

Knut Klonteig Nielsen & Fredrik Riiser

How "soft" is soft funding?

An explorative study of legitimacy in public financing

Master's thesis in MIENTRE

Supervisor: Marius Tuft Mathisen

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Abstract

As nascent ventures face liabilities of newness and smallness, securing grant financing from the public financing system becomes an exercise in building and maintaining legitimacy for their grant proposals. Under conditions of informational asymmetries, grant proposal writers have several mechanisms at their disposal which they can use to maximise their chances for success in public grant competitions. By taking the demand-side perspective and following four Norwegian NTBFs with high success rates in the public financing system, we are able to describe firm-level behaviour and motivations which yield valuable insights into potential weaknesses and vulnerabilities in different designs of public financing schemes.

In this thesis, we introduce a theoretical framework for describing legitimacy attainment in public financing under conditions of information asymmetry in the context of grant proposals. Our findings lead us to propose four generalised propositions regarding how NTBFs work to maximise their chances for success in the public financing system. We find that successful proposal writers attain legitimacy for their proposals using cognitive, regulatory, normative and proximal legitimacy-building devices, with the intention that these devices are picked up by their audience, grant evaluators, as signals of legitimacy. These legitimacy-building devices are usually drawn from information about the firm and its environment, but firms also demonstrate opportunistic behaviour by exploiting conditions of information asymmetries to manipulate claims and information, knowing that grant evaluators are limited in their ability to scrutinise claims past the information contained in the grant application deliverance.

We connect our findings to mechanisms and structures in grant financing that influence how susceptible grant agencies are to these opportunistic and sometimes adverse behaviours. Our findings suggest that grant programmes with single-staged screening processes, high public funding intensities or unlimited eligible grant submission attempts should take extra care to familiarise themselves with the potential vulnerabilities, heuristics and biases they are exposing themselves to in their assessments of potential grantees.

By taking the demand-side perspective of grant applicants pursuing opportunities in the public financing system exhaustively, our research presents an alternative avenue for research into effective designs of public financing systems, with the ultimate goal of yielding higher societal returns, both economically and socially, through more effective technology transfer between academia and industry and realisation of new technologies that enhance our quality of life.

Sammendrag

Unge teknologiselskaper møter utfordringer ved å være små og nye, og med lite å vise til av teknologisk, organisasjonsmessig eller markedsmessig utvikling, blir det å sikre finansiering fra det offentlige virkemiddelapparatet en utfordrende øvelse i å bygge legitimitet. Under forhold preget av informasjonsasymmetri har søknadsskrivere mange ulike mekanismer de kan bruke for å øke sine sjanser for suksess i konkurransen om offentlig finansiering. Ved å ta perspektivet til etterspørselssiden og følge fire norske nye teknologibaserte selskaper med høye suksesser i det offentlige virkemiddelsystemet kan vi beskrive disse selskapenes oppførsel og motivasjoner som fører til verdifull innsikt i potensielle svakheter og sårbarheter i ulike måter å strukturere offentlige virkemidler for innovasjon og nyskaping.

I denne oppgaven introduserer vi et teoretisk rammeverk for å beskrive hvordan selskaper tilegner seg og opprettholder legitimitet under informasjonsasymmetriske forhold i kontekst av søknader til offentlige støtteordninger. Våre funn leder oss til å foreslå fire generaliserte observasjoner om hvordan nye teknologibaserte selskaper kan maksimere sine sjanser for suksess i det offentlige virkemiddelapparatet. Vi finner at suksessfulle søknadsskrivere tilegner seg legitimitet ved hjelp av regulative, kognitive, normative og proksimale legitimitetsbyggende virkemidler, med intensjon om at disse virkemidlene plukkes opp av deres publikum, evaluatorene, som signaler av legitimitet. Disse legitimitetsbyggende virkemidlene baseres vanligvis på informasjon om selskapet og dets tilknyttede miljø, men selskaper demonstrerer også opportunistisk oppførsel ved å utnytte informasjonsasymmetriske forhold ved å manipulere påstander og informasjon, vel vitende om at evaluatorene har begrensede muligheter for å ettergå disse påstandene utenom informasjonen som eksisterer i selve søknadsteksten.

Vi knytter funnene våre til mekanismer og strukturer i offentlige støtteordninger som påvirker i hvilken grad offentlige finansieringsinstitusjoner gjør seg mottakelige for denne opportunistiske og til tider uønskede oppførselen. Våre funn indikerer at offentlige støtteprogrammer med ett-trinns vurdering, virkemidler med høy grad av støtteintensitet, samt programmer med uendelig antall tillatte forsøk er ekstra sårbarhetene for ovennevnte opportunistiske oppførsel blant søknadsmassen, og at slike programmer bør ta ekstra hensyn til mulighetsrommet deres søkere har for å påvirke deres vurderinger.

Ved å ta perspektivet til etterspørselssiden i det offentlige virkemiddelapparatet og følge et utvalg av suksessfulle søkere som har maksimert av offentlig støtte som sin sentrale finansieringsstrategi presenterer vi en alternativ innfallsvinkel til forskning på design av offentlige virkemidler. Det endelige målet med denne forskningen er å føre til høyere økonomisk og sosial samfunnsmessig avkastning fra investeringer i offentlige innovasjonsvirkemidler gjennom mer effektiv teknologioverføring mellom akademia og industri, samt realisering av nye teknologier som kan forbedre vår velferd og livskvalitet.

Preface

As an entrepreneur, the search for start-up capital can be exhausting and difficult. With little to show for except vision and drive, pitching to private investors can feel more like an exercise in dealing with rejection rather than a genuine attempt at fundraising. Luckily, there are other options: Most countries have established public financing systems that provide grants to aspiring entrepreneurs, and these grants often represent a rare opportunity for young ventures to raise initial capital and prove their idea.

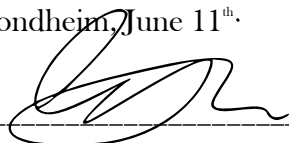
This thesis was written by two graduate students at the Norwegian University of Science and Technology's School of Entrepreneurship. Beside their regular course program, both authors have also established new technology-based firms and have been involved closely with the European and Norwegian public funding systems in the financing of these firms. Indeed, one of the authors has pursued public funding opportunities on regional, national and international levels exhaustively, and has found some success in doing so. Through these experiences, some interesting observations have emerged which are seemingly not covered by existing literature.

As entrepreneurs, both authors have personally experienced the massive impact a significant grant can have on a young firm. Being awarded a significant grant can have a tremendous effect in terms of employment, product development activities and access to research infrastructure. Indeed, as many firms struggle to raise capital from other sources, grant financing can be the difference between zero and one, allowing entrepreneurs to fully dedicate themselves to maximising the potential of their idea.

However, as the opportunities for public funding grow more numerous and valuable, competition amongst grant applicants tighten. Often competing against thousands of other applicants, writing a good grant proposal which sticks out from the rest of the competition becomes a valuable skill. Experts who are well-versed in proposal writing seem to know which buttons to push in order for their application to be received positively by the assessing grant agency. This is why we chose to perform this study, because how can it be that some people, professional or not, can consistently achieve higher success rates than others in the public grant system?

We hope and believe this thesis will contribute to bettering our understanding of how NTBFs make use of the opportunities presented to them in the public financing system, and that the implications presented in this thesis will contribute to a better public funding system for policy-makers and NTBFs alike.

Trondheim, June 11th.



Knut Klonteig Nielsen



Fredrik Ruiser

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III. List of abbreviations

Abbreviations and Acronyms used Throughout the Thesis

SF	Soft Funding
RC	Risk-Capital
NTBF	New Technology-Based Firm
USO	University Spin-off
IA	Information Asymmetry
PGPA	Professional Grant Proposal Agency
GVC	Government Venture Capital
ICV	Independent Venture Capital
VC	Venture Capital
IP	Intellectual Property
RCN	Research Council of Norway
IN	Innovation Norway
SME	Small or Medium-sized Enterprise
EU	European Union
EEA	European Economic Area
EC	European Commission
GBER	General Block Exemption Regulation (EC regulation no. 651/2014)
CRM	Corporate Resource Management

CHAPTER 1

INTRODUCTION

New technology-based firms (NTBFs) typically develop new technologies which are often characterized by long development paths and involve high degrees of uncertainty. They also lack the organizational track-record and legitimacy of established firms (Fischer, Lahiri, & Kotha, 2016; Hannan & Freeman, 1984), which, from the perspective of a new venture often means that conventional sources of risk capital like private investors (business angels) or professional financial institutions like venture capitalist (VC) firms or banks are out of reach in the venture's earliest phases (Stinchcombe, 1965). This lack of availability of risk capital for early-stage NTBFs due to their high degree of uncertainty is often referred to as the "funding gap" or "Macmillan Gap" (Macmillan, 1931).

As a countermeasure to this shortfall of the risk capital market, governments worldwide have introduced public financing programs which provide start-up capital for NTBFs in the form of research and innovation grants. Across regional, national and international grant financing agencies, the public financing system offers a range of non-equity backed financing options for NTBFs to validate their business ideas to a point where they have reduced some of their technical, organizational and commercial uncertainties (Rasmussen & Sørheim, 2012).

As a second objective, public financing schemes are also designed to increase the overall pool of surviving NTBFs, ultimately generating economic and social gains through their successful transitioning into established, self-sustained firms. However, the economic and social balancing of public financing as an investment vessel on behalf of the taxpayers is a subject of controversy in previous literature. As we will argue, the lack of insight into the economic and societal effectiveness of public financing can be seen as a two-sided problem, where further research is needed on both the supply- and demand sides.

On the supply-side, we review the literature streams on public grant financing and its effectiveness in fulfilling its two central objectives: 1) Providing start-up capital to firms that are too uncertain to attract investments from conventional risk capital markets, and 2) picking high-quality investment objects with sufficient growth potential to generate economic and social returns for society in the long term (Lerner, 2002; Silva & Carreira, 2017).

On the demand side, we present a qualitative study describing the behaviours and entrepreneurial activities NTBFs undertake to succeed in the public financing system, exploring how the different structures in the grant system are perceived by the applicant base of public grant programmes. This applicant base is ultimately what makes up the total pool of investment opportunities for the public financing agency, so understanding how different structures and mechanisms in public financing are exploited by these firms is another approach to researching effective designs of grant programmes.

From the entrepreneur and potential grant applicant's perspective, the landscape of public financing is rich with opportunities. Grant options range from local or regional grant schemes such as a university or municipality-administered grants; to national grants, commonly administered by a government-appointed research council or other independent agency; and even international grants, such as the multitude of EU-wide grant agencies and programmes. The significant accumulated values tied up among the range of regional, national and international grant systems has made the public grant system a highly competitive arena among NTBFs. As an example, the EU will administer more than €12 billion in research and development (R&D) grants through its Horizon2020 program (H2020) in 2019 alone (European Commission, 2018). In some programmes, like the "SME-Instrument", a public grant program under the H2020 umbrella, the statistical success rate of grant applicants can range as low as 3-6% (Publications Office of the European Union, 2018).

As we will argue, the written grant proposal is the most important determinant of grant success, as it is the first (and sometimes only) step in any grant programme's screening processes. This makes the grant proposal development process a natural focus point for NTBFs working to maximise their chances of receiving grant funding. Knowing that the odds may be heavily stacked against you, making your proposal stand out among thousands of applications is a daunting challenge, and one that can be tackled in a variety of ways: Some firms turn to specialised consultants for assistance in developing their proposals, while others choose to develop their proposals in-house. Interestingly, professional agencies that specialise in writing grant proposals oftentimes advertise success rates that are many multiples higher than statistical averages: To stay with the example of the H2020 SME-Instrument, some agencies advertise success rates upwards of 40%, which is upwards of ten times the statistical average. However, it is not only specialised professionals that demonstrate an abnormally high success rates. There are numerous examples and anecdotal evidence of certain NTBFs that excel in grant competitions, beating the odds time and time again.

The observation that certain proposal writers, whether professional or not, can display consistently higher success rates than others, is what initially spurred our interest to undertake this study, as it raises some interesting questions regarding the behaviours and circumstances

that surround these highly successful firms and their work with public funding. What is it that these proposal writers get right that others do not? Are their high success rates tied to the underlying qualities of their firms or projects, or are their techniques and processes generalizable? In exploring this phenomenon, we propose the following research question:

RQ: How do new technology-based firms maximise their chances of success in the public grant system?

We attempt to answer this research question by performing an in-depth empirical study on NTBFs with a strong track record of successfully exploiting opportunities in the public financing system. For context, we gather secondary data from public resource providers (grant financing agencies), and professional grant proposal writers. Through a case study of four Norwegian start-ups that are on the extreme end of involvement in the public financing system, we will extract commonalities between successful grant proposal writers in how they work to maximise their chances of receiving grant financing. Our study gathers qualitative data from multiple sources, with primary contributions from written proposal documents and semi-structured interviews with key personnel in NTBFs with high degrees of involvement in the development of public grant proposals.

We connect our findings to a theoretical framework based on previous literature on legitimacy and information asymmetry across different NTBF life cycle stages. For policy-makers and grant administrators, our findings will point out strengths and weaknesses in different screening process and grant structures, as perceived by their applicant base. For grant applicants, our research offers a window into how grantees can work to build legitimacy and increase their competitive chances in grant tenders.

The thesis is structured in the following manner: First, we establish a theoretical frame of reference to describe how NTBFs attain and maintain legitimacy in the context of public grant applications. Second, we present a contextual frame of reference on a few different public grant financing programmes, with an overview of central grant agencies and programmes which are relevant for the remainder of this thesis. We then present our research methodology, before analysing and presenting the findings from our research. Finally, we discuss the implications of our findings for stakeholders in the public grant system and provide suggestions for further research.

Our research demonstrates how NTBFs build legitimacy in their grant proposals, and how they can exploit informational asymmetries in different parts of the public financing system to protect their applications from the scrutiny of expert evaluators. We point out several

concrete legitimacy-building devices that proposal writers use to build cognitive, regulatory and normative legitimacy, as well as establishing legitimacy through proximity to the grant programme or agency.

We contribute to extant literature in several ways: First, we connect literature streams on legitimacy and information asymmetry to the context of NTBF behaviour in public financing. This allows us to describe and demonstrate several important findings regarding how firms build and maintain legitimacy for their grant proposals. Second, we point out several mechanisms in the public financing system that can lead to adverse effects and opportunistic behaviour from grant applicants. Our research suggests that the firm-level perspective in public financing is a useful and largely unexplored avenue, and one that deserves further focus in future research into the designs and structuring of effective public financing schemes.

CHAPTER 2

THEORETICAL FRAME OF REFERENCE

The following section presents previous research into the dual purpose of the public financing system as both an instrument to bridge the so-called financing gap, and a public investment institution creating long-term value on behalf of the taxpayers. Next, we introduce the concept of different NTBF life-cycle stages, which we use to allocate firms and grant programmes into discrete stages of maturity. Next, the concepts of information asymmetry and legitimacy are introduced to explain how NTBFs source and maintain legitimacy in the context of public financing, and how conditions of informational asymmetries impact both the investor and investee in these situations. Finally, we combine these components into a proposed theoretical framework to answer our research question.

2.1. The Dual Purpose of Public Financing

Private risk-capital providers are typically deterred from investing in new technology-based firms because of the informational asymmetries (Akerlof, 1970) and high degrees of uncertainty that surround them (Shane, 2004; Auerswald & Branscomb, 2003). This leads to a lack in supply of risk capital for early-stage technology ventures, which is commonly referred to as the “funding gap” or “financing gap”. Van Osnabrugge & Robinson (2000) defined the financing gap as:

The absence of small amounts of risk capital from institutional sources for companies at the seed, start-up and early-growth stages, which arises because the fixed costs of investment appraisal and monitoring make it uneconomic for venture capital funds to make small investments, and also because of the reluctance of banks to make unsecured lending.

Van Osnabrugge & Robinson (2000)

For NTBFs, the lack of availability of risk capital leads to difficulties in securing the necessary entrepreneurial resources to develop and commercialise their product, service or offerings. Failing to make it across the funding-gap through unsuccessful product development or the lack of market penetration leads to the demise of many young firms, leading some to refer to it as the “valley of death”, as illustrated in figure 2.1. (Auerswald & Branscomb, 2003).

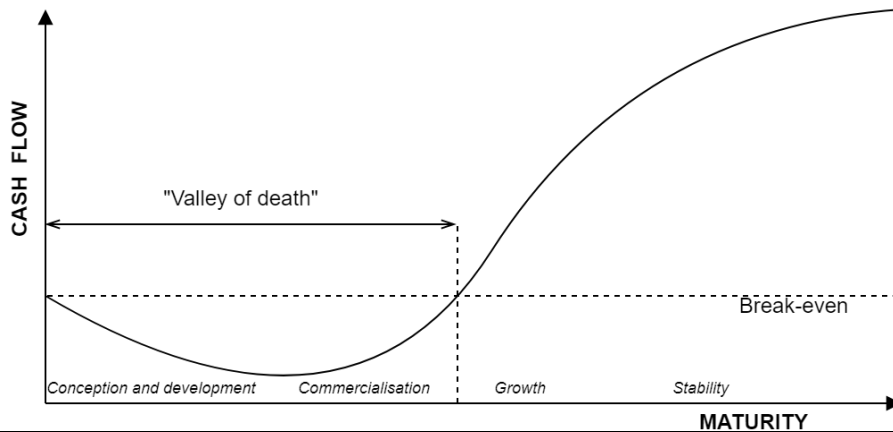


Figure 2.1: The “valley of death”
The typical interpretation of the “valley of death” as the negative cash-flow period between product development and market entrance. adapted from Auerswald & Branscomb (2003)

A central rationale for public financing schemes is to bridge the “valley of death” by providing early-stage capital for NTBFs to aid young and experimental firms in surviving past their initial research and development activities and reaching their markets with their new products or services. Figure 2.2. illustrates the different capital sources available for NTBFs depending on where they are in their life cycle, highlighting the lack of options due to the level of investment risk assumed by investors in early stages.

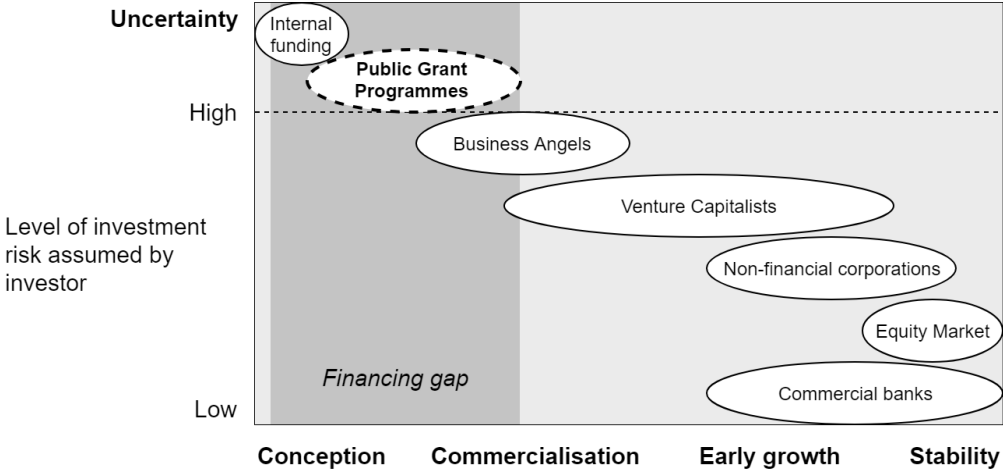


Figure 2.2: Capital sources in different NTBF lifecycle stages.
(Authors, adapted from Widding, Mathisen & Madsen, 2009; originally adapted from Van Osnabrugge & Robinson, 2000)

Bridging the funding gap is not the only purpose of public financing programs. Lerner (2002) argued that public financing schemes, although organized and administered in a variety of ways, all seem to share two central assumptions:

- i.) That the private sector provides insufficient capital to the new firms.
- ii.) That the government either can identify investments which will ultimately yield high social and/or private returns or encourage financial intermediaries to do so.

J. Lerner (2002)

We recognize Lerner's (2002) first assumption as the aforementioned "funding gap" hypothesis. The second assumption can be recognized as addressing the economic and social balancing of public financing, i.e. hypothesising that investments in public financing schemes lead to positive financial or social returns. Silva & Carreira (2017) expressed similar assumptions, dubbing them "*The financial market failure thesis*" and "*The social good thesis*". In the following sections, we scrutinise each of these assumptions more closely by reviewing pre-existing literature streams under both topics.

2.1.1. Public Financing as a Bridge Across the Funding Gap

In order to review the capacity of public financing programs to bridge the funding gap, one must first take a closer look at the assumption that such a gap exists in the first place. Believers in the effectiveness of free market forces will likely be sceptical of this assumption, seeing as risk capital providers in principal should recognize and meet this apparent demand for high-risk capital with a correspondingly adjusted (higher) rate of return to account for the added risk they take on (Hubbard, 1998; Stiglitz & Weiss, 1981). However, there are numerous indications in extant literature that the reaction of the capital market cannot be as simple as “higher risk, higher reward”, namely: 1) the presence of informational asymmetries, 2) adverse selection effects of increasing interest rates, and 3) the high levels of uncertainty surrounding new technology-based ventures.

Large information asymmetries (Akerlof, 1970) that exist between risk capital providers and potential investees make it difficult for banks to discriminate among borrowers (Lerner, 2002) since entrepreneurs and inventors possess more information about their venture’s potential value and probability of success than investors do. Furthermore, entrepreneurs are incentivised to withhold this information from outsiders, since their innovative ideas are vulnerable to imitations and spillovers (Hall & Lerner, 2010) once revealed. The result is that risk capital providers face a problem, where an accurate assessment of a firm’s value will only become apparent after the investment is made and investors gain access to the remaining information about the investee. Informational asymmetries in the context of entrepreneurial financing therefore plays an important role in reducing the ability of institutional investors to accurately discriminate between good and bad investment opportunities and adjusting their investment terms accordingly.

Interestingly, although raising interest rates on conventional debt financing options seem like a natural solution to adjust for the added risk and uncertainty surrounding NTBFs, raising interest rates past a certain point may in fact be less profitable for lenders. Stiglitz & Weiss (1981) demonstrated that increased interest rates past a certain point can lead to adverse selection effects which may ultimately lower the bank’s profits by 1) attracting lower-quality (riskier) borrowers, and 2) leading to changes in borrower behaviours with changing contract terms. That is, raising interest rates reduces the pool of applicants to those that are willing to accept higher interest payments, and decreases the borrower’s potential return upon successful project completion, incentivising firms to undertake projects with lower probability of success, but higher payoffs when successful. The relationship between the interest rates and the expected return is shown in figure 2.3. Stiglitz and Weiss’ findings from the debt market have since also been applied to equity markets (Myers & Majluf, 1984), showing that similar implications are valid for equity market decisions.

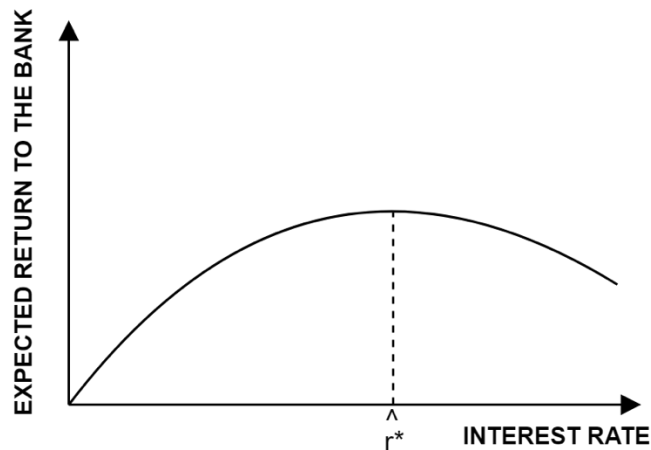


Figure 2.3: The relation between interest rates and expected return

There exists an interest rate (r^) which maximises the expected return to the bank
(Adapted from Stiglitz & Weiss, 1981)*

These mechanisms therefore limit the usefulness of interest rate adjustments as a risk mitigation tool for banks and other conventional investment institutions in the context of NTBF financing, lending some theoretical support to the thesis of a financial market failure, and, in extension, the existence of a funding gap.

At this point, it is natural to specify that the values of the knowledge and technological resources possessed by NTBFs are largely associated with high degrees of *uncertainty* (Rasmussen et al., 2007) rather than *risk*. In the classical Knightian (Knight, 1921) interpretation, risk and uncertainty are two different concepts: Whereas risk can be calculated as a known number of possible outcomes, each with a quantifiable probability, the outcomes of uncertainty are unknown and their probabilities, in turn, incalculable. We therefore distinguish between risk and uncertainty, knowing that risks, compared to uncertainties, can be more accurately discounted for and mitigated by adjustments in investment terms and conditions.

There are multiple types of uncertainty surrounding a new technology-based venture (Mathisen, 2017). Research- or technology-intensive firms typically are associated with high degrees of *technological uncertainty*, which concerns the feasibility of the novel technology to function as intended in operational environments (Jensen & Thursby, 2001; Shane, 2004). Another form of uncertainty pertains to the new firm's ability to penetrate the market with their novel product or service: *Market uncertainty* arises when it is unclear which commercial application is most feasible or attractive for the technology (Gruber, MacMillan & Thompson,

2013; Lubik & Garnsey, 2016), something NTBFs are typically vulnerable to if their products or services have multiple commercial applications. It is this accumulated high degree of uncertainty, both on the technical and market-side of NTBFs that contribute to the hesitance of conventional risk capital providers to invest, lending further support to the proposed existence of a funding gap.

Literature streams covering the economic theory regarding capital constraints similarly seem to lean towards a consensus that funding gaps exist (Hubbard, 1998) and are particularly significant for small firms with high R&D expenditures (Hall, 1992; Hao & Jaffe, 1993; Himmelberg & Petersen, 1994). Hall (1992) surveyed U.S. manufacturing firms and found that firm R&D investments were hampered by liquidity constraints. Hao & Jaffe (1992) and Himmelberg & Petersens (1994) similarly found that firm cash flow and liquidity levels positively correlate with (and predict) firm R&D investments. They argued that firms acting on R&D opportunities after positive shocks in cash flow or liquidity is an indication that these firms are constrained in their financing of R&D activities, as newfound profits could otherwise have been used on internal (non-R&D) investments or dividend payments, but are rather used to act on opportunities to innovate. More recently, (and perhaps more straightforwardly), Silva & Carreira (2017) found, in a survey of over 3,000 Portuguese firms, that nearly half of all surveyed firms (44%) reported financial constraints as limiting their R&D activities. Mohnen, Palm, Van der Loeff & Tiwari (2008) found similar results surveying innovative firms from the Netherlands, where about one in three (1221 out of 3456) surveyed firms reported being financially constrained and that these financial constraints significantly hampered their innovation activities. Other national-level studies (Savignac, 2008 (France); Mueller & Zimmermann, 2009 (Germany); Bougheas, Görg & Strobl, E, 2013 (Ireland); Bond, Harhoff & Van Reenen., 2003 (United Kingdom)) further support a general consensus that financial restrictions exist among NTBFs, and that these restrictions hinder NTBFs' research and development activities, lending further support to the existence of a funding gap among NTBFs.

Following the conclusion from the previous paragraphs that NTBFs commonly are financially constrained from performing R&D activities, the next question is whether or not public financing is effective in alleviating these constraints. In this literature stream, the evidence is more ambiguous. Silva & Carreira, 2017, who reported the staggering 44% of surveyed Portuguese firms being financially constrained, interestingly also found that firms in financial distress were *not* more likely to recover from this distress after receiving public economic aid. In fact, they found the opposite: firms receiving public aid in some cases reported being *more* financially constrained in later follow-up surveys:

“(…) the results described in this paper suggest that, if the provision of public funding for R&D purposes has any effect upon the firm’s financial constraints, this effect is positive - i.e. subsidies further amplify financial constraints.

Silva & Carreira, 2017

Although Silva & Carreira (2017) propose a few intuitions as to why public aid does not seem to alleviate financial constraints (e.g. publicly funded R&D activities leading firms to discover additional possibilities for further R&D which they are then financially constrained from pursuing), these results are puzzling and without a definitive empirical answer in extant research.

Setting aside the findings of Silva & Carreira (2017), several key points are raised in the literature to support the role of government agencies filling the funding gap. Importantly, Knockaert, Claryse & Wright (2010) found that government-funded financiers are more willing to invest in early-stage university spin-off companies (an important subset of NTBFs) than purely private VCs. Similar results of public funding programmes taking on earlier-stage projects than private investment institutions have been found by other researchers (e.g. Cumming, 2007), providing some support that government financing agencies fulfil their stated purpose of correcting the failures of the capital market to invest in high-uncertainty, early-stage ventures.

Lerner (2002) further observed that government funding agencies can counteract an observed *herding* mentality (Devenow & Welch, 1996) among private investment institutions, which is occurs when VCs and other institutional investors converge towards certain industries or markets at a given point in time. Firms that are not in these trending industries, and therefore struggle to get attention from institutional investors, should still have equal chances in acquiring public grant financing. Indeed, government programmes can even facilitate for growth in specific industries they want to focus on. As an example, the Research Council of Norway possess numerous industry-specific public funding programmes, such as MAROFF, a group of programmes directed at innovations in the maritime and offshore industries, and HELSEVEL, a similar programme dedicated to aid the emergence of innovations in healthcare and medical technologies. This way, government funding contributes to the diversity of the nations or region’s accumulated pool of funded ventures.

To summarise, extant literature on the purpose and function of public financing as a mitigating instrument for the funding gap has been divided into two main streams, measuring the degree to which firms are financially constrained, and measuring to which degree public funding is effective in alleviating these constraints. The first body of research generally supports the notions that 1) small and innovative firms are financially constrained, and 2) these financial

constraints hamper R&D activity, leading to the conclusion that NTBFs do, in fact, experience a funding gap. The second body of literature is less conclusive, with differing claims regarding whether or not public funding is effective in rescuing small and innovative firms that are stuck in the perceived funding gap. Some research has pointed out that public economic aid does not alleviate financial constraints for NTBFs, while other studies have suggested that publically funded venture capital fulfils its mandate of “bridging” the perceived funding gap by 1) taking on earlier-stage projects with higher degrees of uncertainty, 2) catalysing co-investments or later-stage investments from other financial intermediaries, like private business angels or VCs, and 3) increasing the diversity of surviving firms by counteracting “herding” mentalities displayed by conventional financial institutions.

2.1.2. Public Financing as an Investment Instrument

Although public funds from innovation grants are not usually tied to conventional financial instruments of collateral, such as interest rates or equity stakes in the grantee firms, the long-term goal for public financing programs is still to generate economic growth from a societal point-of-view: By providing the necessary financial aid for NTBFs to overcome initial challenges and mature into established businesses, the principal grant sum invested by the public financing agency is eventually repaid through the establishment of new tax-paying jobs and other tax revenues from the grantee firm’s economic activities and the extended economic activities of its employees, suppliers, and customers.

Following this economic logic, public grant programs can be viewed as investment schemes on behalf of the public, and grant applicants can be viewed as potential investment opportunities. As with any investment scheme, for the public funding programmes to be economically sustainable, the costs of “bad investments” (grants given to NTBFs that never materialize or fail to survive past a point of “tax break-even”), must be balanced out by “good investments” (grants given to NTBFs that go on to generate more value back into the economy than they received in grant financing). What both private and public financiers have in common, therefore, is an incentive to find efficient methods and processes to screen potential investment opportunities and identify those with the highest potential for success.

On this note, it should be mentioned that the measure of “success” can differ between private and public institutions: Whereas private institutions chiefly measure success by the financial gains of their portfolio, public agencies may have a broader view of what constitutes success, such as bridging academia and industry, facilitating for international cooperation, increasing regional absorptive capacity, or generating purely social gains like enhancements in quality-of-

life (like new medical technologies) or the environment (like advancements in pollution control).

In understanding the role of public financing schemes as investment institutions, it is helpful to understand the similarities and differences in their selection and screening criteria compared to private investment institutions. Several studies have compared the screening and selection processes between public and private financiers. Guild & Bachher (1996) examined differences in selection criteria across 60 business angels, private VCs and public VCs, and found very similar weighting among all financiers on five categories: 1) characteristics of the entrepreneurial team, 2) characteristics of the venture’s target market, 3) characteristics of the venture’s offering(s), 4) the investor’s requirements and 5) characteristics of the venture’s investment terms. More specifically, they found that the selection criteria were as illustrated in figure 2.4.

	Business Angels	Public VCs	Private VCs
Most important	Venture's Entrepreneurial Team	Venture's Entrepreneurial Team	Venture's Entrepreneurial Team
	Venture's Offerings	Venture's Target Market	Venture's Target Market
	Venture's Target Market	Venture's Offerings	Venture's Offerings
	Investor's requirements	Investor's requirements	Investment Terms
Least important	Investment Terms	Investment Terms	Investor's requirements

Figure 2.4: Differences in investment criteria among different investors

(Authors, adapted from Guild & Bachher, 1996)

As figure 2.4. illustrates, both the private and public VCs showcases a similar list of priorities, understating the fact that public VC, in fact, assess public grant applications in the same way a Private VC would assess a funding scheme. Continuing this logic, other studies have compared the *performance* of firms backed by public and private investment institutions. Cumming, Grilli & Murtinu (2017) found that firms backed by independent (private) venture capital (IVC) performed better and had a higher probability of a successful exit (either through a trade sale or an IPO) compared to firms backed by government venture capital (GVC). These results are consistent with similar studies, like Dvoulety (2017), who analyzed the performance of portfolio firms of a Czech public funding scheme, and found that firms backed with public funding, in fact, reported lower sales and lower returns on assets compared to a control group.

Lerner (2002) argued that even professional financial institutions like VCs struggle to pick winners, despite having stronger investment terms and more well-established processes for due-diligence, screening and monitoring of their investment decisions compared to public

financing agencies. The more lenient investment criteria and monitoring processes used by public financing institutions are therefore potential contributing factors to the on-average lower portfolio performance of GVC-backed firms.

Young high-technology firms are often characterized by considerable uncertainty and informational asymmetries. Why one would want to encourage public officials instead of specialized financial intermediaries as a source of capital in this setting is not immediately obvious.

Lerner, 2002

However, even taking the aforementioned critique of public financing programmes into account, there is still something to be said for the role of government in early-stage financing for NTBFs: Interestingly, Cumming et al. 2017 study comparing GVC- and IVC-backed firm performance also showed that syndicated venture capital, combining both IVC and GVC, had an even greater positive impact on firm performance and likelihood of a positive exit than IVC-backing alone. This was argued to be caused by several factors: First, the superior control and monitoring processes of IVCs mitigate the corresponding shortfalls of GVCs in these areas. Second, the syndicated VC as a group offers the investee an overall broader range of expertise, with access to both the IVC's and GVC's networks. Third, diversity in syndication enables diversification and risk sharing, and incentivises syndicated investors to collude to overstate the quality of the entrepreneurial firm in future financing events. In short, syndicated venture capital comprising both public and private investment institutions may represent a "best of both worlds" solution, where the characteristics and expertise of each venture capital agency are complimentary.

Lerner (2002) also argued for other possible benefits with public funding, namely the *certification hypothesis* and *technological spillovers*. The certification hypothesis suggests that government awards and grants may have a signalling (Spence, 1973) effect, qualifying (or "certifying") the entrepreneurial firm towards other investors and institutions. Public officials often have access to specialised expertise, e.g. from specialised branches of government, which may provide better insight into the quality of a new technology than traditional financial measures used by IVCs. As an example, a specialist from a government's department of health may be uniquely qualified to assess the quality of a new biotechnology firm. Lerner (2002) further argues that access to such specialised expertise is likely to be especially valuable in technology-intensive industries where traditional financial measures are less useful.

A second rationale for the benefit of public financing is the existence of technological spillovers (Lerner, 2002). These spillovers occur in a variety of forms (Griliches, 1992; Jaffe, 1998): Public financing and subsidies for R&D expenditures may generate positive externalities that benefit other firms or society as a whole, such as new production processes or open-source software solutions. Furthermore, R&D results may spill over from

entrepreneurial firms to their competitors, who then more rapidly produce imitations or complementary products, which ultimately benefits the consumers by reaching the market earlier. While this type of R&D spillover is bad news for the entrepreneurial firm, which loses its grip on its intellectual property rights (IPR), it also benefits society as a whole. The logic behind patents is based on a similar premise, where inventions eventually spill over into the public domain and benefit society as a whole. Importantly, spillovers can therefore contribute to societal gains and creation of social goods, even if these benefits come at the cost of portfolio performance. Many researchers point out that the extended social gains from publicly funded firms are significant and may even be larger than their private returns, even though they are harder to measure (e.g. Griliches, 1992; Hall, 1996; Silva & Carreira, 2017).

Finally, two additional factors further cloud the view around the economic profitability of public investment schemes: First, although many public financing institutions and programs make an effort to record and gather data on the performance of their portfolio firms, the metrics by which they measure these performances are insufficient, or adhere to differing standards and definitions, which make them unfit for comparison across different geographies, agencies and programmes (Spilling et al., 2015; Rasmussen & Sørheim, 2012; Auerwald & Branscomb, 2003). Second, the means by which the investments in the public financing system are returned to society are highly complex and challenging to measure. That is, while direct financial ROI of a conventional private VC portfolio may be relatively simple to monitor, it is harder to measure precisely how and to what degree a government grant trickles back into the economy. Even harder is to measure the additionality of the grant itself, i.e. the share of the firm's output that would not have occurred without the government support (Rasmussen & Sørheim, 2012). The aforementioned spillover effects of knowledge (Lerner, 2002) further contributes to the difficulty of measuring the overall economic and social return of public aid, since knowledge generated by (publically funded) R&D activities may generate social or economic goods that are only partially appropriated by the innovating party (Silva & Carreira, 2017).

In summary, the literature on public funding as an investment institution promoting economic growth for society is ambiguous and controversial, since the direct economic and social value generated by grant funds are difficult to measure, and even more difficult to compare across different programmes, agencies and geographies. Nonetheless, there seems to exist some degree of consensus that governments should have a role to play in the financing of early-stage technology companies (Spilling et al., 2015; Lerner, 2009), especially considering that the social returns of public investments in R&D can be higher, albeit harder to measure, than the private returns (Griliches, 1992; Hall, 1996; Silva & Carreira, 2017).

As we have seen, extant literature has attempted to analyse the economic profitability and effectiveness in correcting failures in the risk capital market, with limited results. Most literature has seemingly focused on studying public funding from a programme- or portfolio perspective, with little in-depth firm-level research on the detailed entrepreneurial activities of participant firms, leaving an important gap in literature where grantee activities are treated as a “black box”, with limited data on input (capital invested, screening data) and output (portfolio or firm-level success measurements) as known factors. We choose, therefore, to focus our research on the expressed need for research (e.g. Rasmussen & Sørheim, 2012; Fisher et al., 2016) into how NTBFs approach and exploit opportunities in the public financing system, by exploring how the public financing system is perceived and approached from the grant applicant’s side of the table, and studying the entrepreneurial activities that allow NTBFs to capitalise on public funding opportunities. The purpose of this research is to provide new insights into how public funding programs can be designed to more effectively serve their functions as both public investment institutions and providers of bridging capital across the perceived funding gap, thus improving the effectiveness of the public financing system for both NTBFs and grant agencies.

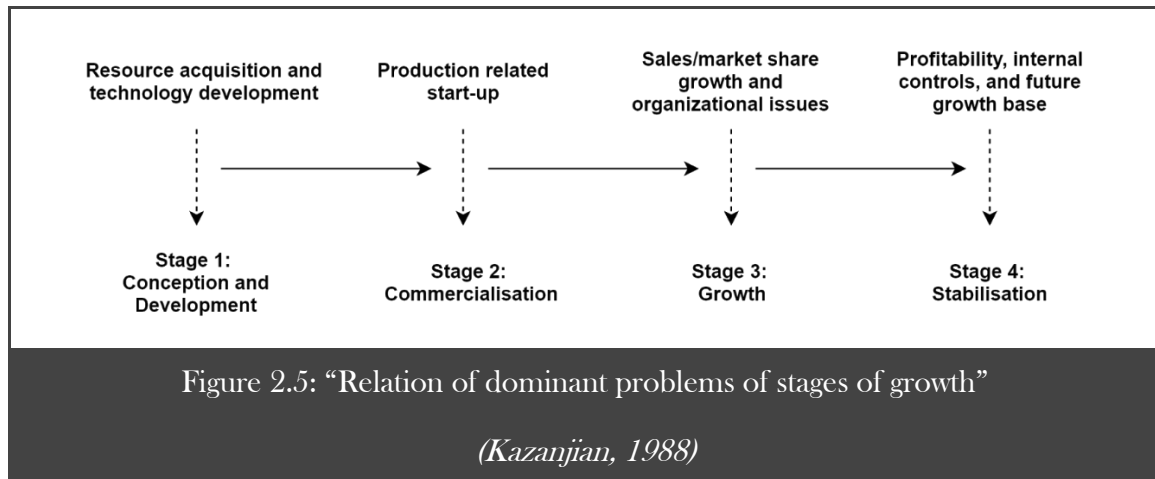
2.2 The life-cycle of a New Technology-based Firm

The literature streams within firm life-cycles are rich, and there are many models available which may have broader or narrower ranges, but for this study, we adopt Kazanjian's (1988) proposed four-staged life cycle model as our framework for discretising and allocating programmes and firms into life-cycle stages. Kazanjian pointed out that even though previous research (Miller & Friesen, 1984; Rhenman, 1973) and grounded case examples like Kimberly (1979) generally support his model, it is not universally generalizable. Both Penrose (1952) and Rhenman (1973) argued that there is no life cycle or phased sequence of events applicable to all organisations and that any observable recurring cycles or patterns in an organisation are products of that organisation's specific environment. However, Vohora, Wright & Lockett’s 2004 description of the critical junctures arising when a USO transitions from one phase to another further solidifies the notion that there are in fact recurring cycles. These recurring cycles contain certain phases which are sufficiently distinguishable to generalise some typical characteristics of the organisations within them.

The consensus of the literature presented above is that Kazanjian's model is applicable in distinguishing firms from one phase to another based on their characteristics. Kazanjian's four criteria for his model to be valid were: 1) that it is only to be used to describe new technology-based firms, 2) that the model only explains internally generated growth, and does not account for growth by acquisitions or mergers, 3) that for its focal population of firms, a market segment or niche exists such that demand and condition are not limiting, and 4) the

population's focus is on the initial growth within a single product-technology base. Our researched firms fit well with these criteria, which is why we will adopt this model for our thesis.

The four life-cycle stages in Kazanjian's model are 1) conception and development, 2) commercialisation, 3) growth and 4) stability. These stages are illustrated in figure 2.5.



In the conception and development phase, NTBFs face issues relating to identifying and accessing necessary entrepreneurial resources, including financing. Structure and formalities are typically non-existent, and most of the entrepreneur’s focus is directed at technical development activities for validating their new technology, such as constructing prototypes, performing laboratory testing or hiring engineering support. Once the technology is sufficiently validated, the company moves onwards to the commercialisation stage.

In the commercialization stage, firms shift their focus towards product and production development in order to transition from a proof-of-concept or prototype to a marketable product. Organizationally, the entrepreneurial team is likely to have hired additional employees, and systems for task management and other structural formalities are introduced. Towards the end of the commercialization stage, the firm’s product is introduced to the marketplace, ready for sale.

If the product can penetrate the market, a period of growth follows the commercialization stage as the firm’s third life cycle stage. The typical problems for firms in the growth stage are related to scaling up production, distribution, and sales of their new product. The firm typically experiences *“an almost constant state of change”* (Kazanjian, 1988) in the growth stage. More refined structures and task systems get integrated, and the firm’s management experience an increased focus on profitability and accountability for the firm’s shareholders.

Finally, as the venture evolves from a technology-product development group into an operating company, the firm enters its final life cycle stage: Stabilisation. At this point, its main problems relate to maintaining and increasing market share and growth momentum. Second- and third generation products get developed, and professional managers typically replace the founding entrepreneurs if this has not already happened. Organizationally, the firm is now characterised by formal structures and bureaucratic decision processes.

As the venture proceeds towards a new stage of its lifecycle, it faces different expectations from its interfaces with new and changing audiences. Conforming to this multitude of expectations and standards of different audiences is known as *institutional pluralism* (Fischer et al. 2016). Please see figure 2.6 illustrating the different thresholds associated with each of the phases mentioned above.

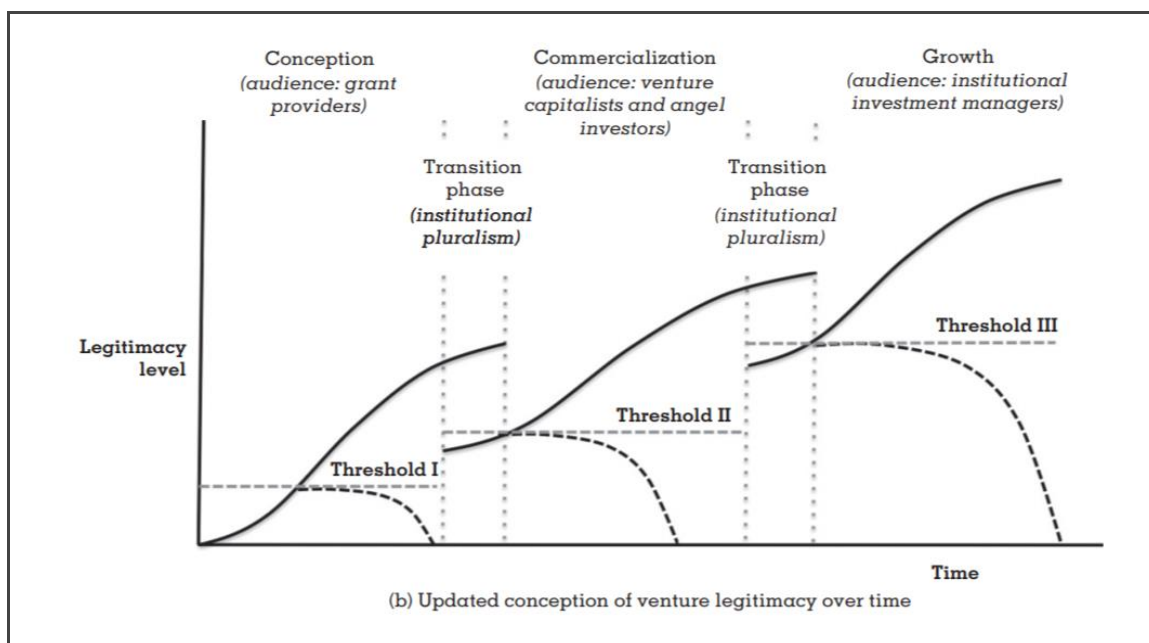


Figure 2.6: Legitimacy threshold & Institutional pluralism

(Adapted from Fischer et al, 2016)

With each transitional phase along the NTBFs life cycle, there are new thresholds of to reach in order to be perceived as legitimate, and according to Fischer et al. (2016), each new audience has different evaluation factors which together constitute a legitimacy threshold. As a fitting example to our topic at hand, Fischer et al. (2016) describe early-stage grant providers as an ideal audience for firms in the conception and development stage. As we will show, there are also grant agencies and programmes targeting firms in the commercialisation stages as well, and the model used by Fischer et al. (2016) demonstrates that such audiences will have a higher legitimacy threshold than earlier-stage grant providers. In other words, later-stage grant

providers can be expected to more closely scrutinise and critique the claims made by their applicants compared to grant programmes targeting earlier-stage firms. In line with Fischer et al.'s (2016) proposed model of multiple legitimacy thresholds and Kazanjian's work on NTBF lifecycle phases, this thesis concern itself with how NTBFs in the earliest stages of conception, development and commercialisation overcome their liabilities of newness and smallness (Stinchcombe, 1965) by building legitimacy. In his work, Stinchcombe pointed out three central elements to what he believed could be the reasons for the high failure-rates amongst nascent organisations: 1) New organisations acting in new areas ask for new roles to be performed by their members. The learning associated with fulfilling these new roles takes time and leads to economic inefficiencies. 2) Employees in the new firm do not know each other, leading to a lack of trust amongst employees. 3) The new organisations have yet to build a solid portfolio of clients.

For an NTBF, overcoming these obstacles becomes an exercise in building and maintaining sufficient legitimacy to reach the threshold of different audiences. In our context, this means building and maintaining legitimacy for their grant proposals with the grant agencies' appointed expert evaluators as audiences. Drawing from Fischer et al. (2016) framework, nine evaluation factors on which NTBFs' legitimacy is commonly judged in the conception and development and commercialisation are derived and listed in Table 2.1. These are the nine main criteria audiences use to evaluate NTBFs throughout the conception and commercialisation stages, and commonly manifest themselves through the written proposal templates used in the screening process for public grant competitions.

Table 2.1: Evaluation factors for audiences in the conception and commercialisation stages

Technological Plausibility

Technological plausibility refers to the perception that the technological challenges associated with the project will get successfully resolved. What is the chance of the NTBFs technology not working? Such an assessment often gets based on the project's "scientific relevance and scientific merit" (Fisher et al., 2016; Maurer & Ebers, 2006), which, in turn, stems from the audience's perception of current technological paradigms and proposed technical trajectories needed to achieve desired outcomes (Dosi, 1982).

The Reputation of the Team

What academic track record does the team possess? Do any of the team members have a reputation of excellence in relevant areas needed for the NTBF to succeed? As mentioned, the assessment criteria of both private and public financiers typically put heavy emphasis on the entrepreneurial team's track record and experience (Guild & Bachher, 1996) in their assessment of the quality of potential investees.

Recognition of Associated Institution

Affiliation with a high-status institution signals quality and provides a sense of familiarity that promotes legitimacy (Fischer et al., 2016). Legitimacy is often sourced using the entrepreneurs' network (Aldrich and Fiol, 1994), and if NTBFs can gain endorsements from relevant industrial or academic third-parties, this generates credibility as the legitimacy of the endorsing party spills over into the endorsed (Stinchcombe, 1965).

Creation of Public Goods

Creation of social goods is seen as a legitimacy-building feature. As mentioned previously, the creation of public goods is a central mandate for public financing, and so this point is especially relevant in the context of our research. Central assessments under this topic can be along the lines of "What are the non-economic benefits of releasing this project?" or "How does this idea contribute to bettering 'X' (e.g. quality of life, national security, climate change, healthcare)?"

Advancements in Knowledge and Societal Gain

How does the idea provide advancement in knowledge and societal gain? As mentioned, it is hard to measure the overall societal ROI from investments in grant financing for NTBFs (Spilling et al., 2015; Rasmussen & Sørheim, 2012; Auerswald & Branscomb, 2003) since they are far less tangible and more complex to measure than private gains, and because of the existence of technological spillovers (Lerner, 2002; Griliches, 1992; Jaffe, 1996).

Compliance with Norms and Standards

Towards research-oriented funding programmes, specific expectations of academic norms and standards influence how NTBFs are perceived as legitimate or not. Compliance with academic norms includes knowledge generation through openness and the advancement of societal goals (Fischer et al., 2016). Compliance with norms or standards can also include industry-specific norms and standards, regulatory requirements, certification or adherence to relevant legislation.

Compliance with legal requirements for private entities

The understanding of legal requirements and how these get dealt with says a lot about the level of maturity an NTBF possesses. A firm should adhere to short-term legal requirements such as registration activities, accounting, and insurance policies, while at the same time showing that they plan to align their strategy with long-term requirements such as national security policies and protection of private data.

Protection of private goods

How does the NTBF plan on protecting their idea? Do they have a strategy for protecting their idea from imitations or other exploitations from outsiders? The NTBFs' understanding of intellectual property rights (IPR) conveys two central elements of information for the evaluators: 1) The due diligence executed to ensure freedom to operate and potential patent-rights, and 2) the entrepreneurs' reasoning behind their strategic choices of direction for their firm. Both elements are central in building legitimacy. The first element speaks to the business case itself, and the latter speaks to the motivations and behavioural tendencies of the entrepreneurial team.

Perceived market potential

How big can this idea get, and how fast can it get there? In showcasing a realistic and well-founded logic for illustrating initial and total addressable market opportunities, entrepreneurs can build legitimacy for their idea's market potential. A large market opportunity and clear strategy to address it can give public financiers an indication of how large the economic returns can be from each case, and backing those assumptions up with well-founded, coherent arguments can help firms build legitimacy.

2.3 Legitimacy

Zimmerman & Zeitz (2002) defined legitimacy as a social judgment of acceptance that enables organizations to access the necessary resources to grow and argued that legitimacy is a resource in the same manner as capital, customer goodwill, and customers. For NTBFs, legitimacy provides a means to overcome the liability of newness and smallness (Stinchcombe, 1965). In their work, Zimmerman & Zeitz (2002) describe legitimacy as an intangible asset that only exists within the psyche of social actors, and explained the relationship between firm legitimacy and venture growth as two propositions:

Proposition 1a: The greater the level of the new venture's legitimacy, the more resources it can access.

Proposition 1b: The greater the amount of the new venture's resources, the more growth it can achieve.

Zimmermann & Zeitz (2002)

The logic dictates that proposition 1a leads to proposition 1b, and that legitimacy attainment, therefore, directly or indirectly, is a contributor towards firm growth. These suggestions are in line with previous findings of Shane & Delmar (2004) who looked at 223 new ventures over a 30-month period and found that undertaking legitimacy-building activities like writing business plans was linked to a reduced risk of the venture disbanding. Suchman (1995) claimed that legitimacy is a social construct and depends on a collective audience's systems of values and beliefs, and yet is independent for each observer, meaning that the criteria for evaluating legitimacy are prone to subjective interpretations. Suchman defined legitimacy as:

A generalized perception or assumption that the actions of an entity are desirable, proper, or appropriate within some socially constructed system of norms, values, beliefs, and definitions"

Suchman (1995)

Building and maintaining legitimacy is a complex task. It can be visualized as rolling a boulder up a steep hill: Pushing the boulder up demands much effort, and any progress you make is not permanent, but rather dynamic and requires effort to maintain: Letting go will make the boulder roll downwards again. Similarly, building legitimacy is a complex, costly, and demanding task, and, once gained, legitimacy is dynamic rather than static, and so requires continued effort to maintain. Staying with our metaphor, maintaining the boulder in one place demands some effort, , but not as much compared to moving it further uphill. Similarly, maintaining legitimacy demands continued effort and focus, albeit less so than gaining it (Suchman, 1995).

Jepperson (1991) described an organization's desire to be legitimate as a way of conveying what the organization is doing and why. In the context of public grant competitions, it is the expert evaluator's mandate to be critical and not hand out legitimacy without being adequately convinced. The perspective of legitimacy attainment in grant proposals turns into a tactical battle between the evaluator and the entrepreneur, where the entrepreneur must do their best to defend their claims from the scrutiny of the evaluator.

Entrepreneurial storytelling is another commonly described device for building legitimacy (Lounsbury & Glynn, 2001; Aldrich & Fiol, 1994; Garud, Schildt & Lant 2014; Wry, Lounsbury & Glynn, 2011). Entrepreneurial storytelling is used to communicate a story, as the researchers described:

A narrative subject such as an individual entrepreneur or NTBF explains the objective or goal of a narrative to end up as a successful new enterprise to potential stakeholders, and the destinator as the corporate and societal environment in which the narrative subject operates in, such as a grant-administrator, and for these stories to function effectively, the content of entrepreneurial stories must align with audience interests and normative beliefs to enable favorable interpretations of a new venture”

Fiol (1989); Lounsbury & Glynn (2001)

Considering the liabilities new ventures face of newness and smallness, entrepreneurial storytelling is a valuable source of legitimacy for NTBFs. Lacking in other strengths, an exciting and coherent narrative can contribute to conveying legitimacy for firms in their early stages. As put by Lounsbury & Glynn in their work on cultural entrepreneurship and legitimacy:

Entrepreneurial storytelling will have its most significant impact on enabling capital acquisition and wealth creation in the emergent or earliest stages of new venture formation, by making the unfamiliar new enterprise more familiar, understandable, acceptable, and thus more legitimate, to key constituencies.

Lounsbury & Glynn (2001)

2.4 Four Sources of Legitimacy

Previous research on legitimacy has argued that legitimacy can be obtained from three sources: *Regulatory legitimacy*, *normative legitimacy*, and *cognitive legitimacy* (Scott, 1995; Hunt & Aldrich, 1996; Palthe, 2014). Zimmerman & Zeitz (2002) identified a fourth source of legitimacy in addition to the abovementioned: *The industry itself*. As they argued, new technology-based firms can draw legitimacy from claiming membership in one or several industries. In our thesis, we extend this fourth source of legitimacy to a slightly broader term of *proximity*. Zimmermann & Zeitz (2002) argued that: “*New ventures can derive legitimacy from their industry, adding to the legitimacy they have from other sources.*” Proximal

legitimacy can be derived from the NTBFs claims of membership to certain industries when these are relevant for the grant programme. Furthermore, proximal legitimacy can be established by conveying closeness between the firm and the grant agency or programme's objectives, whether that refers to geographical proximity, industry proximity, or proximity to the underlying objectives and ethos of the individual grant agency or programme topic. In other words, building legitimacy through proximity is to adequately connect the firm to the grant agency and programme, and vice versa.

2.4.1 Regulatory Legitimacy

Regulatory legitimacy is sourced by conforming with the relevant policies and rules. NTBF source this type of legitimacy through demonstrating conformance to regulations, rules, standards, and expectations created by other, more powerful organizations (Zimmerman & Zeitz, 2002). 'Powerful organizations' can refer to international standards organizations, government agencies, grant administrators, tax authorities and industry-specific market actors that collectively influence the expectations of what constitutes regulatory legitimacy. The audience's attitude towards regulatory legitimacy is that it is something the entrepreneur *have* to have (Palthe, 2014).

2.4.2 Normative Legitimacy

Normative legitimacy is sourced from a perceived understanding of the work roles, habits, and norms of a specific industry. Examples of normative legitimacy factors include adhering to values such as treating employees fairly and adopting professional norms such as those pertaining to the personal behavior of the firm's members (Zimmerman & Zeitz, 2002). Normative legitimacy is closely connected with ethics, and the audience's attitude towards normative legitimacy is that it is something the entrepreneur *ought* to have, in order to present themselves as responsible characters with a sense of duty and moral obligation.

2.4.3 Cognitive Legitimacy

Cognitive legitimacy is the understanding of values, beliefs, and assumptions of the recipient (Palthe, 2014). Speaking to the subconscious character of the evaluating party, portraying alignments with the evaluating party increases cognitive legitimacy. The audience's attitude towards cognitive legitimacy is that it is something the entrepreneurs should *want* based on their social identity and personal desire. The more elusive of the classical three sources of legitimacy, cognitive legitimacy is sourced through fragments that act as indicators of the entrepreneurs' professionalism and understanding of "*the game and how it is played*" (Zimmerman & Zeitz, 2002).

2.4.4 Proximal Legitimacy

As alluded to previously, we propose that *proximity*, as an extension of Zimmerman & Zeitz (2002) notion that NTBFs can source legitimacy from their perceived closeness to a specific industry, builds legitimacy for firms by establishing a connection between the firm and the grant programme and agency, and vice versa. The dot-com bubble in the late 1990-ies and early 2000s is a perfect example of how firms can experience increased (and decreased) legitimacy through their connection to a specific industry, in line with Zimmermann & Zeitz' original proposition. Timing is, in other words, also a component in proximal legitimacy attainment. Moreover, the relationships and geographical closeness firms exhibit towards a specific industry, grant programme or grant agency is effective in building legitimacy. Several grant programmes have specific industries they target, meaning proximity in some instances is a necessity for an NTBF to be eligible for a grant competition. Further understating the importance of proximity is the fact that venture capitalists typically invest in ventures within a confined geographical or industrial proximity, limiting the options for any NTBF outside the VCs preferred scope.

2.4.5 Distinguishing the Sources of Legitimacy

The four sources of legitimacy are somewhat intertwined, and where one is found, fragments of another are usually present. However, there are features making them distinguishable from one another: Table 2.2 summarizes some central rudiments with each source of legitimacy and points out the differentiating aspects by examples of how each type of legitimacy may be sourced. The table is inspired by the work of Palthe (2014), Fischer et al. (2016) and Zimmerman & Zeitz (2002). This table serves as helping guide in our theoretical framework to aid distinguish the different sources of legitimacy.

Table 2.2: Summarized legitimacy-differentiators

Legitimacy	Central Rudiments	Example of source
Regulative	Policies and rules	Certifications
		Legal documents
		Information regarding regulations
Normative	Work roles, habits and norms	CRM plan
		Quote from end-user
		Value chain mapping
Cognitive	Values, beliefs and assumptions	Eye-catching illustrations
		Aesthetically pleasing documents
		Convincing narratives
Proximal	Location, time and relationship	Timing of project
		Alignment between firm and grant agency values
		Geographical closeness to industry epicentre

2.5 Legitimacy & the Role of Information Asymmetry

When the entrepreneur knows more about their venture than the audience does, the situation is characterised by information asymmetries (IA). IA is a form of uncertainty that arises when one party knows more than the other, which occurs in many economic situations such as negotiations, trade sales or contracting (Mathisen, 2017). Public grant application screening processes are also very much characterised by conditions of informational asymmetries: The proposal writer has the privilege of choosing what information about their firm to submit to the expert evaluators, while being constrained by the text limitations and other formal requirements put in place by the grant administrators. Except for publicly available information or correspondence through presentations or Q/A sessions, the evaluating panel does not have opportunities to source additional information from the firm past the contents of the application text and any publicly available information.

From the grant financier's standpoint, uncertainties arising from the existence of informational asymmetries heightens the risk of misplacing the public funds due to 1) not having enough information regarding the NTBF, and 2) not knowing if the information presented is derived from a legitimate source. At the early stages of venture creation, the entrepreneur rarely has perfect information about their own venture and the market of which it will operate, and this further increases the dynamics created by conditions of IA. In this way, informational asymmetries add an extra layer of uncertainty on top of any inherent technological or market uncertainties in the underlying firm.

There are several ways in which the original economic context of IA is transferable to our topic of public financing, and some ways in which it is not. When we use IA as a backdrop for our later analysis, we mostly make use of the impacts of conditions of IA on investment decisions, as grant applicants possess more information about their venture than the grant administrators and evaluators do, and are incentivised to withhold and manipulate information about their venture in order to be perceived more positively by their audience. A further similarity between the original context and the context of public financing is that public financiers, similarly to private investors, have no way of accurately assessing the value of their potential grantees until the grant has been awarded and they eventually gain access to more information about the grantee firm. However, as an important caveat to using this theory in our analysis, one important element is very different between Akerlof's (1970) original context for IA and our context of public grants: the lack of a price mechanism in public financing.

To elaborate on this conceptual difference, the concept of IA was first introduced in the 1970 paper *The Market for "Lemons": Quality Uncertainty and the Market Mechanism* (Akerlof, 1970) where the automobile market was used to exemplify how information asymmetry quality heterogeneity can lead to the disappearance of a market where guarantees are indefinite. In Akerlof's fictive market for used automobiles, good and bad cars are indistinguishable at face value, and the buyer has no way of knowing if they are buying a "peach" or a "lemon" due to asymmetric information. This puts downward pressure on the value of the car, as the buyer knows the seller has incentive to describe a car to be better than it actually is, so only average cars will be considered, effectively running all cars considered above average out of the market. A "lemons" market occurs when: 1) There are information asymmetries between buyer and seller, so one part has a better basis for assessing the value of a product or service than the other. 2) There exists an incentive to describe low quality product as a high-quality product. 3) The seller has no way of proving one product is better than the other. 4) Buyers place downward pressure on value. 5) There are no guarantees or quality assurances.

Using these five criteria in assessing the “market” that public funding agencies operate in, it becomes apparent that the example put forward by Akerlof is only partially transferable to the process of a grant-proposal, as the fourth condition is not fulfilled since there are no price mechanisms in public funding which may correct for conditions of informational asymmetry. However, the four other conditions transfer well to our context of public financing: The seller is the entrepreneur, and the buyer is the grant administrator. There exists a clear informational asymmetry because the entrepreneur knows more about their venture than the audience does, and the entrepreneur has an incentive to portray their NTBF favourably over the competing grant applicants.

There are two mechanisms which can be used to counteract conditions of informational asymmetries (Mathisen, 2017), and *screening* (Stiglitz, 1975) is the one we will consider first. Screening is used to evaluate applications prior to interactions with the other party. Stiglitz used wages as an example to describe the phenomenon:

A company can't know what value a new employee will add to their business prior to them working there, but by looking at certain aspects of what other workers did to create value they could derive some criteria of which a potential hire must align with.

Stiglitz (1975)

In our context, screening is used to evaluate written grant proposals according to a predetermined set of eligibility criteria and assessment criteria. Applications that do not fit the eligibility criteria are screened out. The remaining applications are scored according to the assessment criteria. These eligibility criteria and assessment criteria are known to both the grant evaluators and applicants in advance, and so an important aspect of screening in this context is that screening processes in grant funding schemes allow firms to act opportunistically by exploiting their knowledge of a given grant programme's assessment- and eligibility criteria when developing their application, putting the proposal writer in an advantageous position. The screening process therefore poses a way for firms to build legitimacy in their grant proposals, as it lets the entrepreneurs write their applications with the specific grant programme's assessment criteria in mind.

The second means of mitigating adverse effects of conditions of IA is *signalling* (Spence, 1973; Connelly, Certo, Ireland & Reutzel, 2011). As Connelly et al. (2011) illustrated:

When two parties have access to different information, typically, one party, the sender, must choose whether and how to communicate (or signal) that information, and the other party, the receiver, must choose how to interpret the signal.

Connelly et al. (2011)

Spence (1973) argued that the signalling theory is fundamentally concerned with reducing information-asymmetry. In our current socio-political environment, signalling is all around us. What education you have is a signal towards your employer, in the same way that a high-fashion clothing brand is a signal of taste or style. In our context of public financing, legitimacy and signalling can be seen as two sides of the same story, with one being more sender-oriented and the other being more receiver-oriented: The proposal writer uses legitimacy-building devices to signal informational cues to the receiver (the grant evaluator), and the evaluator interprets signals from the proposal text to judge the legitimacy of the applicant.

2.6 Proposed Theoretical Framework

Using the bodies of literature presented in this chapter, the theoretical framework used in this thesis is constructed in the following manner: The scope of research is set to cover NTBFs and grant programmes in the conception & development and commercialisation stages of an NTBF as described by Kazanjian’s (1988) four-stage life cycle model. To assess and code claims made in grant proposal writers’ applications, we use Fischer et al.’s (2016) comprehensive framework for assessing legitimacy in a venture’s conception and commercialization stages, as these themes are commonly covered in public grant proposal templates. We use Zimmermann & Zeitz’ (2012) four sources of legitimacy to distinguish between different sources and devices for building and maintaining legitimacy from the sender’s point-of-view and connect these concepts to the receiver-oriented devices for counteracting informational asymmetries, namely screening and signalling.

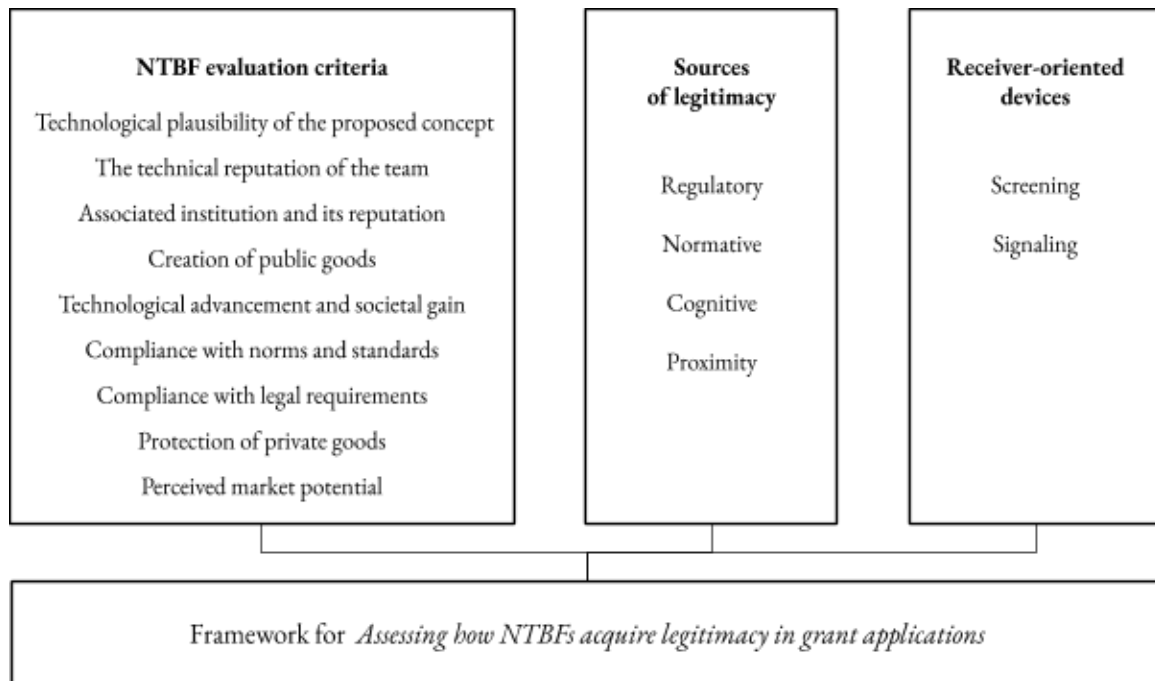


Figure 2.7: Illustration of the Theoretical Framework

The figure above illustrates how the theoretical framework is used to assess and answer how NTBFs acquire legitimacy in grant-applications. The box on the left shows the NTBF legitimacy evaluation criteria as adapted from Fischer et al. (2016). Statements related to these criteria are used to differentiate between different topics when assessing case documents. We use Zimmermann & Zeitz’ (2012) four sources of legitimacy to distinguish between different legitimacy-building devices from the grant applicant’s perspective, and countermeasures to conditions of informational asymmetries, namely screening and signalling, to describe the intended effects of these legitimacy-building devices on grant evaluators.

CHAPTER 3

CONTEXTUAL FRAME OF REFERENCE

In this chapter, an overview of selected Norwegian and EU-wide public financing programmes is presented. A nomenclature for describing the different structural elements and mechanisms that go into designing different grant programmes is presented. Using this nomenclature, we provide an overview of the most central regional, national and EU-based public financing programs relevant for our thesis. Public financing schemes are organized in a wide variety of ways (Lerner, 2002), and collectively compose a complex ecosystem of regional, national and international funding programmes and agencies. As an example, one survey identified 178 different government initiatives to promote commercialisation of university research in Canada alone (Gault & McDaniel, 2004). A complete overview of all public funding opportunities therefore falls outside the scope of this thesis. Instead, we will present a selection of funding agencies and programmes in the Norwegian regional and national level, as well as a few EU programmes on the international level. Our selection of programmes is based on what our research subjects highlighted as the most important for them and their ventures.

The Research Council of Norway

The Research Council of Norway (RCN) is a strategic entity of the Norwegian government which allocates research funds through numerous funding programmes. It is one of two main government agencies administering early-stage capital in Norway together with Innovation Norway. One of the RCN's main funding schemes is the FORNY programme, which is aimed at funding research-based innovations with a connection to research institutions or universities.

FORNY is in practice is an umbrella programme, with several different funding schemes organized under the FORNY banner. The most central programmes for this thesis under the RCN's administration are FORNY StudENT grants, and FORNY Verification grants.

Innovation Norway

Innovation Norway (IN) is the second branch of the Norwegian government's public financing initiative for early-stage companies. In a review of the Norwegian public financing system, Rasmussen et al. (2007) pointed out that IN, as opposed to RCN, has a comparatively shorter time horizon and a lesser focus on research in the projects they fund. Public aid from

Innovation Norway is awarded with a maximum aid intensity of 50-100% of total project costs, depending on the programme. The most important funding programmes for NTBFs under IN's administration are Pre-market Evaluation grants, Commercialisation grants, and Innovation Contracts.

Regional Research Funds (RFF)

Regional Research Funds (RFF) is a group of seven regional grant agencies administered by Norwegian municipalities. RFF is a regional extension of the national RCN, and through RFF, the Norwegian government facilitates for increased regional growth and innovation activity. In order to be eligible for grant financing from RFF, NTBFs must be registered inside the jurisdiction of their local RFF branch. Funding from RFF is given with a maximum funding intensity of 50%. The most central funding programmes administered by RFF are Qualification grants and Regional Enterprise grants, which in practise are organised as "Phase 1" and "Phase 2"-grants, respectively.

European Grant Agencies

Our research covers three central grant programmes under the administration of two central European financing agencies, The European Commission (EC) and Eureka!. The EC coordinates Horizon 2020, which is the European Union's framework programme for research and innovation running from 2014 to 2020. With a total budget of nearly €80 billion, H2020 is the world's largest multinational research financing programme (Publications Office of the European Union, 2014). One of its most competitive and attractive grant programmes under the H2020 umbrella is the SME Instrument, which is a two-phase grant program that is open for all innovative small and medium enterprises (SMEs). Phase 1 of the Instrument is a €50,000 grant for firms in the conception and development stage, while Phase 2 is a commercialisation grant with a maximum grant funding amount of \$2,5 million with a 70% funding intensity. Another popular grant programme in H2020 is the PES 2020 programme (Project Establishment Support), which awards NTBFs lump-sum grants of €5,000-€10,000 earmarked for development of application proposals towards funding competitions organised by the EC. PES-grants are funds which enable NTBFs to travel and connect with potential international partners or hire external consultants for help with the proposal writing process.

In addition to the EC's H2020 programmes, another major European innovation grant programme is Eurostars, which is co-administered by the European Commission and Eureka!, another European innovation coalition comprising 41 European nations. Eurostars is an open innovation grant where a requirement for all participant projects is, amongst others, that they include at least two partners from different EU member states. The grant is administered with a maximum funding intensity of 50% and the maximum grant limit is

dependent on the applicant’s home country (€600,000 for Norwegian participants). Table 3.1 summarises the central grant programmes relevant for the remainder of this thesis.

Table 3.1: Central grant programmes

Grant Programme	Grant Agency	Geography
FORNY StudENT	Research Council of Norway	National (Norway)
FORNY Verification	Research Council of Norway	National (Norway)
Premarket Evaluation Grant	Innovation Norway	National (Norway)
Commercialisation Grant	Innovation Norway	National (Norway)
Innovation Contract	Innovation Norway	National (Norway)
Qualification Grant	Regional Research Funds	Regional (Norway)
Regional Enterprise Grant	Regional Research Funds	Regional (Norway)
SME-Instrument Phase 1	European Commission	International (EU)
SME-Instrument Phase 2	European Commission	International (EU)
Eurostars	European Commission & Eureka!	International (EU)
PES 2020	European Commission	International (EU)
<p><i>The table lists the grant programmes that will be central to the remainder of our thesis according to grant programme, grant agency and geography. Here, ‘geography’ means the geographical scope or boundary of eligible target applicants for that programme.</i></p>		

Please note that the table above is far from exhaustive by any measure. We have only highlighted a few of the many funding agencies that are available for NTBFs, and the funding agencies we did highlight offer a range of other grant programmes in addition to the ones we have chosen. As mentioned, a complete overview of all options in the public financing system is outside of the scope or intention of this thesis, but our selection does, however, include a multitude of different grant structures, which have a big impact on how the grants are implemented in practice. Consequently, the way grants are structured also impacts how NTBFs perceive and approach them. Although it is impossible to capture all the idiosyncratic features of different grant programmes, as a starting point, in table 3.2 we are introducing five elements that contribute significantly to the overall structure of the grant programme: proposal

deliverance, screening process, target phase, maximum grant amount and maximum funding intensity.

Table 3.2: Structures of relevant grant programmes

Grant Programme	Proposal Deliverance	Screening Process	Target Phase(s)	Maximum Grant Amount	Maximum Funding Intensity
FORNY StudENT	10 pages	2-stage	Conception	€100,000	100%
FORNY Verification	10 pages	2-stage	Commercialisation	€500,000	100%
Premarket Evaluation Grant	5 pages	1-stage	Conception	€10,000	100%
Commercialisation Grant	10 pages	1-stage	Commercialisation	€60,000	50-75%
Innovation Contract	10 pages	1-stage	Commercialisation	No maximum	45%
Qualification Grant	5 pages	1-stage	Conception	€50,000	50%
Regional Enterprise Grant	10 pages	1-stage	Commercialisation	€150,000	50%
SME-Instrument Phase 1	10 pages	1-stage	Conception	€50,000	100%
SME-Instrument Phase 2	70 pages	2-stage	Commercialisation	€2,500,000	70%
Eurostars	70 pages	1-stage	Conception / Commercialisation	€600,000	50%
PES 2020	2 pages	1-stage	Conception	€10,000	100%

The ‘proposal deliverance’ is the maximum text amount allowed for the written project proposal. Different grant agencies almost always use their own, internal format for project proposals, which can either be a document-file template or an online form provided by the agency’s web-based applicant platform. For simplicity, we are approximating equivalent texts lengths in written A4 pages for programmes using online web forms.

With ‘Screening process’, we are talking about the processes grant agencies use to screen the pool of eligible applicants, which can either be single-staged or double-staged. Single-staged

screening means that the grant agency and their appointed expert evaluator panel make their decision based solely on their review of the applicant's written proposal text. Double-staged screening processes have an additional stage of screening after the initial selection of qualified written proposals. This second screening stage is usually in the form of a presentation or interview with representatives from the grant agency and their expert evaluators. With 'target phase', we mean the life-cycle stage of the NTBFs which the grant programme is designed to target. The 'maximum grant amount' is the upper limit of the total grant contribution to the proposed project, and the total grant amount as a fraction of the project's total eligible project costs is the 'Maximum funding intensity' (i.e. the inverse of the required self-financing).

CHAPTER 4

METHOD

The first section of this chapter describes the research design and methodology used to gather and analyse all data relevant to answering the research question at hand. The second section outlines the researchers' prior knowledge and the use of a semi-structured literature review to form the basis of our theoretical and contextual frame of reference. The third section describes the process of selecting cases, gathering, and analysing data. Lastly, the researchers review the reliability, validity, and limitations of our research methodology.

4.1 Research Design & Methodology

Yin (2014) defines research design as” *A logical plan for getting from here to there, where there may be defined as the initial set of questions to be answered, and there is some set of conclusions or answers about these questions*”, and Flick (2014), lists five guiding principles for research design in line with this statement:

- I. To clearly isolate causes and effects
- II. To properly operationalize theoretical relations
- III. To measure and quantify the phenomena
- IV. To create research designs allowing the generalization of findings
- V. To formulate general laws

Following these statements and guidelines, the research methodology was designed to help the researchers understand the human mechanisms at play when an entrepreneur is posed with the option to adjust information dependent on a target audience. A comparative study investigating the funding strategies from four NTBFs was used to analyse the similarities between each application alongside the secondary input from a professional grants writer and a representative from a grant agency with experience as an expert evaluator. This qualitative input was gathered through 1) a thorough examination of grant-applications the NTBF had submitted, 2) semi-structured interviews with the application writers, and 3) semi-structured interviews with professional grant writers where the topics discussed in the interviews with application writers was further explored.

Thoroughly investigating the secondary data in the form of written applications alongside the data gathered through semi-structured interviews were done to provide insight into the

thought-process that went into each statement in the written applications. Combining these sources of data was done to identify whether or not, and to what degree, the start-ups adapted their narrative and varied the inclusion of information between the different applications depending on the funding program's stated purpose, criteria, and target audience (evaluators). A deep-dive into the contextual and theoretical frame of reference was conducted to limit the scope of research and specify the dynamics at play throughout the writing process. The semi-structured literature review was conducted to accurately describe the theoretical phenomenon included when developing the proposed theoretical framework. As with all studies, minor adjustments have been made to fit the overall format of the thesis. In essence, the literature review was used to set a theoretical foundation and framework for the thesis by identifying gaps in the literature.

The research was conducted using qualitative data to explain and develop a theory regarding the research question, through in-depth information from a limited number of sources, rather than shallow data gathered from many. According to Flick (2014), qualitative methods are appropriate when exploring discoveries and phenomena. This research method is therefore well suited to study the effects of legitimacy under conditions of information asymmetry in the context of public funding programs, as this has not been described in pre-existing literature to our knowledge. Yin (2014), states that case studies are a good option when the research tries to answer questions of *how* and *why*, which is well aligned with the scope of our thesis. To generate a holistic set of data, the researchers choose to use a case-study methodology with a grounded theory analysis (Glaser & Strauss, 1967; Charmaz, 2014; Creswell, 2007).

Grounded theory is very well suited when the unit of analysis and focus is concerned with studying a process and developing a theory in the views of the participants (Creswell, 2007), which is the focus when exploring our research question: "*How do new technology-based firms maximize their chances of success in the public grant system?*" The reasoning for choosing this method is further supported by the fact that the study is inductive, where the process in a specific context is explored to detect patterns and regularities to develop a theory and make general conclusions.

4.2 The Authors' Prior Knowledge

The researchers had prior knowledge relevant to this field in two ways: Both had personal experience as entrepreneurs working in NTBFs and had written grant-applications. Although one researcher had significantly more experience in this domain than the other, both were familiar with the financial instruments described in this thesis' contextual frame of reference. The second piece of prior knowledge came through a preparatory body of work for this master's thesis: An extensive literature study on the topics of public financing,

information asymmetry, legitimacy, storytelling, and assessment processes were conducted, and the material from this is presented in this thesis' theoretical frame of reference. This literature study helped narrow down the scope of research and introduce a nomenclature and set of theoretical building blocks which aided in the development of a theoretical framework for answering our research question. Figure 4.1. Illustrates the shift in the researchers' activities before and during the writing of this thesis.

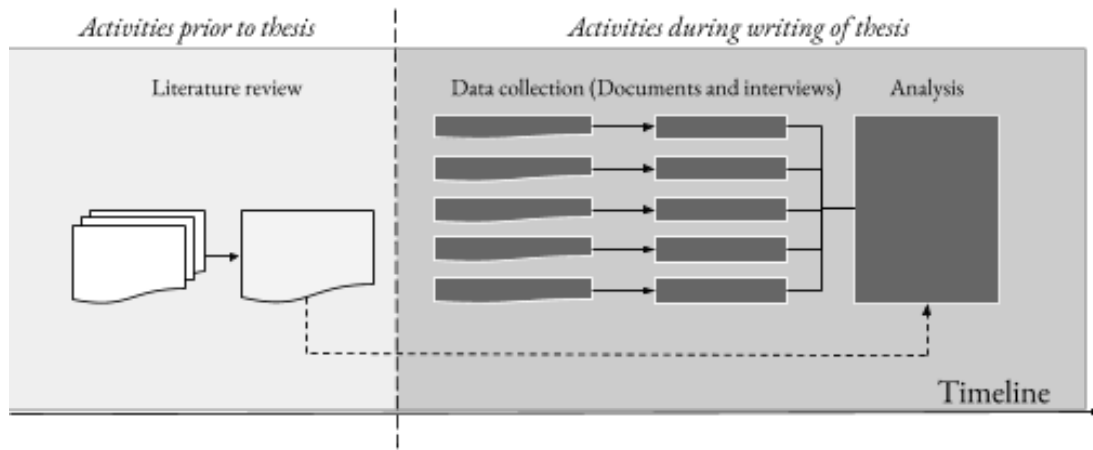


Figure 4.1: The activities prior to- and during research

**Prior to the study, a semi-structured literature review was conducted to gain a general understanding of the topics related to information asymmetry in assessment processes for public financing programs. This literature covers a multitude of topics, including public financing grants, the funding gap, early-stage financing strategies, information asymmetry, legitimacy and studies on assessment processes.*

**The term “semi-structured” points to the fact that the selection of relevant articles in this part of the literature review was often based on an initial structure or strategy, but also influenced by non-structured approaches, mixing different techniques such as forward- and reverse snowballing, which “as a first search strategy, may very well be an excellent alternative to the use of database searches” Wohlin (2014).*

4.3 Case Selection

The cases selected for inclusion in this thesis were 1) NTBFs that represented success in grant-writing alongside their documentation as data sets, and 2) professional grant writers and evaluators to investigate similarities and patterns in the process of writing. This is in line with the theoretical sampling of a grounded-theory methodology where a research question gets investigated by gathering data and analysing that initial dataset gathered from one source before reaffirming the findings using another source, a process which is repeated until the

researchers reach data saturation. The potential liability in choosing only cases with success and not comparing these to unsuccessful applicants is apparent and described under our section on Limitations. As discussed further under the limitations-section, cases were chosen to represent a “successful entrepreneur point-of-view”, and the researchers opted to include professional grant writers and evaluators to reaffirm or deny statements and conclusions derived from the successful entrepreneurs. The study investigates, “What successful entrepreneurs know and how they apply this knowledge in grant-application” rather than a comparison of successful versus unsuccessful grant applications. In hindsight, side-by-side analysis of successful and unsuccessful firm behaviours might have yielded more valuable insights as to the generalisability of our findings and analysis, but we address this in our sections on limitations and implications for further research.

In the process of selecting the NTBFs for our case studies, the preliminary screening was done through listing all NTBFs receiving grant funding from the last five years. The cut-off in time was set to reduce the risk of application-criteria changing. This was done using the database of The Norwegian Research Council to list and source the history of start-ups receiving funding between 2014 until 2019. Using this list, the researchers identified ten potential subjects based on geographical closeness, as this facilitates for easier data collection through sit-down interviews. Four important criteria were set to ensure that the subjects could be categorized as experienced, relevant and successful grant proposal writers. These are listed in table 4.1 below.

Table 4.1: Criteria for NTBF selection

CRITERIA	REASONING
The NTBF had to be less than five years old	Evaluation criteria change over time, and so does the culture of both assessing parties and policy makers. What was a successful tactic ten years ago may be obsolete by today's standards. To ensure the selection of cases showing relevant skill sets a cut-off time of five years was set.
The number of total written grant-applications was over seven	A criterion set on the basis of experience. There are a multitude of smaller grants anyone can apply to and even amateur writers usually have two to three grant-applications to show for. As this number increases, so does the level of experience. To ensure experienced writers, a cut-off of seven grant-applications was set.
The success rate of written applications was above 50%	Obtaining 100% success rate is unheard of in grant-applications, even by professional writer standards. However, to ensure we did not end up with a selection of cases that had only accumulated funding by quantity over quality, we chose a selection cut-off of 50%.
The NTBF must have sourced more than 1 MNOK (€120 000) in soft-funding.	Success is a subjective term. However, we identified that through the relevant programmes listed in table 3.1.an accumulated sum of 1 MNOK should be enough to claim success through grant-financing. This number was therefore set to ensure cases selected could be categorised as successful.

From a total list of ten NTBFs, six fit all criteria and these were chosen as cases and their applications reviewed. Two NTBFs were then cut from the case, as both got termed inadmissible as their application writers had left the company and would not be able to provide any follow-up data. In the end, the sampling was limited to four NTBFs with grant writers willing and able to partake in the study.

When selecting the professional grant writers and evaluators, we contacted four potential candidates and selected two of these based on 1) number of different projects they had worked on had to be over 50, 2) number of applications written and/or evaluated had to be over 100, and 3) ability to disclose information about processes. Although both sources have experience as grant-administrators, one has had the emphasis on writing and the other has had the emphasis on creating evaluation processes and evaluating applications. All subjects stressed the importance of anonymity as the data is of a highly sensitive nature. Information regarding the exact monetary value, applications and or name of the firm is instead encrypted using the phonetic alphabet as names and the monetary value and number of applications are listed in table 4.2.

Table 4.2: *Characteristics of the case-subjects*

Company	Role	No. of Grant applications	No. Successful Applications	Accumulated public financing
<i>Alpha</i>	CEO and proposal writer in NTBF	11	8	€3,3 Million
<i>Bravo</i>	CFO and proposal writer in NTBF	19	13	€3,7 Million
<i>Charlie</i>	CEO and proposal writer in NTBF	12	6	€360,000
<i>Delta</i>	CEO and proposal writer in NTBF	9	6	€130,000

Person	Role	No. Evaluated applications	No. Written Application
<i>Golf</i>	Grant-Administrator	>100	N/A
<i>Hotel</i>	Professional Grant Proposal Writer and Evaluator	10-20	>50

* *Key information of NTBFs selected for this case. No. of grant-applications refer to the total number of grants the NTBF have applied for between 2014-2019. No. of successful applications refer to the total number of applications that received partial or full funding in the period 2014-2019. Accumulated public funding refers to the total amount of soft-funding the respective company have collected through their successful applications.*

4.4 Data Collection

There are six sources of evidence commonly used in case studies: documentation, archival records, interviews, direct observation, participant-observation, and physical artefacts (Yin, 2014). Combining more than one of these methods is called triangulation of data and is used as a validation strategy, more specifically, triangulation of data combines data drawn from different sources, different times, different places or from different people (Flick, 2014). The research consists of two sources of evidence (1) documentation and (2) verbal data through interviews.

4.4.1 Documents

All applications the NTBFs had written was submitted by the interviewee to the researchers before the interview. These documents were reviewed, and through an iterative process where the researchers picked examples they perceived to be a combination of the NTBFs most comprehensive and newly-dated work, they contacted the application writer to confirm or dismiss this conclusion. Through this process, the researchers ended up with one full application deliverance for deeper analysis per NTBF. These documents served as a dual-purpose tool in that they gave the researchers a foundation to triangulate the empirical data sourced through interviews, and also worked as an interview-guide for the second half of the semi-structured interviews with the NTBFs. As the study explores the thought-processes of expert application writers, it was essential to let the interviewee take the researchers through their most excellent applications part-by-part, so no stone was left unturned as to what the entrepreneur thought when they wrote the specific statements and claims in their application.

4.4.2 Interviews

The interviews were conducted in a semi-structured manner where an interview-guide (appendix I) served as a guideline for the first part. For the second part of the interview, the documents (applications) served as a guideline. Conducting the interviews in a semi-structured manner was vital as it provided the possibility of asking probe-questions when it was necessary for the subject to further explain or elaborate on their answers (Saunders, Lewis & Thornhill, 2012). This also helped maintain a conversational flow to extract a maximum of relevant information from each interviewee. The interviews with the NTBFs typically lasted 90 minutes, and the interviews with the professional writer and grant-administrator lasted 60 minutes. The interviews were conducted in different locations, but always in similar environments and formats, generally a conference- or meeting room and with one author asking questions and conversing with the subject, and the other observing and taking notes. A digital audio recorder was used to record every interview. In ensuring truthful answers, it was

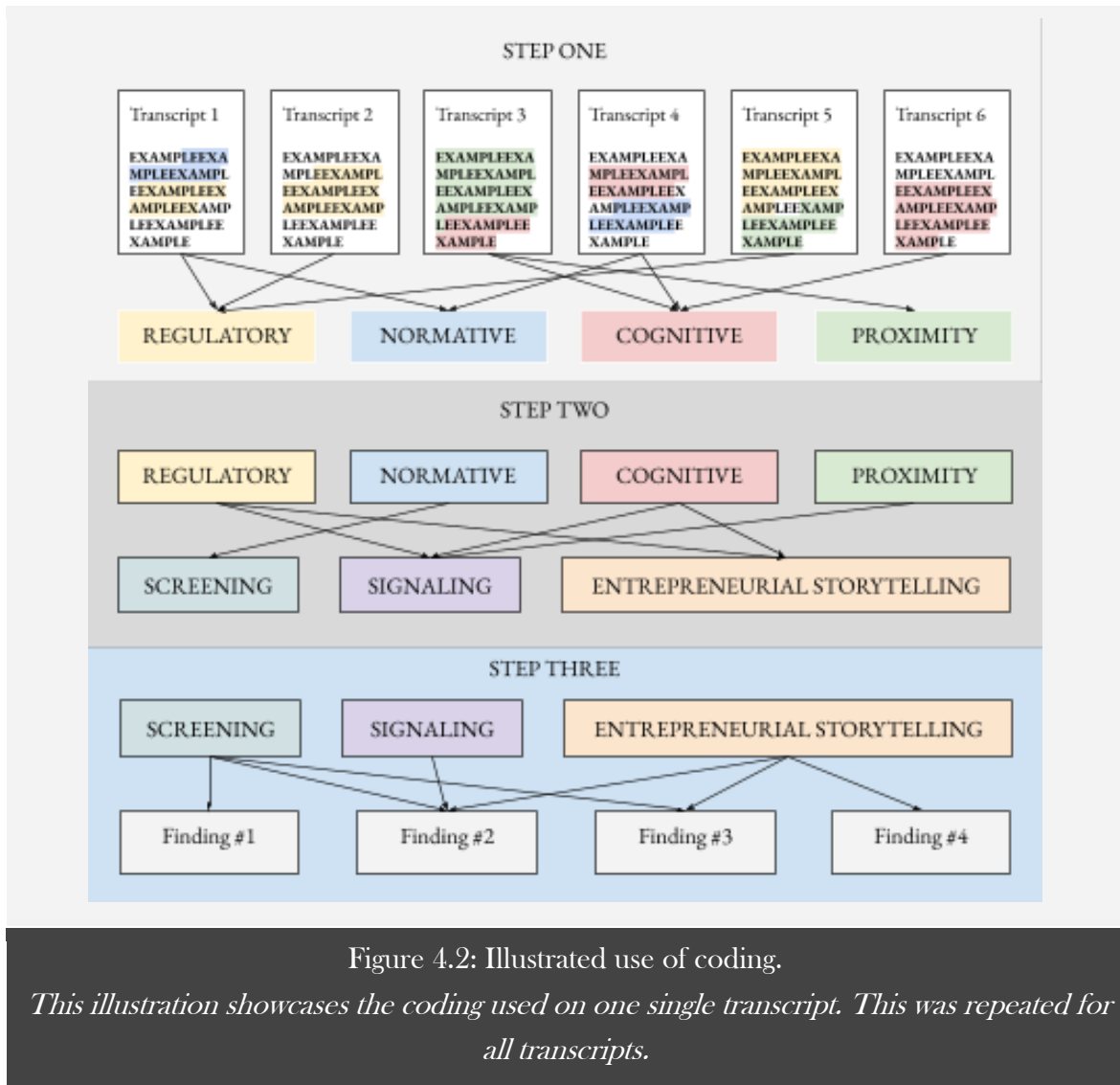
a priority to create an environment of trust and ensure confidentiality, and so the interviewees were guaranteed anonymity and that their recordings get deleted after transcription.

4.4.3 Ethics

Following the ethical and legislative guidelines proposed by the National Resource Ethics Committees, the researchers conducted the study according to ethical guidelines. Concession in regard to the use of personal data will be in line with the act of Processing Personal Data, section 31 (NESH, 2016). The researchers' overall goal in regard to ethics is to inform all participants well and handle the data gathered with the highest possible level of care and confidentiality.

4.5 Data Analysis

The analysis of the documents was done by thoroughly reading case documents and highlighting explicit terms and section that stood out as relevant according to Fischer's (2016) evaluation criteria for legitimacy in NTBFs in the conception and development or commercialisation stages, as per our theoretical framework. In the application texts, the usage of any language resembling regulatory, normative, cognitive and proximity was highlighted and later brought up for closer scrutiny during the interview. In exploring the usage of any specific rhetorical devices, we based our analysis around the legitimacy-building sources of entrepreneurial storytelling, and similarly brought such topics up during interviews with applications writers to explore their motivations and thought-processes for writing this. Post-interview, the researchers discussed the outcome of the interview and identified initial findings. The interviews were then transcribed within 48 hours. The transcriptions were written manually and saved offline. The transcriptions were then coded using our theoretical framework, with emphasis on nodes concerning the building of legitimacy through the use of regulatory, cognitive, normative and proximal sources. The inductive nature of our research also saw other interesting patterns appear during this phase, and a second round of coding concerning stories and narratives was conducted alongside the integration of these new nodes. All coding was done manually, and the researchers used colour coding to highlight a theme or topic mentioned in the transcription. The coding was performed as illustrated in figure 4.1.



These colour coded topics were then summarised into several individual documents to simplify the final analysis, as recommended by Saunder et al. (2012) who points out that summarising longer texts into shorter reports is useful when the goal is to cross-reference themes. After coding and summarising all empirical data, the themes were prioritised based on relevance to the research question and theoretical framework. All coding was done by searching for cross-report patterns in the data with the goal being to find (1) *Contradictory statements* and (2) *Affirmative statements* regarding the respective themes to base conclusions on and develop theory as is the goal with a grounded theory methodology.

4.6 Evaluation of Method

The researchers are responsible to reflect upon the contents of this paper that contribute either positively or negatively to the thesis' validity and reliability. This section discusses the construct validity, internal & external validity, reliability and limitations of the study to assess the quality of this thesis. Table 4.3 shows the tactics used in used to ensure validity and reliability throughout the process of the research. These tactics are further described in the upcoming sub-sections.

Table 4.3: Test of Reliability and Validity

Tests	Tactic	Phase
Construct validity	Multiple cases	Research design
Internal Validity	Pattern matching	Analysing
External Validity	Using replication logic	Data acquisition
Reliability	Triangulating data	Research design

4.6.1 Construct Validity

A quantitative approach was discarded early on, as this would have been an infeasible method in investigating the research question due to the nature of the study being concerned with the creation of in-depth knowledge about subjective choice-making. The researchers found a quantitative approach to limit the possibilities of acquiring such knowledge as the data, despite enabling both an increased number of samples and viewpoints, would be too shallow and general to find common patterns in the subjects' thought-processes. To suitably address the research question, the researchers opted to use a qualitative approach. The qualitative research methodology is recommended when the goal of the study is to answer questions like *how* and *why* (Yin, 2014). Specifically, the combination of a case study and a grounded theory methodology helped answer and proficiently assess the research question as it aided developing theory in an exploratory and inductive way through unpacking the themes surrounding the research question. An apparent weakness in case studies is that the data collected is filtered through the researchers' subjective judgment (Yin, 2014). As a countermeasure to the potential outcome of subjective judgments leaving out essential parts, the interview subjects were given an opportunity to review their contributions to the thesis in order to increase construct validity. The use of multiple data sources in order to triangulate data points helped gain a deeper understanding of the topics through a smaller sample size than generally used in grounded theory-methodology, where the sample size usually includes over twenty individual participants. The detailed reviews of secondary data (documents) were

also done to increase the construct validity of this thesis. The subjective nature of human beings means there is a possibility that some of the data gathered through interviews is flawed or invalid. This risk of drawing invalid conclusions is reduced by using multiple data points and triangulating the data to create a holistic basis for the analysis. The thesis was designed for trustworthiness (Lincoln & Guba, 1985) by actively questioning our objectivity throughout the writing of the thesis to avoid confirmation bias or other forms of confirmability.

4.6.2 Internal Validity

The critical question in assessing internal validity is looking at whether observations can be attributed to the exposure and no other possible causes (Carlson & Morrison, 2009). Internal validity asks how much the study itself affects the data the results are based on. Using multiple sources of data obtained prior to the study in a combination of the data gathered from interviews with both the application writers as well as professional grant writers was done to increase internal validity. The similar patterns emerging despite coming from different sources of data speaks to internal validity, solidifying the basis for drawing conclusions based on these observations. The internal validity is concerned with the causal relation of outcome and subject, and that the research groups should consist of different subjects. In medical studies, the use of a control group ensures internal validity and is one element not accounted for in this study, decreasing the internal validity of this thesis, as addressed in previous and later sections. As Carlson et al. (2009) state: *“The internal validity of a study may be compromised by not having a control group or by having a control group that is not comparable to the exposed group in measurable or unmeasurable ways.”* As mentioned, the use of multiple data sources and the pattern matching of these is ways to counteract the negative consequences and increase internal validity despite not including a control group, but the researchers acknowledge the lack of a control group in the form of non-grantees as a weakness to the study and thesis.

4.6.3 External Validity

External validity is the ability to generalise results in a universal population (Rothman, Greenland & Lash., 2008; Carlson & Morrison, 2009). The use of replication logic amongst various data sources was done to increase the external validity of this thesis, so was the reasoning for choosing multiple cases and data points. The replication logic (Yin, 2014) implies that the selection of cases should get made on the grounds of the predicted similar outcomes, as is the tactic used in this study. (*Criteria for case selection described in detail in table 4.1, p.56*) As mentioned, the study consists of a generally low number of cases, making it difficult to know whether the findings are generalisable or not (Yin, 2014), thus decreasing the external validity of this study and thesis. The combination of in-depth data from selected

cases and the input from entrepreneurs, professional grant writers and grant administrators was used to generalise the findings and increase external validity. The external validity would further increase if the research consisted of a higher number of resources to explore other cases, but the scope of this study did not enable that. It is also important to note that the external validity of this thesis applies only to the time and place in which it takes place, and that other cultures could experience other outcomes. The time and place here refer to the ecosystem displayed in the contextual frame of reference in this thesis, which is also addressed as a limitation to the topic of public financing programmes in general, as these are inherently connected with frequent changes in administration, structure and political influences. To find universal commonalities to develop generalised theories upon, the research would have had to include data from NTBFs from all over the world, but due to the idiosyncratic characteristics and complexities of different grant programmes across different agencies and geographies, the researchers consider this to be infeasible.

4.6.3 Reliability

Also known as dependability (Lincoln & Guba, 1985), the reliability is concerned with the study being replicable and the consistency of its findings. Other researchers should arrive at the same conclusions if the procedure is repeated using the same cases (LeCompte & Goetz, 1982). The researchers used methods to address the consistency of the procedure, with the goal of minimizing errors and biases in accordance with Yin (2014): Elements of a case study protocol was developed to enable replication logic, as well as elements from a case study database that includes interview guide, the theoretical framework and a coding manual. All procedures were documented as detailed as possible, so the work could be replicated in the same manner. The specific protocol used in this thesis is illustrated in figure 4.2, p.64.

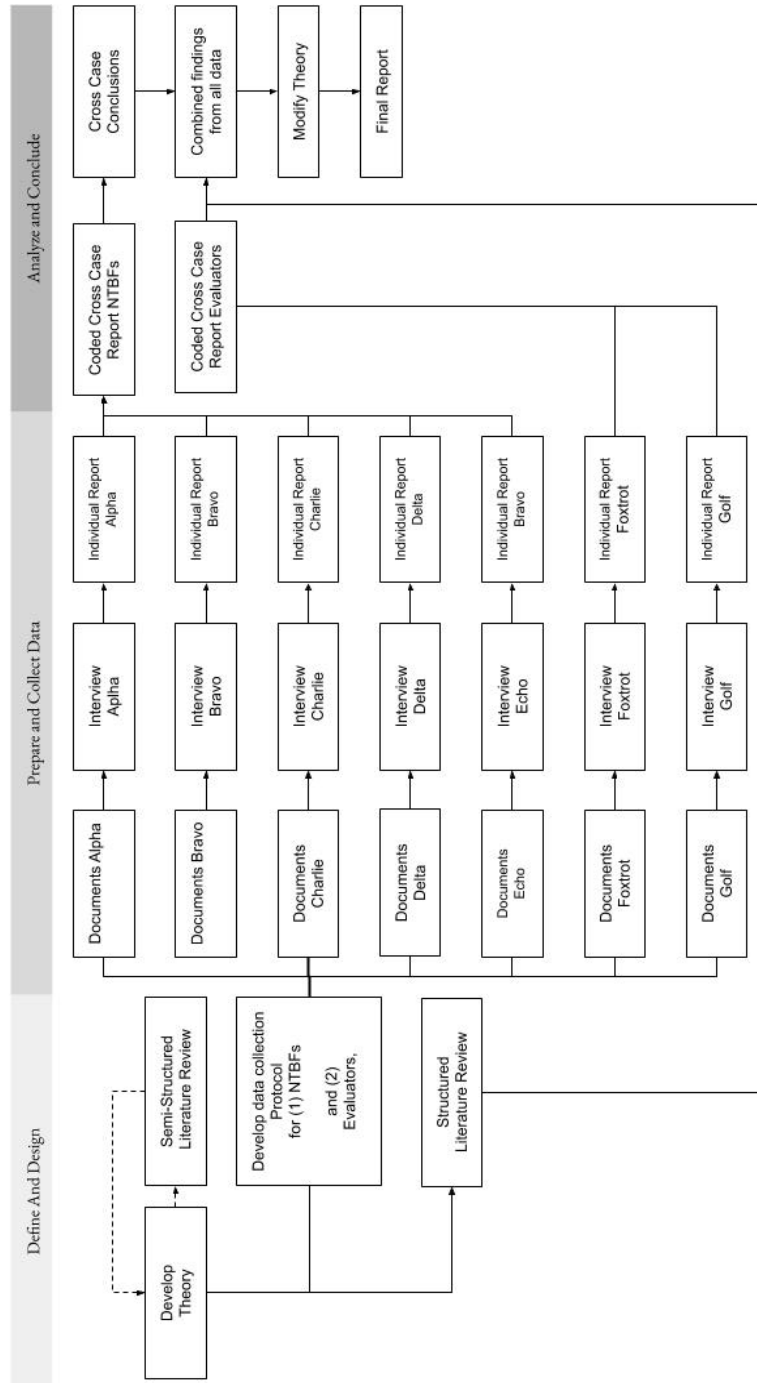


Figure 4.3: Process of Case study protocol.

Authors adapted from Yin (2014)

Initially, a hypothesis or set of research questions were developed based on the findings of the preparatory literature study. The initial theory potential subjects for the case studies were then selected. Then, the interviews were conducted and a case report for each case was written. Lastly, the cross-case report was written and analysed. Conclusion(s) were derived from this cross-case report using the theoretical framework based on the literature review.

CHAPTER 5

FINDINGS

Our research demonstrates that grant applicants can deliberately exploit informational asymmetries in the public grant selection process to maximise their chances in grant financing competitions, and that they can do this through several means of consciously signalling key informational cues through their written proposal texts. These informational cues manifest themselves as a multitude of legitimacy-building devices that are used to attain and maintain legitimacy for the claims and overarching narratives presented in their texts. In the following sections, we extract several concrete examples of how our researched firms used normative, cognitive, regulatory and proximal legitimacy-building devices to build legitimacy for their proposals.

4.1. Legitimacy Attainment in Public Financing

The empirical evidence from our analysis of written application texts and interviews with application writers supports previous research in that entrepreneurs behave opportunistically and exploit conditions of information asymmetries to build legitimacy (Fischer et al., 2016; Lerner, 2002) in the context of public financing. We further find that NTBFs demonstrate uses of legitimacy-building devices in line with Zimmermann & Zeitz' (2012) four sources of legitimacy. The proposal writers displayed a wide repertoire of literary, graphical and rhetorical devices for increasing their regulatory, normative, cognitive and proximal legitimacy in the eyes of their audience of expert panellists.

From our theoretical framework, we know that regulatory legitimacy is sourced by signalling that the firm abides by relevant regulations, standards and legislation. Since the question of certification is often a topic for proposal writers when describing their new products and services, this often becomes an opportunity to source regulatory legitimacy in grant proposals. However, even if the firm is lacking on this point, there are ways of sourcing regulatory legitimacy nonetheless. To demonstrate how NTBFs can exploit conditions of information asymmetry to increase their regulatory legitimacy, we use an excerpt from *Alpha's* proposal for European Commission's "Eurostars" grant programme. For context, Alpha is a medical device venture, where certification is, of course, a central topic.

There is risk associated with regulatory approval of [Alpha]’s products as either class 1 or class 2a medical devices. [Alpha] will improve their competencies within medical classification by employing qualified clinicians/medically skilled personnel with responsibilities for documentation and medical approval processes. [Alpha] has chosen suppliers and partners with experience in medical approval processes of class 1 and class 2a devices, namely [Institution A], [Institution B], [Institution C] and [Institution D].

Alpha

Elaborating on the underlying logic for this section of their application, Alpha’s founder commented: *“Here, we already write that we have no idea which risk class we will end up in, but that it is either class 1 or class 2a. What we are really saying is that we have no clue, but we continue to write that we have found partners that can help us with this stuff either way. Although we did not really have this in place at the time we wrote it, the text makes sense based on this information.”* Since Alpha suffered from lacking certification for their product, they had to think creatively to hide their lack of regulatory legitimacy and ended up doing so by pointing to future “partners” and future personnel that would assist in mitigating these challenges in the future. Beta exhibited a similar regulatory-building device by listing a comprehensive table full of relevant certifications and standards that might apply to their proposed Eurostars project. Beta’s proposal writer recalls:

To ensure that we make a convincing case that we have control over the required certifications for our [product], we used an old list which we sourced from a contact of mine who works in [a well-known industrial actor in the same industry], which had everything we needed and probably more. I do not think anyone really looks into any of it, but having that table sends a message that we know what we are doing.

Beta

By attaching themselves to other, more well-known and established institutions, firms can therefore effectively downplay their own weaknesses by proxy of another firms’ expertise. This is consistent with Stinchcombe’s (1995) observation that legitimacy from endorsing third parties can spill over into the recipient, and firms seem to act opportunistically by exploiting the grant agency’s lack of insight into the underlying proof or logic behind each stated relationship with established industrial and institutional actors, thereby potentially accessing powerful signals of regulatory legitimacy without having to pay the cost of truly earning these signals. In this way, firms can disguise their weaknesses in the regulatory domain by demonstrating that these issues will be taken care of with the assistance of reputable firms and partnerships.

Endorsements and partnerships with reputable institutions were frequently used as legitimacy-building devices also to attain other sources of legitimacy, not only regulatory. For example, *Delta* used external ties to a well-known company to build normative legitimacy for their proposal. Interestingly, these legitimacy-building devices were often used even if the connection between the NTBF and the partner was weak. As *Delta* commented: “*We often write about partnerships with well-known institutions, even if we just had a few meetings. In reality, we have just spoken to them a few times, but in the application, you can present it as a close collaboration.*” Since the entrepreneurs can safely assume that such claims will rarely be scrutinised closely enough to distinguish between what level of cooperation qualifies as a genuine partnership and what does not, exaggerating weak connections to well-known institutions as stronger relationships or partnerships can be seen as another device for gaining access to valuable signals without much of the otherwise needed effort and cost related to earning those signals. *Delta* continued:

We had a conversation with a supplier about them manufacturing [a key resource] for us, and we wrote that in as a partnership in the application. Even though it is being a real partnership, the chance of anyone scrutinising that relationship is very low, they probably just read it, think “OK” and move on.

Delta

As seen from the evaluator’s side of the table, it is very difficult to know without closer due diligence which partnerships are in fact genuine, and which are just weak ties.

Similarly, professional grant proposal consultant *Hotel* described how informational barriers make it difficult for grant agencies to properly assess and validate the entrepreneurial team capabilities as described in the grant proposal: “*The team is of great significance, but it is very difficult when you read an application in half a day or a day to validate how good their CVs are and how good the team is, so you often have to just trust what it says. Your claims are strengthened if you have references to some real, relevant experience with previous start-up activity or participation in other big projects, but it is often difficult to verify what the proposal says.*” This further exemplifies the possibilities for NTBFs to exploit informational barriers in the screening processes used by grant agencies to protect their claims from the scrutiny of grant evaluators, which leads us to the following proposition:

Proposition 1: *NTBFs can increase their legitimacy and subsequently their chances for success in public financing competitions by making exaggerated claims of their ties to other firms and institutions. They can do this knowing that the grant evaluators are limited in their ability to discriminate between real and constructed signals without proper insight into the firm’s underlying information. In this way, NTBFs can gain access to valuable signals of legitimacy without the usual concomitant efforts or costs of accessing those signals.*

Editorial Processes and Graphical Elements as Legitimacy-Building Devices

Another central observation from our analysis is that NTBFs source legitimacy for their proposal texts by deploying thorough editorial processes for the rhetorical narratives and graphical contents of their proposals. The motivation for this behaviour can be connected to several legitimacy-building devices, mostly in the cognitive domain.

Ensuring that the application is pleasing and easy to read makes the jury members' experience more enjoyable, and so based on our findings from successful grant proposal writers, ensuring that the proposal deliverance is easy to read and includes eye-catching graphical elements like charts and images is an important contributor to successful project proposals. Professional proposal consultant Hotel commented: *"How readable the text is matters a lot, as you want the evaluator to enjoy his or her experience. I always make sure to include graphical elements for this reason. Tables are another way of breaking up the text, so it is more readable."* Similarly, Delta described:

Over time, we have learned that using images and pictures is incredibly important, so we sacrifice a lot of space in our applications in order to make room for images. It is about the overall impression, it has to look smooth. If there is a wall of text, it is hell to read, so breaking things up with explanatory pictures and bullet points is more appealing to read. After sending a lot of applications, we have learned that this is what works.

Delta

Even at the cost of scarce proposal real-estate, successful grant applicants seem to value inclusion of graphical elements rather than additional text, in order to facilitate for a more pleasant reading experience for the grant evaluators.

The first pages of grant proposals seemingly receive special consideration, as they represent a crucial chance to make a good or bad first impression, an impression which may linger throughout the remainder of the application. As Alpha commented: *"My impression is that you either win or lose the application in the executive summary. After they have read that, if they are left with a good impression, you have a much, much bigger chance of receiving that funding than otherwise."* Similar sentiments were expressed by Bravo: *"The first page, and more specifically the first sentence and the first paragraph, those are the most important parts of the entire application."* Apparently, NTBFs with high success-rates in public financing extend special effort to facilitate for an enjoyable reading experience for their audiences so that they might carry this momentum into the remainder of the application. As always for legitimacy, it must then be further built upon and maintained throughout the rest of the proposal.

Many of the cognitive legitimacy-building devices employed by our researched firms are not even connected with the contents of the proposals: Firms are creative in the way they use different fonts, spacing, colours, tables and diagrams to improve the design and formatting of their proposals. Delta elaborated on a rather extreme example of the level of detail that can go into building cognitive legitimacy through visual elements: *“If the proposal templates allows it, I make deliberate choices when it comes to text and font types, based on research of what looks most professional and trustworthy. All the details matter, and if you want to stand out from a load of applications, of course it can be subjective, but Arial Bold for titles and Baskerville Old Face for text has a documented effect as the most convincing and trustworthy combinations, I think.”* Even by changing font types, NTBFs seemingly work to nudge their chances of success in the right direction, however slightly, by deploying legitimacy-building devices like graphical elements and visual impressions. These devices mostly work in the cognitive and normative domains: Cognitive components are the more subtle elements like readability, spacing and presence of pleasing visual impressions, while the normative elements pertain more to the contents of the graphical elements, like how organisational charts can signal adherence to organisational norms, or visualisations of technical development timelines can be a source normative legitimacy about the firm’s operational capabilities. As an important distinction between these two, we find that cognitive legitimacy gained from graphical elements is more independent of the underlying qualities of the firm or project, and therefore more generalizable across different cases and programmes. In other words, using tables, images, formatting and layouts can help grant applicants build legitimacy from cognitive sources, even though these signals are not directly connected to the qualities of their venture or proposed project. The normative legitimacy-building components pertain more to the contents of the graphical elements, and these signals are therefore more connected to the qualities of the underlying firm or project. This leads us to our next proposition:

Proposition 2: *Firms can use thorough editorial processes to source cognitive and normative legitimacy from graphical elements and facilitating for a pleasant reading experience for the expert evaluators. Of these cognitive and normative legitimacy-building devices, cognitive components are sourced from the mere presence of such graphical elements and narratives, while normative components are dependent on the contents of the graphical elements. Cognitive legitimacy from the presence of graphical design elements in grant proposals is therefore seemingly disconnected from the qualities and characteristics of the applicant firm, while normative legitimacy is not.*

The Role of Narratives and Entrepreneurial Storytelling

In addition to graphical elements, visual impressions and ensuring good readability, we find that NTBFs build and maintain cognitive, normative and proximal legitimacy by developing coherent and compelling narratives for their proposals by using entrepreneurial storytelling as a legitimacy-building device. The narrative of the proposal builds legitimacy in several ways, but zooming in on its cognitive elements, we find that proposal writers work deliberately to maintain a consistent narrative to tie together the informational cues signalled through their normative and regulatory claims and constructs. As Alpha deliberated:

If you are sitting in a meeting with an investor and you stumble on something, he or she can really get stuck on that one bit which does not make sense, and once things start circling around that one thing, you have kind of lost. In soft funding, too, from our perspective, it has been important to weed out all the tripwires that have been baked into the application that might make the evaluator start thinking negatively about the application. So, it becomes about putting up a really pretty facade, and one that is solid enough that if they start digging a little, they don't find anything.

Alpha

Here, Alpha describes an important attribute of legitimacy which we recognise from our theory-section, which is that it must be continually maintained. This means that proposal writers are vulnerable to discrepancies or inconsistencies in their texts, as these may be severely damaging for the proposal's perceived normative and cognitive legitimacy. As a cognitive legitimacy source, ensuring that the proposal is free from errors and has a sensible, logical, coherent narrative therefore helps NTBFs signal cognitive and normative legitimacy to the jury.

Another legitimacy-building attribute of the written application's overarching narrative is its function as a proximity-building device. Our findings demonstrate how NTBFs rely on high-level narratives throughout their applications to build cognitive legitimacy for their applications by ensuring their stories make sense. Similarly, *Alpha's* proposal writer proposed that their narratives could be widely different and even contradictory depending on the topic of the grant programme, so long as it is coherent seen in isolation (how the evaluating panel will see it). *Beta's* proposal writer similarly commented: *"When I write the application for RFF, I always emphasise the impact of the project on the region, you know, because that is what they want to see. So, I might say that we are planning on establishing the company here in the region, and that the grant funding helps us do that, and helps us keep jobs in the area or build on the local research cluster or something. But then I might also say in a different application, say to the EU, I might say that we are planning to move the company to these EU*

countries. They cannot both be true, but the EU and RFF people do not read each other's' applications, so they cannot see that."The expert panel has no previous knowledge or outside information to source in their scrutiny of the application, and neither do they have access to the firm's previous project proposals. In this case, the NTBFs exploit a different informational barrier: not between the grant agency and their firm, but between the different grant program administrations. This leads us to propose the following:

Proposition 3: *NTBFs can use tailored and coherent narratives to build cognitive and proximal legitimacy for their proposals, and thereby appear favourable by grant assessment panels over competing submissions. The lack of insight between different grant programmes' proposal texts makes it possible for grant applicants to develop tailored, and even contradictory narratives to each grant competition, so long as they are coherent seen in isolation.*

Maximising Grant Funding through Project-Based Development Plans

As we have established in our theoretical frame of reference, Fischer (2016) described how firms face issues relating to differing normative and regulatory expectations in their interfaces with new audiences as they move from one stage of their life-cycle to the next. As an interesting result of the approach displayed by our proposal writers, where firms pursue multiple projects in parallel to maximise grant financing, these firms often follow complex and recurring development paths, moving forward and back in maturity in order to maximise the value of grant competitions within each phase. All four of our researched firms either currently or previously had active projects in multiple stages of maturity at the same time, most commonly commercialisation projects running in parallel with conceptualisation projects. We found that firms can do this by dividing their internal development plans into a project-based, multi-staged development plan, and then applying for grant financing for each separate project. Please see figure 5.1. for an example from *Beta*, who had parallel projects developing two different products, and a separate development path for developing their production technology. This allowed them to have up to three projects running in parallel.

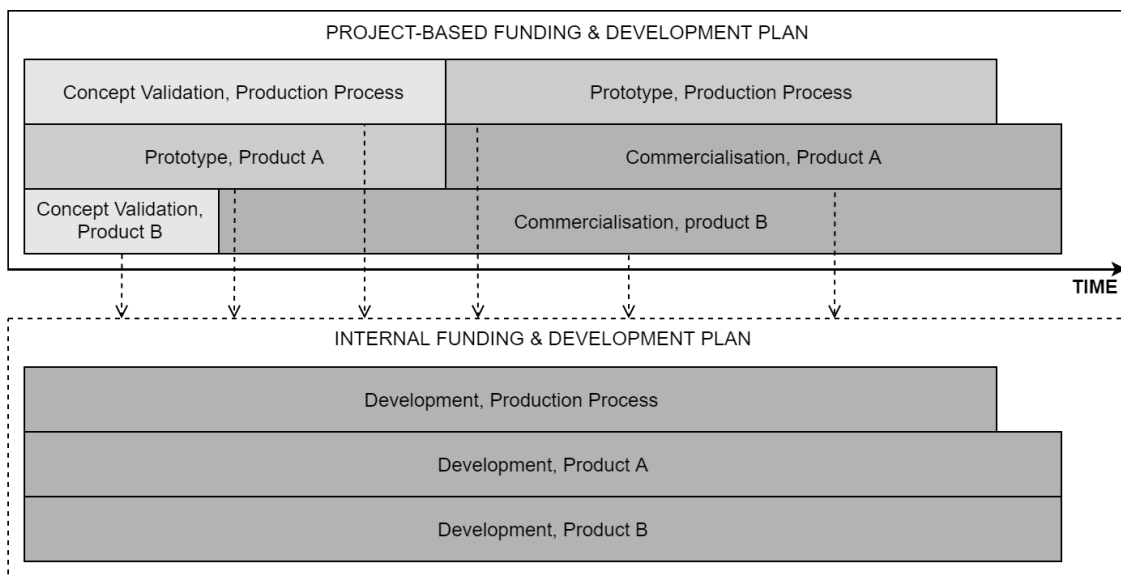


Figure 5.1. Allocation strategies of NTBFs

Dividing internal development plans into a project-based plan allows firms to maximise funding opportunities in the grant system without running into counter-arguments of additionality (Adapted from *Beta's* financing strategy).

As illustrated in the figure above, *Beta's* public financing strategy was to exploit all possibilities available to them in the public financing system, and to mitigate the emerging weaknesses relating to additionality, i.e. justifying the necessity for multiple grant projects running in parallel, divided their internal development plan into three distinct channels: One for

developing their core technology, a new production process, and two separate channels for developing niche-targeted products based on that underlying production process. Each channel was then divided across multiple available grant programmes in the conception and commercialisation stages, thus maximising their possible extraction of public funds. We find similar sentiments across our sample, with *Alpha*, *Charlie* and *Delta* all distinguishing clearly between each project's scope in relation to their internal development strategy. To illustrate, *Delta* commented:

0commercial prototype, while the funding from Innovation Norway goes towards a pilot project in cooperation with a pilot customer. Our final project is for a different collaboration project with a different pilot customer.

Delta

Although these activities are all part of the NTBFs continuous internal development plan, the distinction between each project, and ensuring that each project scope is non-overlapping allows them to have several projects in parallel.

Interestingly, we find that this financing strategy makes NTBFs susceptible to experiencing challenges similar to Fisher's (2016) description of institutional pluralism, as the normative and regulatory expectations of each grant agency are widely different, and increasingly difficult to maintain as the firm takes on more and more projects. The challenges are not merely related to the added administrative and bureaucratic duties that follow with each accepted grant proposal, but also relates to maintaining their legitimacy as they must adhere to the varying and sometimes conflicting identity claims and expressed intentions that they have committed to with each proposal. Luckily, project plans can usually be changed underway, so these effects can at least be partially mitigated after the fact by changing the project scopes when the proposals have been approved and the projects are underway. This gives the firms a certain amount of flexibility to skew their projects towards their internal development plans and motivations. From the grant agency's perspective, once the grant decision has been made, their main objective is to facilitate for the grantee firm's success, so such changes should be obliged so long as they are aligned with the company's internal strategy. *Beta's* application writer talked about this as "*Getting inside the door*". *Alpha's* founder similarly commented,

"We have used these projects and to some extent overlapped them to keep control of liquidity, so that we in actuality have had a more internal timeline on recruitment and tech development and stuff like that, which we have had pretty good control over. Then, we have used these projects as levers to pull on in order to improve our liquidity or prolong our runway. To put in in another way, throughout the process with the different projects, we have been more interested in securing the grants first, and then triggering the

disbursements and seeing if everything works out afterwards. (...) You are asked to write that this is one project, and this is another, and there are no overlapping activities between these activities, while in reality, all the funding is funnelled towards your core activities. There are no start-ups that have this many different projects going on. It is exclusively one big project, and that project is to establish the business so that you can start making money.

Alpha

To this last statement, a very similar sentiment was expressed by *Charlie*: “*We wrote that different grant funds should go to different projects, but the main project was always to develop our technology.*” We see from these statements that NTBFs display alternative motivations which they hide from grant administrators and evaluators, as their internal development and financing plan is different to what they portray through their grant proposals. As a mitigating resource, grantees can change the scope and direction of their active projects once they have been approved. This presents an opportunity for firms to be flexible and adaptive in the preparation and development of the project proposal in order to get “inside the door”, before shifting the project’s focus towards their internal objectives afterwards. Following this, we therefore conclude with this final proposition:

Proposition 4: *NTBFs can maximise their grant funding intensity by dividing their internal development plan into separate individual projects, and then securing grant financing for each individual project. However, firms taking this approach may face challenges of institutional pluralism, having to adhere to differing standards, expectations, narratives and identity claims that they have committed to with each grant agency and application.*

CHAPTER 6

DISCUSSION & IMPLICATIONS

In learning how NTBFs with high success rates in the public financing system develop their applications, we are able to make contributions to extant theory along two main dimensions: Towards literature streams within legitimacy and information asymmetry, our findings will contribute to bettering our understanding of firm behaviour under conditions of informational asymmetries by describing how NTBFs build legitimacy in the context of public financing. Towards literature streams surrounding the purpose and function of public financing, our findings demonstrate several mechanisms in grant screening processes which we have argued make grant agencies and programmes unnecessarily susceptible to the aforementioned opportunistic behaviour and adverse selection effects from their applicant base.

Perhaps the most noticeable part of our findings is that there are vulnerabilities in today's screening processes for public financing, and that firms are exploiting these vulnerabilities to maximise their chances in the competition over innovation grants. As a central topic to our analysis, we have placed emphasis on identifying our researched firms' displays of exploitative behaviour, sometimes demonstrating adverse motivations and opportunistic behaviour that might be interpreted as morally questionable. Our first topic of discussion concerns this observed opportunistic behaviour, and whether or not we should consider this behaviour problematic.

As was covered in the contextual frame of reference, public financing initiatives are usually based on two high-level objectives or assumptions: First, to create long-term value for society by investing in companies with high growth-potential, and second, to make investments in companies experiencing a "funding gap", where the conventional debt and equity markets fails to meet demand for risk capital. On one hand, repeatedly awarding grants to the same firms seems counterproductive to the first objective, as fewer firms are being helped across of the funding gap overall. On the other hand, if these firms are able to secure multiple grants because their venture's inherent growth potentials and qualities are higher than others, public financiers are investing in high-quality investment opportunities, which is aligned with the second objective of public funding and therefore should be unproblematic, and even encouraged. The problem only arises if firms are able to attract grant financing for reasons other than the qualities of their underlying venture. It is therefore interesting that our research

demonstrates that some legitimacy-building devices are seemingly independent of the characteristics of the venture or proposed project.

The notion that NTBFs deliberately adapt their texts to convey different legitimacy signals towards the audience demonstrates how selective and flexible NTBFs can be with what information they choose to include in their applications. Proposal writers typically choose to include select information about their technological, commercial and organisational strong points in order to build regulatory, normative and cognitive legitimacy about their idea and venture. Perhaps more interesting is that proposal writers sometimes also emphasise the importance of *withholding* key information to maximise their chances of being positively reviewed by the grant administrators and/or independent assessment panel. Information does not have to be negative *per se* to be omitted, so long as it might invoke a negative score from the grant assessors. One example can be information regarding alternative sources of financing, such as other grant financing or incomes from secondary revenue sources, which undoubtedly would be regarded as a positive signal in many other settings, but in the context of public grants this could potentially count negatively towards the project financing's degree of urgency or additionality. Because of the informational barrier between the grant evaluator and the applicant, NTBFs can omit information from the application text, thus rendering it "out of bounds" for the evaluators.

As we have found from our research into NTBFs and their work in the public financing system, experienced proposal writers are very aware of which buttons they need to push to be received positively by their panel of expert evaluators. Regional grant providers can expect their applicants to pitch ideas that are angled towards regional objectives, even if these objectives are not fully aligned with the firm's own internal objectives and behaviour. Industry-specific grant competitions similarly can expect applications claiming membership or proximity to the industry at hand, even from industry outsiders. Environmentally focused grant competitions are sure to attract proposals from firms exaggerating their product or service's positive environmental impacts. The fact that entrepreneurs manipulate information about their venture in order to be perceived in a favourable light is well-supported in extant literature and is simply something we have to acknowledge as an adverse effect from conditions of information asymmetry. Save for false claims or fabrications, entrepreneurs are expected to twist the truth in an optimistic light, and we should expect nothing less in the competition for grant funding. After all, taking the moral high ground is not going to get you very far either, as you will be competing against other applicants with the same possibilities. A certain amount of speculation and idealism is always necessary to convey ambition, and even if you refuse to make any uncertain or speculative claims, someone else certainly will. The responsibility for any adverse effects from NTBFs' exploitations and opportunistic behaviour in the public financing system falls, therefore, not on the applicants, but on the grant financing

agency. On their side, grant agencies can disincentivise this behaviour by demanding sources for claims, requiring formal letters of intent from demanding customers or partners, or in other ways set higher standards for documentation of concrete evidence for the applicant's claims and constructs.

Many of the legitimacy-building devices that we discovered during our analysis seemed to work on a subconscious level using subtle signals like font types, entrepreneurial storytelling and visual impressions. We found that this was especially with cognitive devices, which often worked to nudge the evaluator's attention towards certain focal points of information of the firm's choosing. The way these devices seem to work on the subconscious and subtle level bears certain similarities to what would be regarded as Kahnemanian "system 1" responses in the expert evaluator (Kahneman, 2011), with all the cognitive heuristics and shortcomings that this entails. As a further similarity to Kahneman's teachings, simply being aware of these cognitive heuristics may be an effective method for mitigating their effects. Similarly, for our findings, we hope that describing the devices and behaviours of firms towards grant agencies and expert evaluators can help reduce the impact of adverse behaviours and devices as evaluators and grant administrators can become aware of them. For example, our finding that grant applicants frequently exaggerate the strengths of their partnerships and ties to external institutions indicates that grant evaluators might wish to be conscious of this device, discounting signals of legitimacy drawing from a firm's partnerships, endorsements or proposed strong connections to its environment, or at least judging such merits more inquisitively.

Our fourth proposition is that firms can attract numerous grant awards by dividing their development processes into multiple discrete, non-overlapping projects, and securing funding for each project by coupling them with their own respective grant programme. This finding can contribute to explaining the observed "Matthew effect" in research funding. That is, researchers who win grant financing early in their careers have been shown to be more likely to win additional grants later on in their careers (Bol et al., 2018). The researchers suggested two contributing mechanisms to the observed Matthew effect: first, that candidates who won prior awards are evaluated more positive by grant assessors than non-winners, and second, that scientists that are successful in past contests are more active in participation in subsequent research funding competitions. Although Bol et al.'s study relates to academic research grants rather than entrepreneurial grants, the contributing mechanisms to the observed Matthew effect seem to be transferable also to entrepreneurial financing and public grant programs: As we covered in our theory section, assessment criteria of both private and public financiers typically put heavy emphasis on the entrepreneurial team's track record and experience, one could expect previous successes in grant competitions to signal competence and experience in project management and/or execution of technical development projects. Furthermore, as

many grant programs are divided into consecutive phases, winners of “Phase 1” financing would likely be more inclined to apply for additional “Phase 2” funding, given successful completion of the first project. Similarly, on the supply side, sunk cost fallacies (Arkes and Blumer, 1985) may also come to mind as a possible contributing mechanism to the Matthew effect, although, to our knowledge, no empirical research has made this claim.

Our research offers an additional contribution for explaining the observed Matthew-effect in the public grant system: The specialised competences of experienced grant proposal writers. If one thing is clear from our research, it is that the grant proposal writer is a most central asset to NTBFs pursuing public grant financing, and so it does not seem unnatural to assume that entrepreneurial teams with experienced grant proposal writers will have higher chances for success in later grants after receiving their first one. It could be, therefore, that the observed Matthew Effect in public financing is explained by the different skill sets of different grant proposal writers, with some firms competing favourably time and time again because their proposal writers are simply more competent at building legitimacy in their texts than others.

The existence of a Matthew effect somewhat also relates to studies that have questioned whether government funding agencies are susceptible to picking winners based on their likely success and fund them regardless of the necessity of the government grant itself (Cohen & Noll, 1991; Wallsten, 2000). The concept of the direct contribution of the public funds, seen in isolation from the firm’s activities enabled by other sources of capital, is commonly referred to as the grant financing’s degree of “additionality” (e.g. Rasmussen & Sørheim, 2012). A high degree of additionality (e.g. a grant proposal from a firm which has access to alternative sources of internal or external capital) should, from a “bridging the funding gap”-perspective, be negatively assessed by grant agencies. However, political, social or economic motives might incentivise grant financing agencies to “piggyback” (Lerner, 2002) on these firms’ successes, claiming a contribution to their triumphs in retrospect, although these firms might have performed just as well regardless of the public grant funds. This point addresses an important conceptual difference between grant applicants’ incentives for applying for grant financing, which could range from necessity (as for firms with no alternative sources of capital) to preference (as for firms seeking grant financing as opposed to risk capital to retain equity).

Although we have found little description of this problem statement in the literature, both sentiments were represented across our researched firms. Some firms explicitly stated that their motivations were mainly to retain equity, and that public financing was primarily a means to secure the necessary capital for continued business development with minimal dilution of the founders’ ownership. Others simply stated that public financing was the preferred option because of a lack of alternatives. Indeed, we see no reason both incentives cannot be in play

simultaneously - one can pursue public financing with more than one motivation. However, we have to acknowledge that firms find the offerings in public financing attractive, regardless of whether or not they have other alternative sources of early-stage capital available to them. Compared to a business angel investment, public financing is almost “free money”, with no strings attached apart from a few bureaucratic reporting duties. There is less dilution (or none at all), there is no shareholders agreement, and there are no new owners to take on. Even though both literature and empirical research indicates that the “funding gap” is real, and that public financing to some degree effectively targets firms that are affected by it, the above-mentioned incentives are sure to also attract a number of firms with ulterior motives to public grant competitions.

The problem is that grant administrators and expert evaluators on their side have virtually no way of distinguishing between firm-level motivations and behaviour except from the information they can extract from the written applications. As we covered in our findings section, these written applications have been expertly designed to build legitimacy and divert attention away from any serious internal weaknesses, thus closing the figurative circle of information: The evaluator can only read what has been written by the firm, and the firm will only write what the evaluator wants to see. This points to a major weakness in the screening system used in public financing, and we propose the problem is especially acute for three types of grants:

- I. Grants with single-stage screening processes
- II. Grants with low degrees of self-financing
- III. Grants with unlimited attempts

Grants with single-stage screening processes

Following our discussion point above, we propose that relying on the written application alone as the sole piece of information to base public investment decisions on is not recommended, as it makes the grant agency and expert panelists unnecessarily vulnerable to the exact exploitative behaviour that our study demonstrates. A second stage of screening, e.g. in the form of an interview, allows grant administrators to alleviate some of the challenges from informational asymmetries between the firm and the grant evaluators, and allows the expert panellists to scrutinise the logic and argumentations in the proposal more closely. This offers some more insight into the firm, including its motivations and behaviour. Although most grant programmes have adopted two-stage screening processes, presumably for this reason, there are still significant grant programs that use single-stage screening today, such as the Eurostars program.

There are multiple ways of including a second screening stage. The most common process in use by programmes like Horizon 2020's SME-Instrument and the RCN's FORNY Programmes is a combined presentation and Q&A (Question and Answer) session in front of a panel comprising industry experts, private investors and grant administration representatives. A lower-threshold mitigation effort to reduce the informational barriers between the experts and applicant firms could be to open up for communication from the expert to the firm during the peer-review screening process, opening a channel for evaluators to ask for evidence or reasoning to back up certain claims made in the written application. This would allow for a "middle-road" solution, where grant evaluators are allowed to perform additional due diligence on applicants, but without the organisational burden and cost on the part of the grant administration to arrange for formal interview processes.

Implications for grants with low degrees of self-financing

Grants with low degrees of self-financing (i.e. high degrees of public financing) is the second subset of grants which we suspect is especially vulnerable to opportunistic applicant behaviour. The lower the requirements of self-financing, the more attractive the grant will be in general, as the fraction of "free money" increases. Grants with little or no requirement for self-financing are therefore presumably extra susceptible to opportunistic behaviour from their applicants. We therefore propose that grant evaluators in grant programmes with high degrees of public funding intensity should be especially vigilant in their screening and scrutiny of applicants, maybe even considering additional screening stages or longer exposure time between applicants and evaluators to allow for more thorough due diligence. Grants in this class include the RCN's FORNY programme, PES support and IN Premarket Evaluation grant, which all have up to 100% public funding intensity.

As an important caveat to this point, 100% grant funding intensity may be justified under the right conditions, such as for very early-stage ideas in the conception stages, where NTBFs are experiencing a funding gap and therefore will struggle to secure self-financing from private investors. Our recommendation to policy-makers and grant administrators is therefore not to move away wholly from grants with 100% funding intensity, but rather to be aware that such grants are bound to lead to adverse selection effects, attracting lower-quality proposals since the self-selection mechanism of self-financing is removed.

Implications for grants with unlimited attempts

As the final subset of grants that are especially vulnerable to exploitations of informational asymmetries, we highlight grant competitions where applicants are allowed to apply for an unlimited amount of times. Grants of this type include Horizon 2020's SME Instrument, Phase 1 and Phase 2. Each time grant applicants submit an application to these programmes, they are given a full scorecard with feedback from the evaluating panel afterwards, breaking down their application and giving scored assessments of each of the judges' criteria. This provides firms with detailed information about what to improve until next time, and thus also makes the grant agency more vulnerable to proximal and cognitive legitimacy-building devices, which we have shown can be used independently of the characteristics of the underlying firm or project. This allows firms to circle in, step by step, on an optimal proposal deliverance, improving their assessment score without necessarily progressing their firm accordingly between each attempt. As a countermeasure, instead of allowing firms to apply for an unlimited number of times, grant programmes may consider limiting applicants to a fixed number of allowed attempts, after which the firm is considered disqualified from that specific programme. Numerous other grant programmes, like IN's Commercialisation grant, have limited number of allowed attempts per applicant.

As a side-comment to this last implication, there are also possible down-sides with limiting grant applicants too much in their eligible attempts. Perhaps most centrally, inter-rater reliability in peer-review processes for grant programs is famously low (e.g. Pier et al., 2018), meaning that different evaluators frequently score the same proposal texts differently. This is affirmed by *Charlie*: *"With the EU, we found it quite random at times what our score was, depending on who the evaluator was. For example, we delivered the same application two times, and got very different scores."* Similarly, professional grant proposal consultant *Golf* recalled: *"I have experienced that sections of SME-applications have been scored plus or minus two points in difference, even though I have not changed the contents of that part of the text, so that goes to show that there is always an element of randomness in the screening process."* For context, scoring in the SME-Instrument is given in three sections (Impact, Excellence and Implementation), with each section being scored between one and five points. A two-point difference in a single, unchanged section is therefore significant. Knowing that the choice of evaluator can such a big impact on a firm's chances, we hesitate to recommend too few allowed attempts per firm, as this would give too much influence to sheer luck.

Implications for Calculation of Social Gains from Grant Programmes

From our theory section, we know from Delmar & Shane (2004) that performing legitimacy-building activities like writing business plans can facilitate for firm growth. Comparing the contents of a typical business plan with a typical grant proposal template, one will quickly

realise that the two are strikingly similar. The topics in both documents typically concern the same topics, often closely aligned with Fischer's (2016) legitimacy assessment criteria like the qualities of the entrepreneurial team, technological plausibility, potential for generating public and private returns, size of target market or similar. For this reason, we would argue that Shane & Delmar's findings also should apply to the entrepreneurial activities that go into developing grant proposals, and that these activities therefore can be seen as legitimacy-building activities for the firm itself. By extension, this would mean that participating in grant competitions, regardless of success or failure, leads to firm growth for participants, and that this growth can be seen as another mechanism for generating social returns from public financing initiatives. This adds to other immeasurable mechanisms for social gains like technological spillovers (Lerner, 2002), and lends further support to the effectiveness and value of public financing, but further research would be needed to confirm this assumption.

6.1. Limitations and Avenues for Further Research

Our research has several limitations which can be explored in future research. Starting with our research methodology, our sample of NTBFs has several limitations. The first relates to the sample size, which is relatively small with four researched firms. The reason for this small sample is first of all due to a lack of willing research objects, as our analysis requires full access to grant proposal texts which contain sensitive information and intellectual property. In our reaching out to potential research subjects, we found that many firms were unwilling to participate for this reason, even given the option of anonymising data. Another reason for the small sample size is the time limitation surrounding our thesis, as each studied case requires focused, in-depth and time-consuming analysis. We therefore limited ourselves to fewer firms, opting instead for more in-depth analysis of each case.

A second limitation of our research methodology is that our sample only contains successful grant applicants and no control group of grant losers. This makes us unable to determine whether the behaviours we observed are unique to winning grant proposals. Side-by-side studies of grant winners and grant losers would be valuable to assess whether our findings are unique to successful grant proposal writers, or if similar devices and mechanisms are used also by grant losers.

We also acknowledge a significant selection bias in our sample, with three firms hailing from the Authors' extended network through the NTNU School of Entrepreneurship, and only one representative from outside of the Trondheim geographical area. Our selected firms therefore also have similar academic backgrounds and networks, which might have affected our findings and analysis. Future research along the lines of our thesis might therefore benefit

from including a wider range of geographically sourced firms, as well as firms with more varied academic and professional backgrounds.

Another limitation to our thesis is our topical context of public financing programmes, as these are both subject to frequent changes on the policy level and specific to national and regional grant agencies. This means two things: First of all, the funding programmes presented in this thesis and the way they are structured are likely to be cancelled or restructured after our time of writing this thesis, and so the relevance of our selected funding programmes is, unfortunately, inherently short-lived. However, since funding programmes are typically controlled from the government policy-level and therefore are subject to cyclical political changes, this would have been the case for any funding programme we would have chosen. Hopefully, there are enough similarities between different public grant programmes that our analysis is valid also in other geographies outside of our Norwegian and EU focus points.

Finally, there are numerous other angles which could yield valuable insights into the topic of legitimacy attainment in the context of public financing: A purely literary research approach could perhaps yield more precise findings regarding the contents of winning written grant proposals than what we could extract. Studying the effects of different signals and legitimacy-building devices on expert evaluators can also be approached from a behavioural economics or even psychological angle, with emphasis on how cognitive heuristics and biases influence the audience's impressions of grant proposal texts.

CHAPTER 7

CONCLUSION

In this thesis, we have studied the behaviour of new technology-based firms with high degrees of involvement and high success rates in the public financing system. By connecting our findings to the theoretical frameworks of information asymmetry and legitimacy, we are able to point out several findings with implications for stakeholders in public financing, both on the demand and supply sides.

Summarising our findings relating to legitimacy in public financing proposals, we find that successful proposal writers attain legitimacy for their proposals using cognitive, regulatory, normative and proximal legitimacy-building devices, with the intention that these devices are picked up by their audience, grant evaluators, as signals of legitimacy. These legitimacy-building devices are usually drawn from information about the firm and its environment, but firms also demonstrate opportunistic behaviour by exploiting conditions of information asymmetries to manipulate claims and information, knowing that the expert evaluators are limited in their ability to scrutinise claims past the information contained in the application deliverance. As long as there is a stated logic, calculation, source or other demonstration of rationale, claims are therefore effectively “protected” from initial scrutiny, as the rest is a matter of discussion at worst, and an outright positive signal at best.

Our findings point out several examples of opportunistic and exploitative behaviour in the applicant base of public grant programmes, and although these behaviours are not necessarily adverse *per se*, there are mitigating mechanisms in place which may be favourable for grant agencies to deploy, such as multi-stage screening processes, requirements of self-financing and limited attempts at submissions. Conversely, our findings suggest that grant programmes with single-staged screening processes, high public funding intensities or unlimited eligible grant submission attempts should take extra care to familiarise themselves with the potential vulnerabilities, heuristics and biases they are suspecting themselves to in their assessments.

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APPENDIX

Appendix A	Table of Content included in the appendix
Appendix B	Interview Guide NTBF Part 1
Appendix C	Interview Guide NTBF Part 2
Appendix D	Interview Guide Grant-Administrators

Appendix A

INTERVIEW GUIDE FOR NTBFs – PART 1

1. Can you tell me about your venture?
 - Did you change anything because you knew our background?
 - Would you tell it the same way to a family member?
 - Would you tell it the same way to a grant-administrator?
 - Are there any stories you like telling about your venture?
2. Walk us through your involvement in public financing programs up until today (Draw a timeline).
3. What did you do in each project?
4. What was the most/least important and impactful projects?
5. When preparing for a grant, how do you decide what to apply for?
6. How do you convince the grant-administrators that what you are proposing is doable?
7. Would you have been able to find financing elsewhere?
8. How did you convince the grant-administrators that your team was good enough to do this?
Did you ever exaggerate any of the team members competences or previous achievements?
9. Did you ever include any institutions in your applications? Why and how?
10. In your opinion, what has made you successful in grant applications?
11. Are there social benefits with the realisation of your technology? What are they?
12. Do you believe that your venture will help further technological development? How and why?
13. Do regulation, laws or industry norms play a part in your applications? How and why?
14. How is a typical grant writing/development process for you?
 - Has this changed as you have gotten better? In what way?
 - How much do you believe is about aesthetics? Do you work to make it look better?
16. Easiest and hardest part in the application to write?
17. Anything you would like to add of insights to our work on legitimacy building?
18. Have you ever applied for anything that you were not perfectly eligible for? (e.g. wrong phase/industry, etc.)
19. The best and worst thing about public financing?
20. What is your editorial process like? Do you seek external feedback?
21. How much is “cut & paste”, and how much is tailored to the specific application?

Appendix B

INTERVIEW GUIDE FOR NTBFs - PART 2 - Detailed view of the application

Walk through application and describe the rationale behind each segment.

Sample questions:

- Why did you write this? What are you trying to say here?
- What are you trying to say here?
- What would you change about this?
- Are you deliberately trying to signal anything with this?
- What are the weakest parts of this application?
- How did you strengthen those weaknesses?
- Any information deliberately left out?
- What was the feedback you received?
- Were you in the right phase? What was your confidence level?
- Do you find the selection process fair and reasonable?

Appendix C

INTERVIEW GUIDE FOR GRANT-ADMINISTRATORS

1. Can you tell me about the organization and purpose?
2. When you are organizing a screening panel, what people do you look for?
3. Do the panellists receive any form of training/preparation? What does this consist of?
4. How do you mitigate the effects of large individual differences between panellists' evaluations?
5. What are the most typical mistakes you see in applications?
6. How far into the application do you have to read to get an impression of the quality of the application?
7. What are typical signs of a good quality project?
8. What are typical signs of a poor-quality project?
9. Ambition versus realistic planning - what do you consider more important?
10. What are the main differences between the screening processes used by NFR and private investment institutions? Are these deliberate or a consequence of agency issues and organizational structures?
11. Entrepreneurs have an incentive to be opportunistic and optimistic with public funding, how critical are you generally to the assumptions that entrepreneurs make?
12. What are the strengths and weaknesses with the selection and screening process used by NFR?
13. Have you been involved in other public grant agencies' assessment processes? How are they different/similar to NFR?
14. Is there political influence on the types of projects you fund?
15. *With an application, how much do you emphasize...*
 - The team*
 - The potential for social goods*
 - The economic potential of the idea*
 - Visual impressions of the proposal (figures, design, graphs, spacing, etc.)*
 - Language*
16. Compared to foreign companies, what are the strengths and weaknesses of Norwegian NTBFs in the public financing context?
17. Between "filling the funding gap" and "investing in societally profitable projects", what do you feel is the more important mandate for your agency or programme? Why? Is this a personal opinion or a common one?
18. Are you aware of professional grant proposal writers? What are your thoughts on them?
19. Can you tell if a proposal has been written by a professional?

