their institutions. With an exclusive poll and interviews, *Nature* probes to what extent metrics are really used that way. *Nature*, 465(7300), 860-863.
- Aghion, P., Howitt, P., Brant-Collett, M., & García-Peñalosa, C. (1998). *Endogenous growth theory*. MIT press.
- Åkerlind, G. S., & Kayrooz, C. (2003). Understanding academic freedom: The views of social scientists. *Higher Education Research & Development*, 22(3), 327-344.
- Albritton Jr, F. P. (2006). Humboldt's unity of research and teaching: influence on the philosophy and development of US higher education. Available at SSRN 939811.
- Anderson, R. D. (2020). German (Humboldtian) University Tradition, The. *The International Encyclopedia of Higher Education Systems and Institutions*, 546-551.
- Arnsperger, C., & Varoufakis, Y. (2006). What Is Neoclassical Economics? The three axioms responsible for its theoretical oeuvre, practical irrelevance and, thus, discursive power. *Panoeconomicus*, 53(1), 5-18.
- Badley, G. (2009). A place from where to speak: The university and academic freedom. *British Journal of Educational Studies*, 57(2), 146-163.
- Bahti, T. (1987). Histories of the university: Kant and Humboldt. *MLN*, 102(3), 437-460.
- Becker, D. (2022). Has Academic Freedom Failed? Can Liberalism Defend It?. *Compass: An Undergraduate Journal of American Political Ideas*, 3(1), 4.
- Berman, E. P. (2011). Creating the market university: How academic science became an economic engine. *Princeton University Press*.
- Burrow, J.W. (1969). Editor's Introduction. In *The Limits of State Action*, ed. Wilhelm von Humboldt. Cambridge: Cambridge University Press.
- Carter, I. (2004). Choice, freedom, and freedom of choice. *Social Choice and Welfare*, 22, 61-81.
- Carter, I., "Positive and Negative Liberty", *The Stanford Encyclopedia of Philosophy* (Spring 2022 Edition), Edward N. Zalta (ed.), URL = <<https://plato-stanford-edu.tudelft.idm.oclc.org/archives/spr2022/entries/liberty-positive-negative/>>.
- CBS. (2024). Onderwijs; uitgaven aan onderwijs en CBS/OESO indicatoren. URL = <<https://opendata.cbs.nl/statline/#/CBS/nl/dataset/80393ned/table?dl=9C1A6>>
- Chen, T. Y., Rommeswinkel, H., Wang, G. Y., & Yang, T. S. (2020). Measuring Consumer Freedom.
- Cote, N (2021). *Measuring freedom, and its value*. Diss. London School of Economics and Political Science.

- Dennis, & Gabor, A. (1979). The application of entropy to the measurement of social and economic freedom. *International Journal of Social Economics*, 6(5), 415-428.
- De Uriarte, B. (1990). On the free will of rational agents in neoclassical economics. *Journal of Post Keynesian Economics*, 12(4), 605-617.
- Descartes, R. (2020). Descartes' meditations on first philosophy. Lindhardt og Ringhof.
- Dowding, K., & Van Hees, M. (2009). Freedom of Choice.
- Edler, J., & Fagerberg, J. (2017). Innovation policy: what, why, and how. *Oxford Review of Economic Policy*, 33(1), 2-23.
- Eisenberg, R. S. (1988). Academic freedom and academic values in sponsored research. *Tex. L. Rev.*, 66, 1363.
- Enders, J., Kehm, B. M., & Schimank, U. (2014). Turning universities into actors on quasi-markets: How new public management reforms affect academic research. In *The changing governance of higher education and research: Multilevel perspectives* (pp. 89-103). Cham: Springer International Publishing.
- Erlander, S. (2005). Welfare, freedom of choice and composite utility in the logit model. *Social Choice and Welfare*, 24(3), 509-525.
- Filip, B. (2020). The Neo-Liberal Concept of Freedom: Economic and Negative Freedom. *The Rise of Neo-liberalism and the Decline of Freedom*, 29-55.
- Filip, B. (2020). *The Rise of Neo-liberalism and the Decline of Freedom*. Cham: Palgrave Macmillan.
- Filip, B., & Moggach, D. (2018) Between Leibniz and Kant: The political thought of Wilhelm von Humboldt, *The European Legacy* 23 (5) pp. 538–553.
- Foucault, M. (2010) *The birth of biopolitics: Lectures at the Collège de France 1978- 1979*, trans. G. Burchell. Basingstoke: Palgrave MacMillan.
- Fuller, S. (2009). The genealogy of judgement: towards a deep history of academic freedom. *British Journal of Educational Studies*, 57(2), 164-177.
- Geuna, A. (2001). The changing rationale for European university research funding: are there negative unintended consequences?. *Journal of economic issues*, 35(3), 607-632.
- Gläser, J., & Laudel, G. (2016). Governing science: How science policy shapes research content. *European Journal of sociology/Archives Européennes de sociologie*, 57(1), 117-168.
- Gläser, J. (2019). How can governance change research content? Linking science policy studies to the sociology of science. In *Handbook on science and public policy* (pp. 419-447). Edward Elgar Publishing.
- Gornitzka, Å., & Maassen, P. (2000). Hybrid steering approaches with respect to European higher education. *Higher education policy*, 13(3), 267-285.

- Hirschman, A. O. (1977). *The Passions and the Interests: Political Arguments for Capitalism before Its Triumph*.
- Hölttä, S. (1998). The funding of universities in Finland: Towards goal-oriented government steering. *European Journal of Education*, 33(1), 55-63.
- Jones, D. G., Galvin, K., & Woodhouse, D. (2000). *Universities as critic and conscience of society: The role of academic freedom*. Wellington, New Zealand: New Zealand Universities Academic Audit Unit.
- Jones, C. I. (2019). Paul Romer: Ideas, nonrivalry, and endogenous growth. *The Scandinavian Journal of Economics*, 121(3), 859-883.
- Jongbloed, B. (2007). Steering the Dutch academic research enterprise: Universities' responses to project funding and performance monitoring. In *The research mission of the university* (pp. 95-131). Brill.
- Kant, I. (1989). *The Conflict of the Faculties= Der Streit der Fakultäten*. Abaris Books, Inc. 24 West 40th Street, New York, New York, 10018.
- Karacuka, M., & Zaman, A. (2012). The empirical evidence against neoclassical utility theory: a review of the literature. *International Journal of Pluralism and Economics Education*, 3(4), 366-414.
- Kivistö, J. (2007). *Agency theory as a framework for the government-university relationship*. Tampere University Press.
- Kreyenbühl, J. (2023). die ethische Freiheit bei Kant. *Philosophische Monatshefte*.
- Krull, W. (2005). *Exporting the Humboldtian university*.
- Lackey, J. (Ed.). (2018). *Academic freedom*. Oxford University Press.
- Leišytė, L., Enders, J., & De Boer, H. (2008). The freedom to set research agendas—illusion and reality of the research units in the Dutch universities. *Higher education policy*, 21, 377-391.
- Leišytė, L. (2016). New public management and research productivity—a precarious state of affairs of academic work in the Netherlands. *Studies in Higher Education*, 41(5), 828-846.
- Leišytė, L. (2007). *University governance and academic research: Case studies of research units in Dutch and English universities*.
- Leišytė, L. (2006). The effects of New Public Management on research practices in English and Dutch universities.
- Marginson, S. (2008). Academic creativity under new public management: Foundations for an investigation. *Educational theory*, 58(3), 269-287.
- Marginson, S. (2009). Hayekian neo-liberalism and academic freedom. *Contemporary Readings in Law and Social Justice*, 1(1), 86-114.

- MacCallum, G. C. (1967). Negative and Positive Freedom. *The Philosophical Review*, 76(3), 312-334.
- McLear, C. (2020). On the Transcendental Freedom of the Intellect.
- Mill, J. S. (2001). ON LIBERTY. *Batoche Books Limited*.
- Miyagi, T., & Morisugi, H. (1996). A direct measure of the value of choice-freedom. *Papers in Regional Science*, 75(2), 121-134.
- Moggach, D. (2021). 11 The Limits of State Action Humboldt, Dalberg, and Perfectionism after Kant. *Practical Philosophy from Kant to Hegel: Freedom, Right, and Revolution*, 192.
- Moutsios, S. (2012). Academic autonomy and the Bologna process. *Aarhus: Epoke*.
- Nerlich, B., & Clarke, D. (2009). Wilhelm von Humboldt. Culture and Language Use. Eds Gunter Senft, Jan-Ola Östman and Jef Verschueren. Amsterdam: John Benjamins, 173-184.
- NWO. (2021). *NWO Open Access policy for projects funded from 1-1-2016 to 1-1-2021*. URL = <https://www.nwo.nl/sites/nwo/files/media-files/NWO%20Open%20Access%20policy%202016-2020_ENG_0.pdf>
- NWO. (2022). Wetenschap werkt | NWO strategie 2023-2026. In NWO. Retrieved February 16, 2024, from https://www.nwo.nl/sites/nwo/files/media-files/NWO_strategie-Wetenschap-werkt_2023-2026.pdf
- NWO. (2022b). NWO-I Bestuursverslag en jaarrekening 2022. In NWO. Retrieved June 2, 2024, from <https://www.nwo-i.nl/wp-content/uploads/2023/08/NWO-I-Bestuursverslag-en-Jaarrekening-2022.pdf>
- NWO. (2022c). NWO Jaarverslag 2022. In NWO. Retrieved June 2, 2024, from <https://www.nwo.nl/sites/nwo/files/media-files/NWO%20jaarverslag%202022.pdf>
- Olssen, M., & Peters, M. A. (2005). Neoliberalism, higher education and the knowledge economy: From the free market to knowledge capitalism. *Journal of education policy*, 20(3), 313-345.
- Östling, J. (2018). *Humboldt and the modern German university: An intellectual history*. Lund University Press.
- Pascal, E. (2021). Academic Freedom is the Freedom to Know. hal-03639043
- Pattanaik, P. K., & Xu, Y. (2000). On diversity and freedom of choice. *Mathematical Social Sciences*, 40(2), 123-130.
- Pereboom, D. (2006). Kant on Transcendental Freedom 1. *Philosophy and Phenomenological Research*, 73(3), 537-567.
- Pereira-Puga, M., & Sanz-Menéndez, L. (2024). Steering at a distance: research centre funding schemes as instruments for university change. *Science and Public Policy*, scae005.
- Plato. (2000). The Republic (Benjamin Jowett translation). *Dover Publications*.

- Rathenau Instituut. (2023). *Science in Figures — Publications*. <https://www.rathenau.nl/en/science-figures/output/publications>
- Romer, P. M. (1990). Endogenous technological change. *Journal of political Economy*, 98(5, Part 2), S71-S102.U
- Romer, P. M. (1994). The origins of endogenous growth. *Journal of Economic perspectives*, 8(1), 3-22.
- Romer, P. M. (1992). Two Strategies for Economic Development: Using Ideas and Producing Ideas. *The World Bank Economic Review*, 6(suppl 1), 63-91.
- Rommewinkel, H., Measuring Consumer Freedom (March 19, 2021). Measuring Consumer Freedom. Available at SSRN: <https://ssrn-com.tudelft.idm.oclc.org/abstract=3807668>
- Sen, A. (1973). Behaviour and the Concept of Preference. *Economica*, 40(159), 241-259.
- Sen, A. (1988). Freedom of choice: concept and content. *European economic review*, 32(2-3), 269-294.
- Sen, A. (1990). Individual freedom as social commitment. *India International Centre Quarterly*, 17(1), 101-115.
- Sen, A. (1997). Foreword to Albert O. Hirschman (1997) *The Passions and the Interests*. Political Arguments for Capitalism Before its Triumph.
- Sen, A. (2002). *Rationality and freedom*. Harvard University Press.
- Sen, A. (2005). Why exactly is commitment important for rationality?. *Economics & Philosophy*, 21(1), 5-14.
- Sen, A. (2020). The possibility of social choice. In *Shaping Entrepreneurship Research* (pp. 298-339). Routledge.
- SHILS, E. (1993). Do We Still Need Academic Freedom? *The American Scholar*, 62(2), 187–209. <http://www.jstor.org/stable/41212089>
- Sugden, R. (2003). Opportunity as a space for individuality: its value and the impossibility of measuring it. *Ethics*, 113(4), 783-809.
- Suppes, P. (1996). The nature and measurement of freedom. *Social Choice and Welfare*, 13(2), 183-200.
- Van den Belt, H., Jansen, A., Keulartz, F. W. J., Valkema, F., & van der Weele, C. N. (2008). Global change and biotechnology. *Comm. Genet. Modif. Rep. CGM* 2008, 6.
- Ware, O. (2023). Kant on Freedom. *Elements in the Philosophy of Immanuel Kant*.
- Worgul, G.S. (Ed.). (1992). *Issues in academic freedom*. Pittsburgh: Duquesne University Press.
- Yudof, M. G. (1986). Three faces of academic freedom. *Loy. L. Rev.*, 32, 831.

Zezeza, P. T. (2003). Academic freedom in the neo-liberal order: Governments, globalization, governance, and gender. *Journal of Higher Education in Africa/Revue de l'enseignement supérieur en Afrique*, 149-194.

Appendix

Figure 3: Entropy, Maximum Entropy, and Total Projects 1997-2023

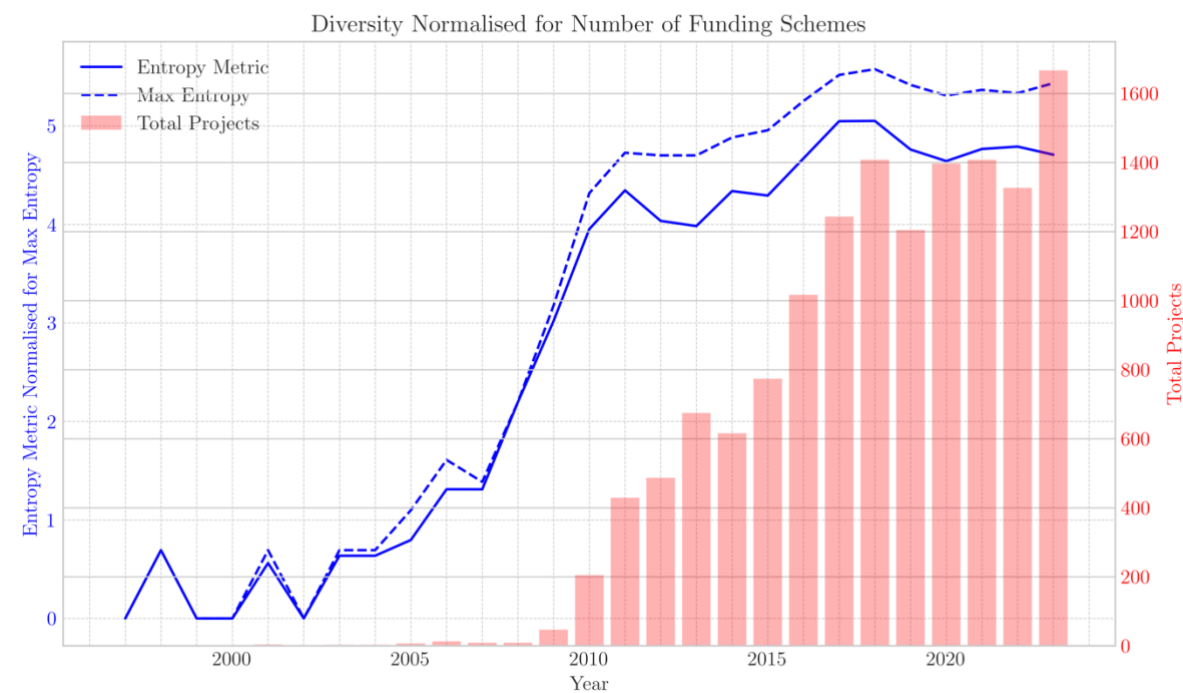


Table 3: All relevant processed Data retrieved from NWO

YEAR	Number of Projects	# Funding Schemes	Entropy Metric	Maximum entropy	Ratio
1997	1	1	0.0	0	0
1998	2	1	0.0	0	0
1999	2	1	0.0	0	0
2000	0	0	0.0	NAN	0
2001	4	2	0.56(2)	0,69(3)	0,81(1)
2002	1	1	0.00	0	0
2003	3	2	0.63(7)	0,69(3)	0,91(9)
2004	3	2	0.63(7)	0,69(3)	0,91(9)
2005	7	3	0.79(6)	1,09(9)	0,72(5)
2006	13	5	1.31(1)	1,60(9)	0,81(5)
2007	9	4	1.31(0)	1,38(6)	0,94(5)
2008	9	9	2.19(7)	2,19(7)	1,00(0)
2009	47	24	3.02(0)	3,17(8)	0,95(0)
2010	205	75	3.95(3)	4,31(7)	0,91(6)
2011	429	113	4.34(5)	4,72(7)	0,91(9)
2012	487	110	4.03(6)	4,70(0)	0,85(9)
2013	675	110	3.98(3)	4,70(0)	0,84(7)
2014	616	132	4.33(8)	4,88(3)	0,88(8)
2015	774	142	4.29(3)	4,95(6)	0,86(6)
2016	1017	191	4.67(0)	5,25(2)	0,88(9)
2017	1244	249	5.04(8)	5,51(7)	0,91(5)
2018	1408	264	5.05(0)	5,57(6)	0,90(6)
2019	1205	225	4.76(0)	5,41(6)	0,87(9)
2020	1397	202	4.64(3)	5,30(8)	0,87(5)
2021	1408	214	4.76(6)	5,36(6)	0,88(8)
2022	1327	207	4.79(0)	5,33(3)	0,89(8)
2023	1667	229	4.70(8)	5,43(4)	0,86(6)

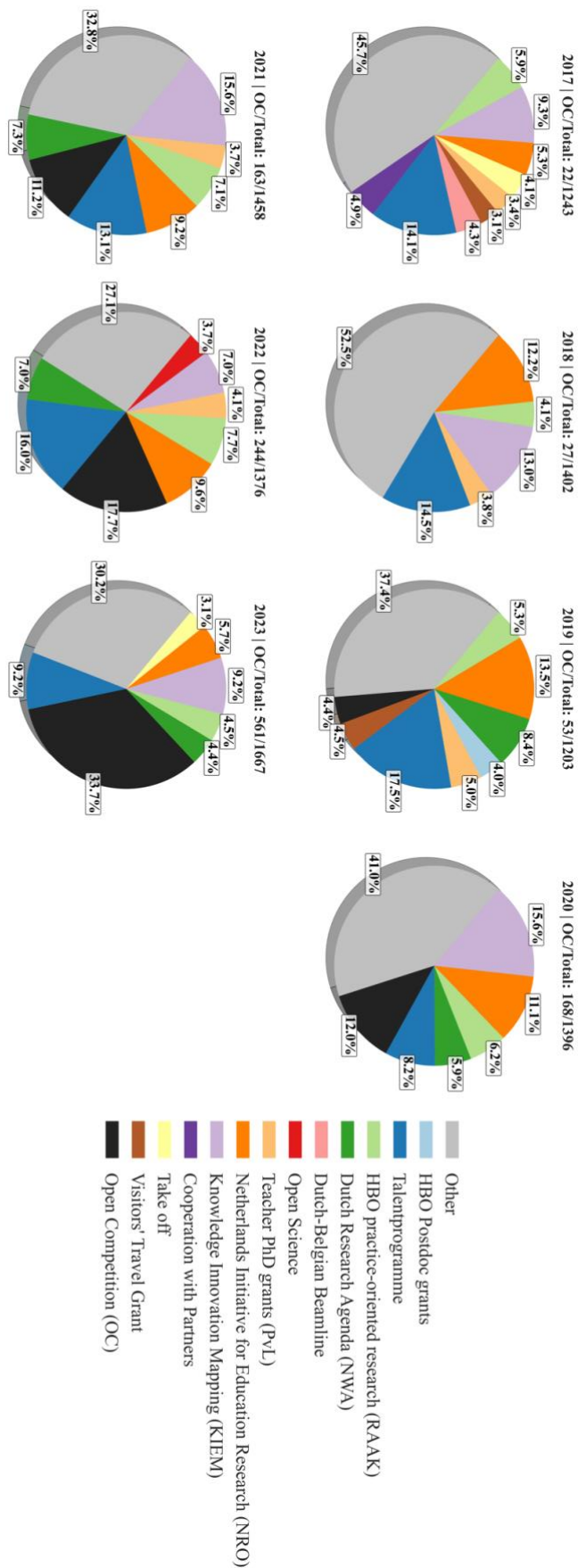


Figure 4: Pie Charts for 2017-2023. Here smaller categories were manually included in larger categories. The 'Other' category represents funding lines with less than 3.0% of projects. Note that, at the time of the creation of this chart, page 103 (out of 158) of NWO's database was inaccessible, so there will be small discrepancies in comparison with the other graphs and data.

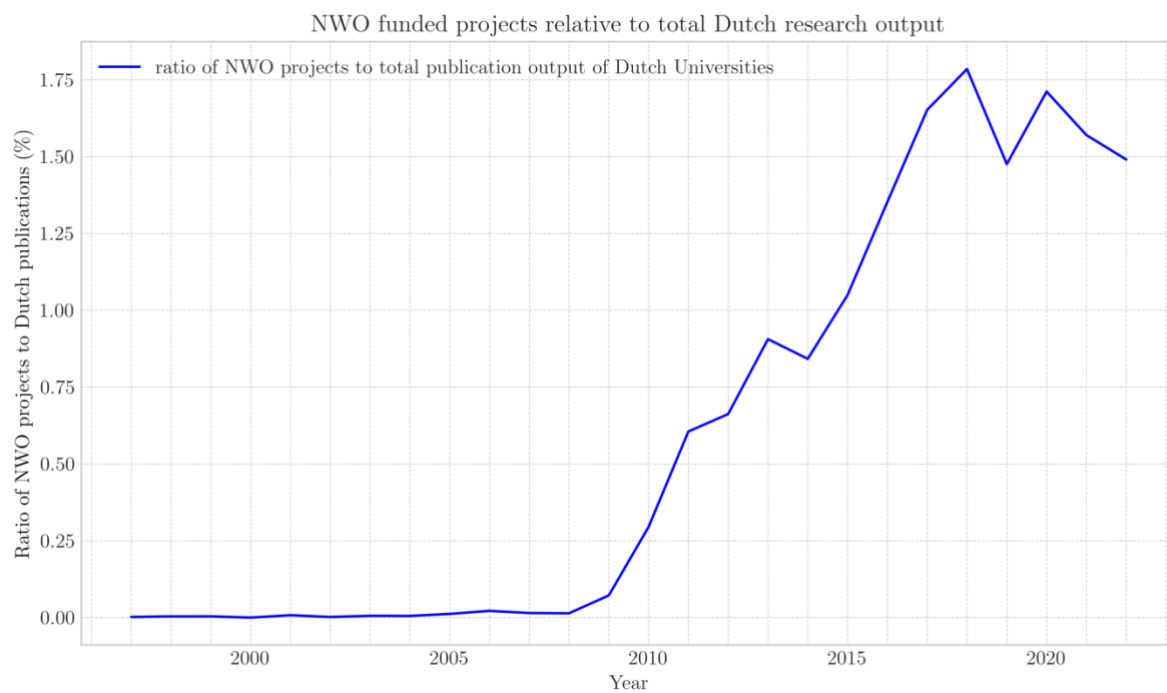


Figure 5: Number of NWO-funded projects and total number of publications by Dutch universities in that year. The number of Dutch publications in total is retrieved from Rathenau Instituut (2023).