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Tick-Tock Goes the Biological Clock: Challenges Facing Elite Scandinavian Mother-Athletes
Callerstig, A.-C., Lindvert, M., Ljunggren, E. C., Breivik-Meyer, M., Alsos, G. A. & Balkmar, D.

Contextualizing Gender Policy in Tech Entrepreneurship:
A Cross National and Multiple-Level Analysis

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**Contextualizing Gender Policy in Tech Entrepreneurship:
A Cross National and Multiple-Level Analysis**

Abstract

Purpose
In order to address the gender divide in technology entrepreneurship, we explore *how different national contexts impact policies and policy implementation.* We investigate how transnational concerns (macro level) about women's low participation in (technology) entrepreneurship are translated and implemented among actors at the meso level (technology incubators) and understood at the micro level (women tech entrepreneurs).

Design/methodology/approach
We adopt gender institutionalism as a theoretical lens to understand what happens in the implementation of gender equality goals in technology entrepreneurship policy. We apply Gains and Lowndes' (2014) conceptual framework to investigate the gendered character and effects of institutional formation. Four countries represent different levels of gender equality: high (Norway & Sweden), medium (Ireland) and low (Israel). An initial policy document analysis provide the macro-level understanding (Heilbrunn et al., 2022). At the meso level, managers of technology business incubators (n=3-5) in each country were interviewed. At the micro level, 10 female technology entrepreneurs in each country were interviewed. We use an inductive research approach, combined with thematic analysis.

Findings
Policies differ across the four countries, ranging from women-centred approaches to gender mainstreaming. Macro-level policies are interpreted and implemented in different ways among actors at the meso level, who tend to act in line with given national policies. Actors at the micro level often understand gender equality in ways that reflect their national policies. However, women in all four countries share similar struggles with work-life balance and gendered expectations in relation to family responsibilities.

Introduction

Despite increasing numbers of appropriately qualified women within the tech field, relatively few become tech entrepreneurs (Marlow and McAdam, 2015). The low number of women entrepreneurs in general, and in technology sectors in particular, is a global concern. For instance, the UN asks the global community to act on structural gender inequalities resulting in unequal access to infrastructure, productive resources and procurement opportunities, which impact the ability for women to be active players in the economic field (UN Women, 2021). The European Institute for Gender Equality (EIGE) in the European Union (EU) has pointed to the crucial role of entrepreneurship for Europe's economic growth. EIGE emphasizes the need to address the "gendered challenges" many women in entrepreneurship face (EIGE, 2022). Technology is in itself highly gendered, which impacts both the (low) number of patents filed by women (WIPO, 2021) and the (low) number of women tech entrepreneurs. There is a strong pervading and seemingly universal male norm relating to technology professions and entrepreneurship (Mellström, *et al*.,2023). At the same time, the tech industry is a dynamic and growing area characterized by transformation spurred by technological advances, rapid digitalisation and environmental concerns. The tech industry has a high and growing demand for skilled professionals and talent, and provides new areas for job and business creation in the years to come. For this reason, the possibility that women will be left behind is a growing concern.

On the national level, many countries have implemented specific gender objectives and policy measures for a number of decades to increase the number of women entrepreneurs in the tech sector. However, the results are disappointing even in countries that perform well in international gender equality indices, such as the Nordic countries. In spite of strong welfare state ideologies, good universal childcare and dual-earner family models, the Scandinavian countries have a low proportion of women entrepreneurs, particularly in the tech sector. To add to the puzzle, countries that perform low on gender equality (GE) indices, with no universal childcare services and a strong male bread-winner family model, seem to perform as well (or as poorly) as the Nordic countries. Little is known about how variations in context , historically rooted gender roles and attitudes towards gender equality impact the efficiency and implementation of gender equality objectives and policy measures in entrepreneurship. These issues are widely under-researched (Welter, 2019).

The aim of this paper is to investigate how gendered contexts impact the implementation of policies aiming to address the gender divide in technology entrepreneurship. More specifically, we ask: *In what ways do gendered contexts impact how gender policies are implemented in tech entrepreneurship?,* and, *How do gendered actors affect the implementation of gender equality policies?*

These research questions are addressed by comparing the implementation of GE policies in four countries at the macro, meso and micro levels of the technology entrepreneurship system. Our research aim is related to the larger question of how transnational concerns about women's participation in entrepreneurship are being translated in ways that are meaningful and usable by local actors in national contexts. Technology entrepreneurship is a particularly suitable object of study as the field has strongly articulated the need to address gender equality policy issues on a global scale.

The countries selected for the study all have long-standing efforts to close the gender gap. They offer good conditions to make macro-level comparisons of gendered contexts with both common features and intriguing differences on the macro level. To study the meso level, we chose a particular materialization of technology-promotion policies: technology business incubators (TBIs) and their employees. Technology incubators can play a pivotal role in advancing gender equality and the inclusion of women entrepreneurs. However, they can also contribute to the creation or reproduction of gender inequalities in various ways. Incubators may be the most pronounced means to support technology entrepreneurs, as they often have access to economic funding and provide know-how, thus acting as gatekeepers for aspiring entrepreneurs. We focus on the actors within the incubators, both managers and coaches, and their role in the operationalisation of gender objectives and policies in their daily work. To gain

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insight at the micro level, we focus on the tenants (the tech entrepreneurs). Entrepreneurs play an important role in maintaining or challenging gender stereotypes. We investigate how gender objectives are negotiated and put into practice in technology incubators by the actors that inhabit them.

Incubators are also a particularly interesting arena to study as they lie at the intersection of different institutional levels. We want to understand how incubator actors respond to and enact gender equality objectives and policies within the institutional framing in which they operate and how this can explain both similarities and differences in outcomes between the countries studied.

We apply gendered institutionalism as our theoretical framework. This enables us to pay special attention to how gendered notions of institutions and actors are mutually constitutive and affect the overall outcome of GE policies in technology entrepreneurship. The starting point is the policy implementation process and how it is affected by institutional contexts (at macro and meso levels), as well as how implementation is visible, particularly in the choices made by actors operating within the institutions at the micro level (Levitt and Merry, 2009; Ahrens and Callerstig, 2017; Gains and Lowndes, 2014). The paper contributes to entrepreneurship theory by applying gendered institutionalism to the field of technology entrepreneurship and by showing how a gendered understanding of context provides insight into the factors that impact the implementation of GE policies.

Theoretical framework

Institutional contexts

Context matters for entrepreneurship (Welter, 2011, 2019), and may help explain differences in entrepreneurial endeavours across countries (e.g. GEM, 2023), organizations, and groups of individuals. Context is a determinant for understanding conditions at different parts and levels of entrepreneurship. It can refer to macro level aspects, such as national policies and regulations; meso level conditions, such as organizational culture in TBIs; and operating procedures. At the micro level, context can relate to personal prerequisites, previous experiences, personal networks and educational attainment. Gender is an intrinsic factor of context and shapes the "who", "where" and "when" of entrepreneurship (Welter, 2011, 2019). Applying a gender lens to context, i.e., analysing how context is gendered and has gendered impacts, provides better insight into how and why women enter or leave entrepreneurial endeavours and how they develop their businesses. We understand context as the institutional environments that entrepreneurs operate within, "comprised of regulative, normative and culture-cognitive elements that, together with associated activities and resources, provide stability and meaning to social life" (Scott, 2008, p. 48). Hence, institutions are fundamental elements of entrepreneurship. Institutions provide the rules of the game, guiding the behaviour of actors and organisations (March and Olsen, 1984). To analyse how gender equality objectives and policies in technology entrepreneurship are shaped by actors, gendered institutionalism (Mackay et al., 2010) provides a theoretical lens that enables us to understand how and why gender equality goals are adopted (or not). Gendered Institutionalism (GI) builds on the claim made in new institutionalism, that "the organisation of political life makes a difference" (March and Olsen, 1984). GI in particular seeks to investigate how the gendered aspects of organizations make a difference (Gains and Lowndes, 2014). GI can help create an understanding of differences in how, and if, "rules in form" become "rules in use" (Ostrom, 1999, p. 38). GI provides an analytical lens through which the co-construction of rules, norms and policies at the macro, meso and micro levels can be studied, and it helps create an understanding of not only how institutions affect entrepreneurship at a particular point in time, but also how institutions change over time. To understand the gendered "rules of the game" in technology entrepreneurship and its various macro, meso and micro environments, we will discuss elements that are likely to have an impact on how gender policy concerns are articulated and implemented in local contexts.

Technology entrepreneurship

The particular focus in this study is the intersection of two dominant institutions: entrepreneurship and technology, both with strong gendered norms (Balkmar, 2012; Balkmar and Mellström, 2018). Both entrepreneurial and technology discourses are rooted in masculinity and thus privilege men and masculinity as the norm (Marlow and Martinez Dy, 2018; Ahl, 2006; Bruni *et al*., 2004), which affects gender formations and the behaviour of organisations and individual actors in the area (Lohan and Faulkner, 2004). Implicit norms of who is suitable as a tech entrepreneur form a strong normative institutional context that is embedded in every step of the entrepreneurial process, from the idea phase to the growth phase (Mellström, *et al.,* 2023). The highly gendered ideals of heroism, competitiveness and devotion characterize the widely held image of the tech entrepreneur, which is embodied in white Anglo-Saxon men such as Elon Musk and Bill Gates, and these ideals are reproduced on a global scale. The ideals have been found to affect the conditions of both those that adhere to this norm and those that do not. Efforts have been made to close the gender gap in entrepreneurship. In general, earlier policy examinations point to a strong underlying assumption that entrepreneurship is a fundamentally male domain, a norm that women have to adjust to (Ahl, 2006; Marlow, 2015; Ahl and Nelson, 2015; Pettersson, *et al*., 2017; Harrison, *et al*., 2020). This assumption leads to an approach where women are 'helped' to overcome different barriers in what is known as a 'fix the women' approach that many governments have adopted (Henry *et al*., 2017). Following this approach, policies often include measures to train and educate women to better compete in a "man's world", and the policies are regarded as the solution for female entrepreneurial underperformance rather that scrutinizing the underlying and taken-for-granted gender norms (Marlow and McAdam, 2013; Ahl and Marlow, 2012).

Gender regimes

Gendered national policy contexts are both formal and informal, as well as explicitly gendered or have gendered effects. They have been described as societal *gender regimes* (Sainsbury, 1999, 2011). Gender regimes are formed in line with historically and culturally embedded societal gender norms and ideologies, which will impact women and men entrepreneurs differently. Sainsbury (1999, 2011) describes how gender regimes are fundamental in creating and upholding gender roles and gendered power relations. They shape people's lives in a multitude of ways and include gendered values, norms and rules. Gender regimes are strongly influencing the way policies are shaped. They play a particularly significant role in policies that have a large impact on gender roles in relation to paid work and family responsibilities (ibid). In most countries, women take on more family responsibilities than their male partners (Oláh *et al*., 2018). Therefore, the institutional environment in the form of a country's family benefit system influences women's engagement and participation in entrepreneurship activities (McAdam, 2013, 2022). Other influential contextual aspects concern the gendered characteristics of labour market policies, as well as regulations that control access to relevant education opportunities, business ownership and financial capital (Foss *et al*., 2019; Alsos *et al*., 2011). Generally speaking, gender regimes affect attitudes towards work and family, such as the difference between what has been called the individual model and the family breadwinner model. The individual model encourages women and men to share family and work duties equally. Here, the government has a substantial role in providing support, such as childcare, and social benefits are based on individuals, not families. The family breadwinner model is based on the notion that men are the family breadwinners. It adheres to a strict gendered division of labour, with different roles and tasks for women and men and unequal access to social benefits. Gender regimes explain particular features of gendered policies in different countries. They are to a large degree co-dependent, where one policy can have implications for several types of organisations and policy sectors (Sainsbury, 1999, 2011; Ahrens and Callerstig, 2017).

Organisations can themselves be understood as institutions, yet they also exist within institutional contexts that impact them in different ways. One example is how institutional pressures can manifest as regulatory demands on organisations, such as the demand to establish a gender equality plan or to carry out gender mainstreaming. The collective norms,

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routines and practices of institutions affect how individuals behave, where actors in similar situations act in similar ways due to their shared frame of reference (Lang, 2023, p.1). Decades of research has convincingly shown that gender is a fundamental element of organisational structure and is visible in the processes, practices, images and ideologies of an organisation, as well as in the distribution of power (Acker, 1992, p. 567). Organisations are embedded in different gendered institutions, such as overarching gender regimes and gendered norms in different occupations and sectors, what has been called the "deep structures of organisations" (Rao and Kelleher, 2005). Gender regimes on the organisational level are often visible in who has power and control over goals, resources and outcomes. Furthermore, gender regimes are revealed by who is deemed worthy of respect, through work relationships, and through salary and other monetary rewards, and are upheld by organisational actors on a daily basis (Acker, 2006).

Despite the fact that organizations are gendered, the underlying assumption is that incubators represent a neutral support mechanism (Marlow and McAdam, 2012; 2015). Earlier research has shown that actors within incubators, both managers and tenants, adhere to, negotiate and resist gendered ideals associated with entrepreneurship, for instance, ideals dictating how to dress and act in accordance with dominant cultures and, for women, to 'blend in' (Levi, 2006). In general, the implementation of gender equality policies in different entrepreneurship settings has been found to be difficult (Kvidal and Ljunggren, 2014). In particular, gender equality work is seldom prioritized and is largely driven by actors who lack the mandate to make meaningful changes, not by management. Gender equality work also lacks a clear structure and resources, and is often carried out in more short-lived project forms (ibid.). Another common feature is a general lack of gender awareness and know-how in terms of the implementation of the strategy, which creates disinterest and low commitment to gender equality goals in many organisations (Callerstig, 2014; Engeli and Mazur, 2018).

A framework to understand the impact of gendered contexts of policy implementation
In order to investigate how and why new GE policy goals are adopted (or not adopted), Gains and Lowndes (2014) provide a conceptual framework for understanding the gendered character, and thus the effects, of institutional formation with a typology that includes four sets of variables: *1) Rules about gender*, i.e. "rules that specify and allocate particular roles, actions, or benefits for women and men" (Gains and Lowndes, 2014 p.527). These rules include gender equality policies in general and in the case of entrepreneurship, legal gender frameworks, etc. *2) Rules that have gendered effects*, i.e. "rules that are not specifically about gender but that have gendered effects" (ibid. p.528). For instance, when meetings in incubators are held during evenings, certain groups of TBI tenants are excluded (parents with small children, especially women). Informal rules may also relate to the ideal entrepreneur or tech expertise. *3) Gendered Actors Working with Rules,* i.e. understanding how institutions and actors are mutually constitutive, "focusing on the agency involved in institutional creation, maintenance, and disruption" (ibid. p.529). This incorporates an understanding of how actors and actions are gendered in various ways. This is a key to understand the interaction between actors and institutional rules and involves actors working both individually and collectively, as well as across institutional boundaries (ibid.). *4) Gendered Outcomes of Action Shaped by Rules* involves discussions about how and why outcomes are "good or bad from a gender perspective, in what way and for whom" (Gains and Lowndes, 2014 p.529). In order to achieve the desired effects of specific gender objectives, there also needs to be an investigation of "the capacity of institutional design to make gender equality commitments stick'" (ibid, p.530).

The model presented in Figure 1 is adapted from the framework by Gains and Lowndes (2014) and used as point of departure in our analysis.
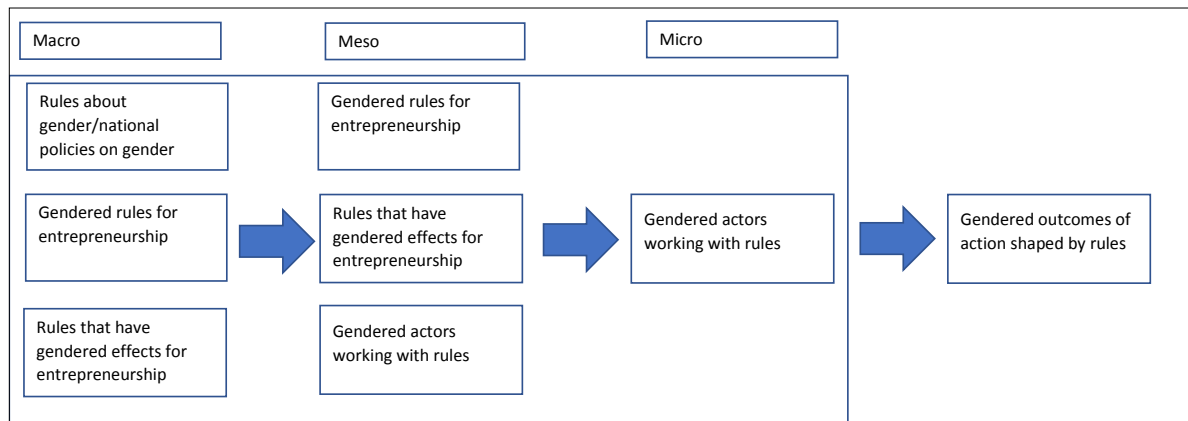
Figure 1. Analytical framework (adapted from Gains and Lowndes, 2014)

Methods and data

Data collection

In order to gain an in-depth understanding of how gender policies are understood, implemented and reflected on in the four countries, we use a qualitative research approach which includes several steps of data collection and analysis and follows the theoretical framework applied in the study (Gains and Lowndes, 2014). The different steps are presented below.

Macro level: First, we gathered country data related to gender equality to gain an overall description of the four countries (see Table 1 and the first section in the findings about the macro level). Then, we conducted a thorough analysis of the policies implemented in each country to create a macro-level understanding of gender-related issues for entrepreneurship. The data was gathered primarily through various websites, which contained information on the national programs, reports and action plans for entrepreneurship. For a full account of the documents used, see Heilbrunn *et al*., (2020).

Meso-level: Second, we collected data from all of the webpages of incubators in the four countries. All TBIs are wholly or partly owned by public agencies. Out of the total number of incubators, we identified the number of incubators with a tech focus (total number of incubators) as follows: Norway, 26(34); Sweden, 28(40+); Ireland, 15(30); and Israel, 50+(50+). We specifically searched for information regarding gender, such as programs or networks that exclusively target women or that explicitly address the gender divide within tech entrepreneurship. We further investigated the proportion of women in leading positions at the incubators and on the incubator boards (see Heilbrunn *et al*., 2020 for an account). To gain a deeper understanding of what role key actors within the incubators play, the next step was to conduct interviews. A total of 3-5 incubator managers in each country (17 in total) were interviewed about gender policies and the measures they take to increase the number of women in TBIs (McAdam, *et al.,* 2022).

Micro-level: Third, in order to obtain an in-depth understanding of how actors at the micro level understand and reflect on GE policies, we conducted interviews with 10 female technology entrepreneurs in each country (In total 40), all of whom were tenants of a TBI. The majority were at the early- or early-growth stage and in the process of acquiring capital. They were asked to reflect on their lived experiences as women technology entrepreneurs in incubation, on gender-related preconditions in their countries and on explicit or implicit factors promoting or hindering women tech entrepreneurs.

Interviews were semi-structured. The same interview guides were used in all countries; one for incubator managers and one for entrepreneurs. The semi-structure of the interviews left room for reflection and follow-up questions (Miles and Huberman, 1994). Interviews lasted

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approximately one hour each and were held at the TBI facilities or via Zoom (due to Covid-19 restrictions). All interviews were recorded, transcribed, anonymized and translated into English.

Decisions in the data collection on all three levels, including how many data points that are sufficient to fulfil the purpose of the analysis, has been based on our in-depth contextual and theoretical knowledge. The number of data entries outlined have not been guided by attempts to predict a specific point of 'data saturation' (Braun and Clarke, 2021 p. 205). Instead, our approach was based on the idea that meaning is not inherent, but *generated*, through interpretation of the interview data (Ibid., 2021 p. 210).

An interpretive approach was used to analyse data from the interviews. Drawing on Braun and Clarke (2006 p. 79), we conducted a thematic analysis, described as a method for "identifying, analysing and reporting patterns (themes) within data". NVivo R1 was used as a tool to systematically organise and code all data. At this stage, researchers from the different countries coded the data from their own countries. The initial codes were thereafter sorted into themes, identified across the data. The relationship between codes, between themes and between different levels of themes were discussed among the whole research group and themes were later reviewed, defined and refined. All authors met on several occasions to discuss and agree on the overall coding structure in NVivo R1. This process was crucial in order to validate cross-country comparisons and to make it possible to identify similarities and differences between the four countries. Lastly, themes were discussed in light of previous literature, and analysed in relation to our research questions (Braun and Clarke, 2006).

Case description

In the Global Gender Gap Report, countries are ranked based on gender equality in several core domains, including work, money, knowledge, time, power and health (WEF, 2022). Based on this ranking, four countries were theoretically sampled to secure the representation of high (Norway and Sweden), medium (Ireland) and low (Israel) gender equality countries. Table 1 presents a description of the case countries. Norway and Sweden are considered to be 'women-friendly' states that 'would not force harder choices on women than on men or permit unjust treatment on the basis of sex' (Hernes, 1987 p.15). Ireland is ranked 9th in the report, whereas Israel is ranked 60th.

Sweden and Ireland are EU members and are thus compelled by EU policy to implement the dual approach, that is, to implement gender equality objectives in specific targeted initiatives and introduce the more generic strategy of gender mainstreaming (integrating a gender equality perspective in all policy areas). Norway and Israel are non-EU members and are therefore not under the same pressure to implement policies from an 'over-governmental' level. However, all four countries are UN members, and thus obliged to promote the 17 Sustainable Development Goals (SDG), where gender equality is an explicit goal (SDG 5) (UNDP, 2022).

Table 1: Country Data Related to Gender Issues (Table adapted from Heilbrunn et al. 2020)

	Norway	Sweden	Ireland	Israel
Gender Inequality Index (2022) rank of 146	3	5	9	60
Women's Labour Force Participation (2018)	60.4%	61.4%	56%	59.7%
Share of Women in Parliament (2019)	40.8%	47.1%	24.3%	23.3%
Gender Wage Gap	7.1%	7.3%	5.9%	21.8%
Female science, technology, engineering and mathematics (STEM) Graduates	19.3%	22.4%	24.8%	24.8%
Proportion of Women engaged in Early stage Entrepreneurship Global Entrepreneurship Monitor (GEM 2019)	5.1%	4.0%	7.5%	9.1%
Share of Women Investors (2017)	9.0%	7.3%	9.6%	12.2%

Women in High-Tech Sector	19.4%	20.8%	18.9%	11.0 %
Parental leave related issues				
Length of parental/maternity leave	49–59 weeks* parental leave	68 weeks* parental leave	26 weeks maternity leave	15 weeks maternity leave
Financial support during parental/ maternity leave	80% of salary (59 weeks) or 100% salary (49 weeks)	80% of previous income 6 month before birth	Maternity Benefit	The same income as before giving birth
State subsidised child-care facilities from age	9-14 months	1 year	2.8 years	3 years

*In Norway and Sweden, there is a strong emphasis on sharing parental leave. In Norway, 16-19 weeks and in Sweden 13 weeks (90 days) are reserved for each parent. All days, except days reserved exclusively for each parent, can be transferred to the other parent.

Findings

In the following, our empirical findings are presented in relation to the analytical model presented in Figure 1. First, the four countries are presented with a focus on gender equality, gender regimes and rules about gender within the different countries. Second, gendered rules and rules that have gendered effects for entrepreneurship at the macro level are presented, followed by findings on how these policies are implemented at the meso level by technology business incubators (TBIs). Lastly, we look at how women technology entrepreneurs understand and reflect on these policies at the micro level.

Macro level – Gender equality, gender regimes and rules about gender

As described earlier in the theory section, the four countries in the study adhere to different gender models (individual gender model or the family breadwinner model), which has implications for macro level policies. Therefore, "Rules about gender" (national policies on gender) also differ between the four countries, especially the length and framing of parental leave and how childcare is organized. In the Scandinavian countries, it is referred to as 'parental leave', and fathers are expected to take at least part of the leave (if not 50%). In Ireland, in contrast, it is referred to as 'maternity benefit', implying that it is mothers who are expected to take full responsibility for childcare. Further, the Scandinavian welfare model creates a type of childcare that is highly subsidized and available for all. In Ireland, and even more so in Israel, childcare is expensive and not always available.

In summary, Norway and Sweden have many features of the so-called individual regime, and Ireland and Israel mainly resemble the family breadwinner model.

Macro-level – gendered rules and rules that have gendered effects for entrepreneurship

All countries in this study have dedicated public innovation agencies: *Innovation Norway*, Sweden's *Vinnova, Enterprise Ireland* and the *Israel Innovation Authority*. These are public, governmental flagship organisations aimed at promoting entrepreneurship and innovation as part of a national strategy. In the following, we present the gender-related entrepreneurship policies in the four countries. This is referred to as "Gendered rules for entrepreneurship".

Norway: Norwegian policymakers and bureaucratic institutions have moved toward gender mainstreaming, and the programmes targeting women entrepreneurs have been wound down. Gender equality considerations are to be integrated in all measures and policies, following a gender mainstreaming strategy. Interestingly, a gender quota of 40% was set for the start-up grants offered by *Innovation Norway* in 1999. At the time, the proportion of grants granted to women was 20-30%. Already in 2000, the 40% goal was met (Alsos et al., 2006), and similar targets were set for other support schemes. However, from 2014, the Government removed all gender targets for support schemes offered by Innovation Norway, resulting in a reduction in the proportion of support granted to women. The proportion of start-up grants allocated to women was reduced from 42% in 2013 to 14% in 2018 (Action Plan for Female

Entrepreneurship, 2019). Similar reductions were also found for other measures. Currently, Innovation Norway has a programme for '*Growth for women and diversity*', which aims to contribute to increased value creation and innovation by promoting the participation of women and minorities and strengthening their position in entrepreneurship and businesses. Another agency, *Siva,* the governmental agency involved in incubators, has a goal that 40% of the entrepreneurs in the incubators they support should be women, however currently they have no programmes or action plans to promote this goal. Still, supported incubators must report the number of female entrepreneurs in the incubator, which provides a week incentive for incubator managers. Finally, as member of Horizon Europe, Norway alongside Sweden and Ireland, take part of Women TechEU, a support scheme offering coaching and mentoring, and targeted funding to female technology entrepreneurs to help take their business to the next level, as well as of EIC Women Leadership Programme, a skills enhancement and networking programme for women researchers and entrepreneurs who have received EU funding. In Norway, these schemes are promoted by Innovation Norway.

Sweden: In Sweden, there used to be a national 'women-only' programme called '*Promoting Women's Entrepreneurship*' (2007–2010, 2011–2014). The program aimed to encourage women to start and grow their own firms, and to develop a national strategy for gender equality for business promotion, in collaboration with business promotion actors and authorities. The three target groups of the programme were: 1) Women who wanted to expand their business; women who wanted to start their own business; women who wanted to develop innovative ideas, 2) regional institutional actors promoting and developing businesses, and 3) the public, media or other actors interested in information about female entrepreneurship. Additionally, Sweden had a foreign-born female entrepreneurship programme, which primarily promoted the development of small and medium-sized business. After 2014, Sweden's national strategy changed to a broader, more integrated approach. "Open up! A National Strategy for Business Promotion on Equal Terms 2015-2020" is an example. In this strategy, the focus on women is replaced with a focus on equal conditions for all, including gender, ethnicity and age. Several government agencies that support innovation and entrepreneurship now adhere to the idea of "intersectional gender", meaning that gender cannot be understood in isolation but must be addressed together with other factors such as ethnicity, age, disabilities, etc. This perspective is also supported by recent government investigations and policy actors, such as the Swedish Gender Equality Agency. The strong emphasis on both intersectionality and gender mainstreaming has resulted in the inclusion of gender and diversity objectives in mainstream growth and innovation policy.

Ireland: *Enterprise Ireland* established a *Female Entrepreneurship Unit* to address the under-representation of women entrepreneurs. The unit's purpose is to encourage ambitious women entrepreneurs to launch and grow high-potential start-ups, while addressing the key challenges facing women in this domain. The unit has developed a number of support systems specifically tailored for female entrepreneurs, such as competitive funds to support female-led business teams, the identification and promotion of role models, the sponsorship of events, awards and support to networks. These initiatives emerged from research highlighting the unique obstacles faced by women in start-ups. Furthermore, a key component of Enterprise Ireland's strategy is to work to achieve a better gender balance in the sectors manufacturing, information, and communications technology (ICT), engineering and construction. The aim is to increase the number of women-led companies with international growth potential by increasing the proportion of women in management roles, the number of women engaged in entrepreneurship in general, and the number of women-led High Potential Start-Ups. In addition, Enterprise Ireland aims to make ambitious structural reforms to the local Irish support ecosystem. By 2025, the aim is to increase the number of women-led companies with international growth potential by 100%.

Israel: The *Israel Innovation Authority* initiated an *Incentive Programme for Female-Led Start-ups* in 2019 with the aim to increase the number of female entrepreneurs in the Israeli

innovation ecosystem and thereby narrow the gender gap. In this program, women-led start-ups (at least 33% ownership by women, and women in a managerial or technological role) are eligible for research and development grants of up to 75% of the company's R&D funding the first year, and 70% in the second year of the programme. Further, the Innovation Authority launched a support programme dedicated to women entrepreneurs with early-stage companies to enable access to all of their support tools. Israel also has programmes that support women-led companies in promoting innovative technological projects and raising capital from private investors.

In summary; the findings reveal that in all the countries included in the study, traditional gender norms push women and men to operate within different sectors, making the high tech sector be dominated by men (Table 1). There are no formal obstacles for women in any of the countries. Hence, the push to different sectors is guided by informal rules about what makes a good technology entrepreneur that are embedded within the four country contexts. The informal rules indicate that a good technology entrepreneur is masculine. This is indicated by programs addressing the gender gap in technology or in entrepreneurship by targeting women to help them 'meet the standards'. These informal rules can be categorized as "Rules that have gendered effects for entrepreneurship".

More specifically, policy makers in Ireland and Israel are working to narrow the gender gap and increase the number of female entrepreneurs by offering dedicated women-focused entrepreneurship programs targeting high-tech start-ups. In contrast, Norwegian and Swedish policies have moved towards gender mainstreaming, and the majority of specific programs promoting women entrepreneurship have been wound down. The few dedicated programs that remain, focus mainly on opening up opportunities, especially for minority and migrant women. Neither the women-focused programs nor the mainstreaming address the underlying masculine understanding of technology entrepreneurship. As far as "Rules that have gendered effects for entrepreneurship", all of the countries see the typical technology entrepreneur as male, and the female tech entrepreneur as the deviation.

Meso level – implementation of policies among incubators
Incubator managers in Norway and Sweden recognize that there is a prevailing gender gap, and they argue that the proportion of women tenants needs to increase. However, in line with the national policies, the Scandinavian incubators put no, or very little emphasis on women-only initiatives and focus on gender mainstreaming and inclusion in a broader sense. In Ireland and Israel, on the other hand, there are several initiatives at the meso level specifically targeting women entrepreneurs. In Ireland, around half of all incubators (tech- and non-tech) have some form of female-only programs. Similarly, Israel has several initiatives targeting women, with some incubators offering facilities where female tenants can breastfeed their babies, i.e. supporting women entrepreneurs who bring children to the incubators. This is in stark contrast to the Scandinavian countries, where public childcare is cheap and available to everyone.

In general, the incubator managers expressed that they want more women to apply for the incubator programs, and some have taken steps to encourage this by 1) making female entrepreneurs visible as role models, and 2) using inclusive communication with potential tenants. As one of the Irish incubator managers explained, "The way we communicate is inclusive, including the type of language we use on marketing and promotional materials - it is not masculine in its nature". Another aspect that one incubator manager in Norway brought up was the importance of having women in the incubator staff and management. They were taking active measures to increase the proportion of female tenants by including more women among their staff, board members and in their investor network under the motto 'show, don't tell'.

A central aspect of the incubators' work is the tenant selection process. This may be formal, informal or a combination of both. Israeli incubators appears to have the most formal selection procedures, where incubator managers are looking for high-quality start-ups that can excel quickly and internationalise at a rapid pace. In the Scandinavian countries, incubators generally undertake formal selection processes, with an application scoring system and

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interview panels. The Irish incubators have a mixture of formal and informal processes, where the incubator manager may have an informal influence in the selection process. Incubators in Sweden, Norway and Ireland strive for gender-mixed interview panels, to varying degrees, in order to promote a better gender balance among tenants. However, none explicitly use gender as a selection criterion. On the other hand, one of the Israeli incubator managers expressed that a start-up needs a person with a strong technological background, capability to present an idea, be highly motivated and willing to take personal risks. This description arguably depicts a man capable of performing tech masculinity. Incubators may increase the participation of women entrepreneurs through the provision of a space that is welcoming for women. Data from Ireland suggests that the environment of the incubator, such as its "openness", "friendliness" and "inclusiveness" may influence the incubators gender distribution: "Maybe the environment that [local incubator] creates, which is, kind of, open plan, open innovation, collaborative, collegiate, very much focused on lifestyle and wellbeing and friendliness…That really does seem to be a critical factor in terms of accommodating and driving and fostering female entrepreneurship." (incubator manager, Ireland). The data also show that the incubators differ in terms of flexibility regarding family obligations. Some incubators are indifferent to the need to leave work after office hours, while others are flexible and try to schedule meetings during ordinary office hours. This is especially true in Sweden and Norway, where incubators are relatively strict on keeping events within office hours. On the other hand, some incubators, especially some of the Scandinavian incubators, were described as being "boy's clubs", which is indicative of implicit discrimination. As one of the female Norwegian entrepreneurs explained: "Men would just choose men for their co-founders because then they can play afterwork PlayStation […] they understand each other at a different level." There was also evidence in Israel and Ireland that echoes the view that supporting women entrepreneurs means teaching them to behave like their male counterparts. This is referred to as "Rules that have gendered effects for entrepreneurship".

In summary, the incubator managers express that there is an under-representation of women within incubators and that they want to change this. However, if and how they actually take measures to improve the gender balance differ between. This is referred to as "Gendered rules for entrepreneurship". Israel and Ireland have programs targeting women, while the Scandinavian incubators focus on gender mainstreaming. None of the incubators in this study use gender as a criterion in the selection process. Within the four countries, the incubators differ in their focus on activities to promote women involvement, such as promoting female role models, while striving for gender-mixed interview panels, a gender-mixed incubator staff, and an inclusive environment.

Micro level – how policies are understood among women tech entrepreneurs
In all four countries, the "typical technology entrepreneur" is male, which has certain implications for female entrepreneurs. Women within incubators perform masculinity by adopting male gestures and dressing to fit in: "I always talk about numbers now, because I know that people... they like numbers...I've also become maybe to some extent more of that stereotypically... manly sort of character where I want to dress in a certain way because I want to feel like I have power." (Female entrepreneur, Sweden). Women also encounter inappropriate comments about their femininity and physical appearance, gender discrimination, sexism and not being taken seriously. Female entrepreneurs in Israel and Sweden, in particular, expressed that there are higher expectations for women than for men and that they need to prove themselves more than their male counterparts. One of the female Swedish entrepreneurs expressed: "I think certainly you have an advantage [as a male], especially in technology that you are perceived as [normal]…That men can be hackers, they have this sort of [uncontested identity]…Whereas as a woman, you have to maybe prove more, you have to demonstrate that you actually have some competence in technology, whereas as a more stereotypical man, we have these implicit perceptions". In addition, female entrepreneurs in Norway expressed that gender inequality is often implicit, unintentional and difficult to identify.

Female entrepreneurs in all four countries struggle with work/life balance and experience the same expectations and pressures regarding family obligations. Therefore,

several female entrepreneurs find it difficult to attend meetings in the evening. A strong theme that emerged in the data from Ireland and Israel is the difficulty caused by a lack of access to childcare and the obstacles this creates in the start-up process. This theme did not emerge in the data from Norway and Sweden, as these countries offer public childcare. This is where we found the strongest difference between the countries, showing that national (family) policies have a direct effect on the conditions for women entrepreneurs.

Another interesting difference between the countries is related to where women 'place' the problem. In the Scandinavian countries, female entrepreneurs generally showed a negative view of women-only initiatives. They do not want to be put in a 'B-team' or victimized. They want to be seen as equal to male entrepreneurs, and deny initiatives that portray women as different, and thereby inferior to men. When asked about solutions, they most frequently argued that changes have to come in early socialization processes, in daycare and schools, where role models and fields of interests are introduced. In contrast to this perspective, we find that women tech entrepreneurs in Ireland and Israel hold a positive view of action plans and initiatives with a women-only approach: "I think we need a bit of support there. I think we need a bit of coming together, so that we are stronger. Not to fight against something else [men], but just that we are there, confident and strong." (Female entrepreneur, Ireland). Though several of the respondents in these countries also argued that gender inequality stems from societal norms, they believe that women-only initiatives are beneficial and a step towards a more inclusive society.

In summary, our empirical evidence suggests that female founders, to varying degrees, engage in processes of reflections; they reflected on how gender shape and, in some cases, differentiate their experiences of technology incubation. An overview of our main findings is presented in Table 2.

Table 2: Overview of Empirical Findings

		Overall policies from UN			
			Overall policies from EU		
		Norway	**Sweden**	**Ireland**	**Israel**
Macro level	**Rules about gender**	Individual gender model	Individual gender model	The family breadwinner model	The family breadwinner model
	Gendered rules for entrepreneurship	Moved towards mainstreaming gender: The majority of specific programs fostering women entrepreneurship are terminated	Moved towards mainstreaming gender: The majority of specific programs fostering women entrepreneurship are terminated	Dedicated women-focused entrepreneurship programs	Dedicated women-focused entrepreneurship programs
	Rules that have gendered effects for entrepreneurship	The typical technology entrepreneur is male	The typical technology entrepreneur is male	The typical technology entrepreneur is male	The typical technology entrepreneur is male
Meso level	**Gendered rules for entrepreneurship**	No women-only initiatives	Few or no women-only initiatives	18 of 30 incubators have women-only programs/activities	Several women-only initiatives
	Rules that have gendered effects for entrepreneurship	The typical technology entrepreneur is male	The typical technology entrepreneur is male	The typical technology entrepreneur is male	The typical technology entrepreneur is male
	Gendered actors	If and how the incubators work to	If and how the incubators work to	If and how the incubators work to	If and how the incubators work

	working with rules	improve the gender balance differs	improve the gender balance differs	improve the gender balance differs	to improve the gender balance differs
Micro level	**Gendered actors working with rules**	Women-only programs seen as negative Early socialization processes need to change Strongly masculinized norm about the ideal technology entrepreneur	Women-only programs seen as negative. Early socialization processes need to change Strongly masculinized norm about the ideal technology entrepreneur	In general, positive towards women-only initiatives Strongly masculinized norm about the ideal technology entrepreneur	Positive towards women-only initiatives Strongly masculinized norm about the ideal technology entrepreneur

Discussion

The overarching research question we set out to explore in this paper is: *How do institutional contexts impact the implementation of policies that aim to address the gender divide in technology entrepreneurship?* Guided by Gains and Lowndes' (2014) analytical framework, we found that formal and informal gendered rules are understood and implemented in different ways within the four studied countries.

When studying 'rules in form', we found that there is no explicit discrimination against women at the macro institutional level. However, national policies regarding parental leave and childcare differ between countries and relate to either the individual gender model (Norway and Sweden) or the family breadwinner model (Ireland and Israel) (Sainsbury, 1999, 2011). We found that in terms of different gender regimes (also visible in scores by WEF, 2022), particular gendered contexts have a significant impact on policy implementation, both in terms of content and outcomes. These family provision policies have a strong impact on women's opportunities to engage in entrepreneurship (McAdam, 2013, 2022).

Not surprisingly, women and men operate within different sectors, and within different parts of the tech sector. Again, there are no formal obstacles preventing women from participating in any of the countries, yet informal norms and expectations guide women and men to choose different sectors. In addition, the implicit and explicit masculinized norms in tech entrepreneurship reflect the gendered norms in technology as a whole and are further strengthened by masculinized ideals in entrepreneurship in general (Marlow and Martinez Dy, 2018; Ahl, 2006, Bruni et al., 2004). Together, these norms reinforce each other and present a dual obstacle to women engaged in tech entrepreneurship. Policy makers in Ireland and Israel have specific programs to target female tech entrepreneurs in order to help them overcome these barriers, but instead of analysing taken-for-granted gendered norms, they try to 'fix the women' (Henry, *et al.*, 2017; Marlow and McAdam, 2013; Ahl and Marlow, 2012). Norway and Sweden have moved towards gender mainstreaming and integrated a gender equality perspective in all policy areas as a means to 'fix the system', but with the risk of making gendered challenges invisible.

At the meso institutional level, we found that the incubators in general implement policies in line with the stated policies of their respective countries. Consequently, in Norway and Sweden, where the national policies emphasize gender mainstreaming, the incubators do not rely on women-only programs. This does not mean that the incubators fail to recognize the gender gap as a problem. However, if and how they work to close the gender gap, differ between incubators. One of the Norwegian incubators focuses on activities to involve more women in general within the incubator community, i.e. among incubator employees, board members and investors. In Israel, on the other hand, societal norms pressure women to take full responsibility for childcare, but at the same time, national policies encourage women to engage in entrepreneurship through different programs. Thus, we find examples where

incubators offer breastfeeding facilities for women with infants as a way to promote national gender policies and support women entrepreneurs.

We find that incubator managers frequently cite "the pipeline issue" as an explanation for the low number of women tech entrepreneurs: They welcome women in TBIs, but since few women attend STEM education programs, there are also few women tech entrepreneurs, and the ratio of women remains low. However, this is a somewhat simplified explanation for a complex phenomenon. As argued by one of the Norwegian incubators, there are qualified women within STEM fields, but awareness raising efforts and other measures may be needed to fully engage them as entrepreneurs.

Our findings further show that actors at the micro institutional levels internalize gendered rules, norms and policies in ways that often – but not always – are in line with policies as stated at the macro level, and these trickle down to the meso level. One example is how the interviewed women in the different countries understand the 'problem' and the reasoning they use to explain where the problem of gender inequality arises. In the most gender equal countries – Norway and Sweden – the majority of women do not want to see women-only initiatives, arguing that this approach places the problem on the women. They do not want to be seen as 'second best' or as 'victims'. They argue that gender inequality is rooted in societal norms, which cannot be 'fixed' with programs for women. Instead, the solution is suggested to be in the way young children are socialized throughout the education system. In contrast to this perspective, we find that women tech entrepreneurs in Ireland and Israel hold positive views of the action plans and initiatives with a women-only approach. Although several of the respondents in these countries also argue that gender inequality stems from societal norms, they believe that women-only initiatives are beneficial and a step towards a more inclusive society.

As argued above, informal gender rules put different expectations on men and women at the macro level, which results in women and men operating in different parts of the technology sector. For example, there are higher proportions of women in health, medicine and education. This becomes visible at the micro level in terms of how women explain their entrepreneurial motivations. Women state that they develop tech 'to do good', to change society for the better. None of the female entrepreneurs report that their primary motivation is to make money or gain status. These findings relate to all four countries, implying that strong norms of who 'the typical technology entrepreneur' prevail. Even in the most gender equal countries, the foundational norm of the tech entrepreneur as a (white) young man with a technology background has not changed to any significant extent. Another similarity between the four countries is that the female entrepreneurs struggle with work/life balance and share the same experience of facing expectations and pressure regarding family obligations. This is somewhat paradoxical, as we might expect that women in the welfare states in Scandinavia have moved beyond this type of pressure.

In our rich data, we also find several examples of formal and informal rules that do not explicitly address gender, but still have gendered effects. At the meso level, this can be related to when and where different events are held at the incubator (cf. Acker, 2006) or how meetings with investors are framed. Several female entrepreneurs, who are also mothers, find it difficult to attend meetings during the evenings or feel uncomfortable if meeting with male investors at restaurants at night. On the micro level, we found that women use different strategies to deal with these types of challenges, thus operating in the grey zones that emerge in the startup process (Trauth, 2002; Levi, 2006).

Although the context differs, technology entrepreneurship remains a male bastion in all countries, which creates very similar outcomes in terms of the entrenched gender divide. The informal and highly gendered rules connected to the institution of technology entrepreneurship have gendered effects that seem to outweigh or counteract the positive effects that macro gendered rules could have on the meso and micro level, and this may explain the lack of difference observed between the countries in our study.

Contributions and implications

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The findings from our study contribute to entrepreneurship theory by applying gendered institutionalism theory to (tech) entrepreneurship, and clearly showing that the gendered context matters for policy implementation. Further, our findings contribute empirically to gender studies. The four countries have different gendered regimes that affect basic conditions, such as the availability of care facilities, which creates very different situations for women and men. The prevailing strong masculinized norms in entrepreneurship in general, and in the technology sector in particular, are visible in all countries studied, yet this strongly gendered context is not addressed in the gender policies, which are more general in their content. This is in line with previous studies showing that gender equality policies are often very general, and that the failure to recognize and applying the specific features of a particular policy into policy design and implementation may render policies less effective (Acker, 2006; Connell 2006). Addressing masculinized norms in tech entrepreneurship is recognized as important by actors on both the meso and micro levels, especially in the Scandinavian countries, and poses a possible future area for policy development.

In acknowledging contextual sensitivity in relation to policy development, we argue that women's entrepreneurship policy, whether separation or integration based, will be ineffective if it fails to challenge the existing masculinist nature of entrepreneurship. Although liberal feminist inspired integrative initiatives (or 'mainstreaming' policies) such as those seen in Norway and Sweden may initially appear to be more promising for women entrepreneurs, our findings indicate that women's ability to benefit from such is dependent on the extent to which women entrepreneurs conform to existing entrepreneurial norms. The pervasive argument of "no difference", means that women must adapt to the pre-established (eco)system, without questioning for whom, or by whom, the standards of this system are created. There is a lack of gender sensitivity in entrepreneurship policy and programs (Orser, *et al.*, 2012). Similarly, social feminist inspired women-only programs such as those seen in Ireland and Israel, give women access to support designed for their needs (e.g. mother-friendly facilities), with the likelihood of reinforcing gendered stereotypes of entrepreneurs and reproducing the second-ordering of women (Foss, *et al.,* 2019). We advocate for a shift away from solely focusing on women's access to resources towards fundamentally changing the structures that perpetuate gender disparities. To initiate this transformation, it is essential to unmask claims of neutrality in policy formulation and delivery at the macro level. This process encourages policymakers to explicitly recognize and address the implicit biases deeply ingrained in current policy frameworks.

At the meso level, it becomes crucial to challenge male norms that often camouflage themselves as neutral, thereby disadvantageous to women in entrepreneurial settings. Simultaneously, at the micro level, we must redirect attention from blaming individual women for the challenges they face within the system and instead focus on rectifying structural-level problems (Kvidal and Ljunggren, 2014; McAdam *et al*., 2019). By adopting this comprehensive approach, we can lay the foundation for meaningful change and create an inclusive entrepreneurial ecosystem that dismantles existing barriers and promotes gender equality.

Limitations and suggestions for future research
Informal gendered rules have a strong impact on formal gender rules, such as national gender equality policy in technology entrepreneurship. As a result, little difference is seen in the outcomes between countries with very different gender regimes and gender equality scores. These findings should be tested in other areas where such paradoxes have also been detected, such as gender differences in academic organisations and research. The present study has focused predominantly on interviews with women. We believe that additional studies focusing on men and masculinity could contribute valuable perspectives.

Acknowledgements

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