


Making spatial evolution work for all? A framework for inclusive path development

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The path development approach has advanced our understanding of the conditions and consequences of spatial evolution. However, in line with evolutionary economic geography at large, the path development literature has focussed primarily on economic growth and much less on the inclusion of disadvantaged groups. Drawing on evolutionary economic geography and inclusive innovation approaches, the article proposes a conceptual framework that combines industrial path development with inclusive path development driven by employment, entrepreneurship and education, and shaped by institutions, network access, agency and policies. The article empirically illustrates the framework by examining the inclusion of Arab and Haredi (Jewish ultra-orthodox) communities into Israel's high-tech sector.

Keywords: evolutionary economic geography, path development, inclusive innovation, agency, institutions, network access

JEL Classifications: R11, R58, B52, D63

Introduction

As a stream of evolutionary economic geography (EEG), the approach of regional industrial path development (Martin and Sunley, 2006; Tödtling and Trippl, 2013; Grillitsch et al., 2018) has advanced our understanding of the systemic conditions and consequences of spatial evolution understood as ‘the actual unfolding through time of the various features, structures and workings of real economic landscapes’ (Martin and Sunley, 2022, p.67, emphasis in the original). More recently, the path development literature has sharpened its focus on the role of agency and institutions (Hassink et al., 2019).

However, similar to EEG at large, the path development approach has not yet focussed on the inclusion of diverse social groups but remains focussed on achieving economic growth (Eadson and van Veelen, 2023). While economic geography has highlighted the implications of spatial inequality in left-behind places (Essletzbichler et al., 2018; Rodríguez-Pose, 2018; Evenhuis et al., 2021; MacKinnon et al., 2022), the inclusion of disadvantaged groups or minorities in paths has, so far, drawn less attention. Discourses on ethnic or minority entrepreneurship (for example, Aldrich and Waldinger, 1990; Bates et al., 2018) or inclu-

sive innovation (for example, Bramwell, 2021; Schrock and Lowe, 2021) address the inclusion of disadvantaged groups but lack a broader perspective of spatial evolution. Hence, there is a research gap in understanding how the inclusion of disadvantaged groups into paths unfolds and which factors drive or constrain it. Understanding these factors is critical in further refining policy approaches aimed at spatial evolution under the current tendencies towards experimentalism (Breznitz and Ornston, 2013; Coenen and Morgan, 2020), normativity (Uyarra et al., 2019), challenge orientation (Schot and Steinmueller, 2018; Tödtling et al., 2022) and responsibility (Fitjar et al., 2019).

This article aims at advancing EEG by complementing growth-focussed industrial path development with a perspective of inclusive development driven by employment, entrepreneurship and education derived from the inclusive innovation literature (Lee, 2023) and shaped by institutions, network access, agency and policies. An industrial path is defined here as a temporal trajectory of economic growth with idiosyncratic sectoral and spatial characteristics, and inclusive path development is understood as path-dependent and contingent processes that contribute to the economic inclusion of disadvantaged social groups into such a path.

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The article proceeds by introducing fundamental concepts before laying out theoretical considerations and proposing a conceptual framework for inclusive path development and applying the framework to the inclusion of Arab and Haredi (Jewish ultra-orthodox) citizens in Israel's high-tech sector.

Spatial evolution between growth and inclusiveness

At the core of EEG (Boschma and Frenken, 2006; Essletzbichler and Rigby, 2007) are concepts such as increasing returns (Arthur, 1989), lock-in (David, 1985; Grabher, 1993) and institutional hysteresis (Setterfield, 1993), which lead to path dependence (Martin and Sunley, 2006). However, rather than a 'canonical' model of path dependence (Martin, 2010) in the tradition of David (1985) and Arthur (1989), the path creation perspective (Garud and Karnøe, 2001) stresses the role of agency in forming and shaping paths (Garud et al., 2010),¹ thus combining path dependence with contingency (Mahoney, 2000; Bathelt and Glückler, 2003; Martin and Sunley, 2006, 2015; Glückler, 2007). Path dependence implies that each 'sequence of events creates unequal propensities for future events' but is counterbalanced by contingency because 'agents' strategies and actions may deviate from existing development paths' (Glückler, 2007, p.620). This perspective leads to an understanding of a path being a process instead of merely a passive result of past events (Martin, 2010) and contributes to widening EEG from its original primary focus on variation, selection and retention towards historical and developmental processes (Martin and Sunley, 2006, 2015, 2022).

The path-as-process perspective has been further conceptualized by the regional industrial path development approach in different forms of growth-focused paths (Tödtling and Trippl, 2013; Grillitsch et al., 2018; Hassink et al., 2019; Isaksen et al., 2019) and recently also declining, negative-growth paths (Blažek et al., 2020), the radical transformation of paths (Baumgartinger-Seiringer et al., 2021), the relationships between different paths (Frangenheim et al., 2020; Breul et al., 2021) and the greening of paths (Trippl et al., 2020). Coming from a perspective of sustainability transitions, a similar stream of the literature has focussed on the creation and growth of new paths based on environmental technologies (Binz et al., 2016; Fuenfschilling and Truffer, 2016). As an evolutionary concept, paths are long-term sequences of discontinuity and development with episodes of growth, decline and transformation (Martin, 2012; Benner, 2023a).

With its central interest in explaining 'the emergence and growth of new industries and economic activities in regions' (MacKinnon et al., 2019, p.114), the path development literature focuses on processes of innovation-driven economic growth in localized industries through vari-

ous mechanisms such as path creation, diversification, extension or upgrading (Grillitsch et al., 2018; Hassink et al., 2019). However, with few exceptions (for example, MacKinnon et al., 2009, 2019; Breul et al., 2021), questions about the inclusiveness of paths have remained largely absent from the EEG literature. For example, Eadson and van Veelen (2023) lament a lack of attention for wider questions of 'how potential and existing economic futures unfold for different (interconnected) places and what that means for well-being of those places (and the people who live in them)' (p.223), with that lack of attention rooted in 'a narrow view of path development' interested mainly in 'how investment is attracted or endogenous growth is fostered' (p.222). To a certain degree, this narrow view is astonishing as the inclusion of different social groups into economic development affects social and economic diversity (Jacobs, 1969; Florida, 2004; Zehavi and Breznitz, 2017) which is at the heart of evolutionary processes of variation, selection and retention (Boschma and Frenken, 2006; Essletzbichler and Rigby, 2007).² More broadly, inclusiveness deficits are an essential part of the 'dark side of economic geography' (Phelps et al., 2018) and have entered other debates in the discipline such as left-behind places (Essletzbichler et al., 2018; Rodriguez-Pose, 2018; Evenhuis et al., 2021; MacKinnon et al., 2022), global production networks (Werner, 2019) and the spatial impact of monopoly power (Feldman et al., 2021).

Beyond these topical debates, aspects of inclusiveness have been taken up by the discourses on inclusive innovation (Bramwell, 2021; Schrock and Lowe, 2021) and ethnic or minority entrepreneurship (Aldrich and Waldinger, 1990; Bates et al., 2018), although without an explicit focus on the inclusiveness of spatial evolution and its drivers. While a significant stream of the inclusive innovation literature focuses on poverty reduction in international development (for example, Chataway et al., 2014; Pansera and Martinez, 2017; Pansera and Owen, 2018), an emerging stream addresses the inclusiveness of technology-driven growth in high-income countries but still largely lacks systemic conceptualizations beyond case studies (Bramwell, 2021; Doussard and Clark, 2021). Recently, Lee (2023) reviewed the inclusive innovation literature, as well as local strategies, and distinguished innovative employment, entrepreneurship and education as mechanisms for the participation of disadvantaged groups. Schrock and Lowe (2021) place disruptive effects of the products of innovation, closed circles among the producers of innovation and resulting spatial inequalities at the heart of the inclusive innovation concept (see also OECD, 2017). The second and third problem speak to the critique that 'economic development efforts to stimulate innovation (...) pay little more than passing attention to who is in the room' (Schrock and Lowe, 2021, p.183) and are immediately relevant for the inclusiveness of spatial evolution. Bramwell (2021) observes that technology-driven growth

often disproportionately privileges young, white, highly skilled males that agglomerate in few urban regions (see also Heilbrunn, 2023). The challenge, then, is integrating under-served groups and peripheral regions into innovative processes of economic evolution (Bramwell, 2021; Schrock and Lowe, 2021). A range of policies aim at doing so (OECD, 2017; Zehavi and Breznitz, 2017) but their success will often be context-dependent, as Bramwell's (2021) cases in France and the USA show.

However, disadvantaged groups are not just passive bystanders in processes of economic evolution but exert their own agency by strategically adapting to opportunities (Aldrich and Waldinger, 1990; Daniel et al., 2019). The literature on ethnic and minority entrepreneurship provides a complementary perspective by looking explicitly at entrepreneurial dynamism in groups other than privileged dominant social strata. In their overview, Bates et al. (2018) identify limited access to skills, capital and markets as constraining forces minority entrepreneurs in the USA face but also stress that these constraints have lessened in recent decades, not least due to policies such as targeted public procurement. While ethnic and minority entrepreneurship can be confined to less dynamic parts of the economy (Sofer and Schnell, 2000), Daniel et al. (2019) demonstrate for the UK that some entrepreneurs manage to 'break out' into more dynamic sectors. A further prominent theme in the literature on ethnic and minority entrepreneurship is that social capital within ethnic communities can provide a resource for minority entrepreneurs but also isolate them (Portes and Sensenbrenner, 1993; Li, 2004; Bates et al., 2018).

While technology-based industries offer a way for economic inclusion, minority entrepreneurs might initially miss the social capital needed to succeed in those industries but can build it through higher education and academic involvement (Abu Nasra and Oliver, 2022). Jakob Sadeh and Nehab (2022) offer an overview of constraints to the inclusion of minorities into technology-based industries, discuss the interactions between pioneer firms, training, ecosystem building and government support, and argue for localized initiatives in regions inhabited by minorities. These insights allude to a place-based logic (Barca, 2019) of inclusion and stress the interactions between the inclusion mechanisms of employment, entrepreneurship and education.

Factors affecting inclusive path development

Given its roots in the fundamental perspective of paths as a process driven by agents' strategic actions (Garud and Karnøe, 2001; Garud et al., 2010; Martin, 2010) which acknowledges the role of 'mindful deviation' (Garud and Karnøe, 2001), the path development literature has come

to emphasize the role of *agency* as an intrinsic driver of spatial evolution (for example, Dawley, 2014; Jolly et al., 2020). Several conceptualizations of agency have been proposed. The distinction between firm-level agency and system-level agency departs from a firm-driven focus and draws attention to the role of various agents that shape the wider innovation system (Isaksen et al., 2019; Benner, 2023b). Following Hassink et al. (2019), 'firm-level agency has its main field of influence within one firm or organization, while system-level agency exerts influences outside its institutional and organizational borders' (p.1638). Grillitsch and Sotarauta (2020) propose a 'trinity of change agency' that includes innovative entrepreneurship, institutional entrepreneurship and place leadership, which are relevant for agents to seize impending opportunities. However, change agency does not capture agency that maintains paths (Henderson, 2020; Jolly et al., 2020) or reproduces them (Bækkelund, 2021) which will often be important for the consolidation of paths (Baumgartinger-Seiringer et al., 2021; Benner, 2023b).

Corporate diversity policies (Dobbin and Kalev, 2013) and homophilic role models (Bosma et al., 2012; Wyrwich et al., 2016; Tavassoli and Tripl, 2019) provide examples for firm-level agency in inclusive path development. As Bosma et al. (2012) argue, similarity such as belonging to the same minority enables individuals to compare themselves with successful role models by reasoning that 'I can do anything (s)he can' (p.414). In this way, witnessing role models' successful careers can contribute to reducing fears of entrepreneurial failure (Wyrwich et al., 2016). Policy agents often exert system-level agency (Dawley, 2014), as can higher education entities and non-governmental organizations (NGOs) (Bramwell, 2021). Both levels of agency will be important for inclusiveness. For instance, Shilon et al. (2022) and Harel et al. (2021) redraw the role of individuals and organizations that exert system-level agency aimed at changing the conditions for entrepreneurial activity among minorities and stress the importance of role models to demonstrate the feasibility of success.³ Yet, Jakob Sadeh and Nehab (2022) suggest that actions at the firm level may have limited impact due to constraints at the system level that are often related to network access and institutional patterns.

Apart from agency, paths are shaped by the structure and evolution of *networks* (Boschma and Frenken, 2006; Glückler, 2007). Within networks, agents draw on social capital (Coleman, 1988; Portes and Sensenbrenner, 1993; Li, 2004) which is based on trust between individuals and the reputation they enjoy (Glückler and Armbrüster, 2003). Within tight communities, individuals are connected by strong ties with high similarity that can generate, for example, mentorship relations (Bosma et al., 2012) while wider networks rely on weak ties that are often more relevant, for example, on the labour market (Granovetter, 1973).⁴ Inclusive path development will depend on how

members of minorities can draw on strong ties within their community where they may enjoy trust and reputation but also moderate the possible exclusionary effects of social capital (Portes and Sensenbrenner, 1993; Li, 2004) and on how they manage to participate in wider networks where trust and reputation have to be built from scratch (Abu Nasra and Oliver, 2022). For example, Shilon et al. (2022) highlight the role of network building as a prerequisite and a conduit for entrepreneurial knowledge spillovers from the majority population to minorities. Inclusion in networks, both within their ethnic group and beyond, is particularly important for entrepreneurs' quest for relevant information (Aldrich and Waldinger, 1990; Tavassoli and Trippi, 2019) but also for their access to support services (Bramwell, 2021).

Evolutionary processes take place within a multitude of institutions (Essletzbichler, 2009; MacKinnon et al., 2009; Evenhuis, 2017; Hassink et al., 2019) that circumscribe possibilities and constraints for inclusiveness (Bramwell, 2021; Doussard and Clark, 2021). While there is no universal definition of institutions (Rodríguez-Pose, 2020), some of the more prominent definitions refer to the function of institutions as formal or informal 'rules' as opposed to organizations as 'players' (North, 1990), to their regulative, normative and cultural-cognitive dimensions (Scott, 2014), or their nature as 'stable patterns of social practice based on mutual expectations' (Bathelt and Glückler, 2014, p.346). For the purposes of this article, institutions are understood as formal (explicit) or informal (tacit) 'templates for action' (Lawrence et al., 2009, p.7) based both on legitimacy and practice (Hodgson, 2006; Benner, 2022b). According to Huggins and Thompson (2019), institutions mediate between socio-spatial culture that includes values, beliefs and attitudes, and individual psychological personality traits on the one hand and agency on the other hand. When personality traits, for example those favouring entrepreneurial spirit, aggregate to the cultural level on a given spatial scale, they constitute (informal) institutions (Fritsch and Wyrwich, 2018). While institutions often show a considerable degree of hysteresis (Setterfield, 1993) and inertia with path-dependent characteristics (North, 1990; Martin and Sunley, 2006; Essletzbichler and Rigby, 2007; Bathelt and Glückler, 2014), institutional change can occur abruptly or gradually (Streeck and Thelen, 2005) and in two stylized directions. While upward causation flows bottom up from micro-level practices to institutional change, downward causation refers to top-down changes in macro-level conditions such as policies that induce institutional change (Hodgson, 2003; Bathelt and Glückler, 2014; Martin and Sunley, 2015). Both the maintenance of institutions and their change are affected by agentic processes of institutional entrepreneurship (DiMaggio, 1988; Battilana et al., 2009) and institutional work (Lawrence and Suddaby, 2006; Lawrence et al., 2009).

Institutions and their co-evolution with industries strongly affect spatial evolution (Boschma and Frenken, 2006; Gong and Hassink, 2019; Benner, 2022b). For example, psychologically and culturally rooted patterns of risk aversion, competitive or entrepreneurial attitudes, or mutual trust shape institutions (Wyrwich et al., 2016; Huggins and Thompson, 2019) and affect the probability of different forms of path development (Benner, 2020, 2022b). As cultural patterns are historically inert (Fritsch and Wyrwich, 2018), changing institutions can take generations (Estrin and Mickiewicz, 2011). Institutions can both constrain and enable action (Hodgson, 2003, 2006). Hence, on the one hand, they can pose obstacles to the inclusion of disadvantaged groups into paths, but on the other hand, institutional change can open up opportunities for inclusion.

Finally, evolutionary processes will be shaped by policies (Dawley, 2014). In particular, innovation policies play a role in inclusive path development and in recent years have seen a reorientation towards experimentalism (Breznitz and Ormston, 2013; Coenen and Morgan, 2020), challenge orientation (Tödtling et al., 2022), normativity (Uyarra et al., 2019) and responsibility (Fitjar et al., 2019). These tendencies characterize a 'third frame' of innovation policy that incorporates inclusiveness (Schot and Steinmueller, 2018). Consequently, innovation policies can include measures to strengthen social, industrial and territorial inclusiveness (OECD, 2017), but the degree of these tendencies in real policies is an empirical question. For example, Haddad and Benner (2021) examine patterns of inclusion and exclusion in the transfer of innovation policies such as cluster support, science and technology parks, or entrepreneurship promotion to Arab countries in the European neighbourhood and show how this policy transfer induces variegated effects on the inclusion of different parts of society. Even in policies with a high degree of challenge orientation, matters of inclusion are subject to negotiation, as the case of Morocco's renewable energy transition demonstrates (Haddad et al., 2022).

Conceptual framework

The conceptual framework (Figure 1) integrates the aspect of inclusiveness into evolutionary thinking by complementing the growth-focussed perspective of industrial path development (for example, Grillitsch et al., 2018; Hassink et al., 2019) with a perspective of inclusive path development driven by the three mechanisms of participation identified by Lee (2023), that is, employment, entrepreneurship and education.⁵ These mechanisms are broadly defined, with entrepreneurship including self-employment and education including training. While either of these mechanisms shapes industrial path development, if and how disadvantaged groups have access to them determines the inclusiveness of the path, that is, the degree of inclusive path development. How the inclusion

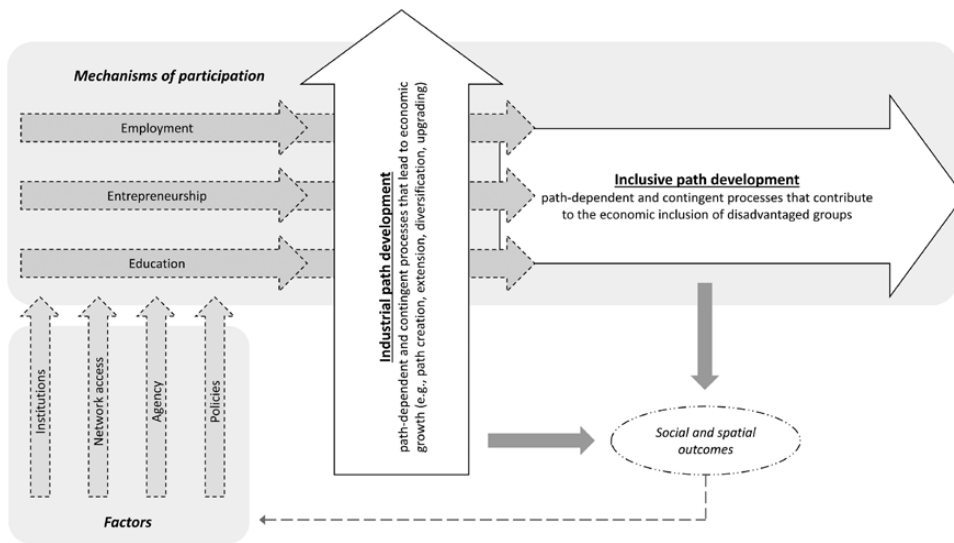


Figure 1. Conceptual framework (source: author's elaboration).

of disadvantaged groups evolves is in turn shaped by four factors affecting inclusive path development as follows:

- **Institutions:** institutions are marked by a considerable degree of hysteresis that makes them prone to reproducing themselves in a path-dependent way (North, 1990; Setterfield, 1993; Martin and Sunley, 2006). Institutions shape 'opportunity spaces' that delimit possibilities for agency (Grillitsch and Sotarauta, 2020) as well as the opening and closing of such opportunities on different scales (Benner, 2022a), and they perform both an enabling and constraining role (Hodgson, 2006). Despite hysteresis, institutional change through agency is possible (DiMaggio, 1988; Lawrence and Suddaby, 2006; Battilana et al., 2009). Institutional change can take place bottom-up through upward causation or top-down through downward causation (Hodgson, 2003; Bathelt and Glückler, 2014).
- **Network access:** within networks, trust and networked reputation (Glückler and Armbrüster, 2003) foster the emergence and maintenance of social capital (Coleman, 1988; Li, 2004). When it comes to processes of inclusive path development, trust and reputation shape the balance between strong ties within a disadvantaged group and weak ties in wider networks beyond the community (Granovetter, 1973; Monnickendam-Givon et al., 2018). Networks take path-dependent properties through inertia and lock-in (Glückler, 2007; Hassink, 2010) which can be particularly constraining in the case of strong ties (Grabher, 1993; Martin and Sunley, 2006). However, network access can be affected by institutions and institutional change, as well as by targeted policies for inclusiveness. Further, as a form of organization (Bathelt and Glückler, 2003), networks can be constructed and modified by agency (DiMaggio, 1988; Lawrence and Suddaby, 2006).
- **Agency:** in processes of path development, agency takes place on the firm and system level (Hassink et al., 2019; Isaksen et al., 2019). On either the firm level (for example, through corporate diversity policies or role models) and the system level (for example, in initiating and shaping policies), inclusive path development can be stimulated radically through change agency (Grillitsch and Sotarauta, 2020) or incrementally through reproductive agency (Bækkelund, 2021; Benner, 2023a), but it can also be constrained by maintenance agency (Henderson, 2020; Jolly et al., 2020). While change agency shapes the contingency of spatial evolution, reproductive and maintenance agency can also contribute to reinforcing path dependence (see also Mahoney, 2000).
- **Policies:** experimentalist (Breznitz and Ornston, 2013; Coenen and Morgan, 2020) and challenge-oriented tendencies (Schot and Steinmueller, 2018; Tödting et al., 2022) have shaped innovation policymaking during recent years. Under these broad trends, targeted policies to promote the inclusion of disadvantaged groups in paths (OECD, 2017) can affect each of the other factors but will be particularly relevant for institutional change through downward causation and for shaping disadvantaged groups' network access. Policies will in turn be shaped by agency through policy design and implementation and exert contingency on path development if they unfold a tangible impact, but they can also become institutionalized (Streeck and Thelen, 2005; Uyarra et al., 2017) and thus constrain or enable agency. Targeted policies include, *inter alia*, regional policies for regions inhabited by disadvantaged groups and

peripheral regions, entrepreneurship support aimed at disadvantaged groups, and skills policies (Zehavi and Breznitz, 2017; Bramwell, 2021; Harel et al., 2021; Abu Nasra and Oliver, 2022).

In the conceptual framework, spatial evolution consists of two aspects, growth-focussed industrial path development and inclusive path development, with each aspect varying in degree, depending on how the combination of the four factors shape the mechanisms of participation. More precisely, the impact of the factors on each of the mechanisms (employment, entrepreneurship, education) generates evolutionary patterns that combine the two aspects of industrial path development and inclusive path development. Both aspects of the resulting evolutionary trajectory are marked by 'the adaptive reconstruction of the developmental process' (Martin and Sunley, 2015, p.721) and, as such a developmental evolutionary process, exhibit characteristics of both path dependence and contingency (Martin and Sunley, 2006, 2015; Glückler, 2007; Garud et al., 2010; Martin, 2010, 2012). Depending on how combinations of factors affect the participation of disadvantaged groups in employment, entrepreneurship and education as well as the spatial location of these groups, the combination of industrial and inclusive path development generates specific social and spatial impacts that in turn (re)shape the factors. Absent radical transformations (Baumgartinger-Seiringer et al., 2021; Benner, 2023a), factors that underpin path dependence are expected to reinforce industrial path development in a non-inclusive way while factors that enable contingent change can contribute to more inclusive path development. The next section illustrates these processes in the case of the Israeli high-tech sector.

Inclusive path development in the Israeli high-tech sector: the Arab and Haredi cases

Due to its strong entrepreneurial dynamism (Senor and Singer, 2011) and its high ethnic and religious heterogen-

eity (OECD, 2016), Israel offers an extreme case (Flyvbjerg, 2006) for analysing inclusive path development. On the one hand, Israel's economy benefits from a highly dynamic high-technology sector that evolved since the 1970s while on the other hand it saw rising levels of inequality (Zehavi and Breznitz, 2017; Heilbrunn, 2023). The method chosen is a qualitative case study, which is suitable for exploring ongoing tendencies of inclusive path development, in line with EEG's methodological pluralism (Boschma and Frenken, 2006).

The case study draws on a qualitative document analysis of newspaper articles and a series of interviews. The document analysis covered 186 articles from Israeli general-interest or business and finance newspaper websites that were freely and fully available publicly (that is, without registration) and that dated from April 2012 to May 2022. This analysis served to prepare the analysis of the interviews, to interpret interviewees' statements correctly and in the context of history (Martin and Sunley, 2022), and to check the plausibility of the insights gained through the interviews. As the document analysis was meant as a preparatory step for the interview analysis, the empirical findings presented below are taken from the interviews.

A total of 40 semi-structured distance interviews were conducted online between December 2021 and June 2022 (Table 1), loosely aided by an interview guide that was adapted to include region-specific questions where appropriate. Sampling was informed by newspaper articles, other media reports and websites and partly by snowball sampling when deemed useful (Goodman, 1961). Participants⁶ included eleven Arab and eight Haredi⁷ interviewees, which allowed for capturing perspectives and experiences from inside these groups. Most interviewees agreed to recording and these interviews were transcribed.⁸ In four cases, an interview protocol based on notes was written immediately after the interview instead. In total, interviews generated roughly 24.5 h of recordings and more than 300 pages of transcripts or protocols.⁹

Coding was based on a deductive coding structure (Mayring and Fenzl, 2019) drawing on analytical guidelines

Table 1. Types of interviewees.

Interviewee type	Number of interviews
Entrepreneurs or startup managers	8
Experts	8
Policymakers	4
Representatives of higher education entities	2
Representatives of intermediaries (including NGOs, incubators or accelerators, or venture capital funds)	17
Representatives of multinational corporations	1
Total	40

Source: author's elaboration.

which emanated from the conceptual framework and defined its concepts further (see the methodological annex in the [Supplementary Material](#) for details). The coding process was assisted by MaxQDA software ([Kuckartz and Rädicker, 2019](#)).

Context

Particularly since the 1990s, Israel has seen a dynamic scene of high-tech entrepreneurship ([Kipnis, 2004](#); [CBS, 2017](#); [IIA, 2022](#)) that is commonly ascribed to experimental innovation policies aimed at the creation of a local venture capital industry and the establishment of incubators ([Avnimelech et al., 2007](#); [Breznitz and Ornston, 2013](#); [Wonglimpiyarat, 2016](#)), the effect of highly skilled immigration specifically from the former Soviet Union ([Schäfer and Henn, 2018](#)), and various socio-institutional and cultural patterns in Israeli society and Jewish tradition that have earned the country the popular nickname of the 'start-up nation' ([Senor and Singer, 2011](#); [Maggor and Frenkel, 2022](#)). Startups occur primarily in what is commonly understood as the country's 'high-tech' sector, which includes different technological sub-sectors such as enterprise software, digital health, financial technology, or cybersecurity and artificial intelligence ([IIA, 2022](#)). This high-tech sector is characterized by high dynamism, particularly in the Tel Aviv agglomeration as the country's economic hub, higher skills and income levels compared to the economy at large, and embeddedness into international knowledge flows ([Kipnis, 2004](#); [CBS, 2017](#); [Schäfer and Henn, 2018](#); [IIA, 2022](#)).

However, Israel's long-term economic development has not equally benefited various groups but is characterized by significant socio-economic and spatial disparities ([OECD, 2020](#); [Maggor and Frenkel, 2022](#); [Heilbrunn, 2023](#)). For example, the country's Arab minority has been largely isolated from the more dynamic sectors of the national economy for decades ([Sofer and Schnell, 2000](#); [Jakob Sadeh and Nehab, 2022](#)). While Arab¹⁰ and Haredi (Jewish ultra-orthodox) citizens make up roughly 20 and 10% of the population, respectively, poverty and low-paid employment remain widespread among these groups compared to the non-Haredi Jewish majority, while the segmented education system leads to skills deficits in secular subjects, in English among Haredi men focussing on religious studies and in Hebrew among the Arab population ([OECD, 2016, 2020](#); [Levi and Suchi, 2018](#); [Raz and Tzruya, 2018](#); [Schneider, 2018](#); [Frenkel and Wasserman, 2020](#)). The fact that, although military service is mandatory for most Israeli citizens, Arab citizens do not serve in the military and exceptions apply for Haredi men engaged in religious studies is important because of the Israeli army's role in the development of the high-tech sector and in building status, social capital and networked reputation ([Avrahami and Lerner, 2003](#); [Kipnis, 2004](#); [Honig et al., 2006](#); [Senor and Singer, 2011](#); [Levi and Suchi, 2018](#); [OECD, 2020](#); [Heilbrunn, 2023](#)).

These patterns of inequality mean that Israeli 'high-tech is preserving its homogeneity as a Jewish industry' and 'most of its employees are non-ultra-Orthodox men' ([IIA, 2022](#), p.17). At the same time, the high-tech sector suffers from a shortage of qualified staff, calling for inclusion of disadvantaged groups such as Arabs and Haredim, which are strongly underrepresented among high-tech sector employees ([Schneider, 2018](#); [IIA, 2022](#); [Jakob Sadeh and Nehab, 2022](#)).

Government policies aim at the inclusion of disadvantaged groups such as women, Arabs and Haredim into the economy at large ([OECD, 2016](#); [Schneider, 2018](#)). For example, for the Arab population, a 2015 government decision envisaged a diverse menu of support in fields such as housing, transport infrastructure and employment ([OECD, 2016](#); [Levi and Suchi, 2018](#)). Specifically for the high-tech sector, the Israel Innovation Authority (IIA) offers targeted financial support for under-served groups such as female, Arab or Haredi entrepreneurs ([Zehavi and Breznitz, 2017](#); [Schneider, 2018](#); [IIA, 2022](#)). A new large-scale government program that aims at socio-economic development of the Arab minority and that explicitly refers to inclusion in the high-tech sector was adopted in late 2021 ([IATF, 2021b](#)), a year that saw violent riots in mixed Jewish-Arab cities ([IATF, 2021a](#)).

The empirical case presented here focuses on two specific groups.¹¹ The Arab population lives to a large degree in the Galilee region, with Nazareth and a number of mixed towns such as Haifa as urban centres ([OECD, 2016](#); [IATF, 2021a](#); [Shilon et al., 2022](#)) and the 'triangle' area, a strip of several towns in the centre of Israel such as Tayibe, Tira or Umm al-Fahm ([Sofer and Schnell, 2000](#)).¹² An Arab entrepreneurial scene has developed in Haifa and Nazareth ([Shilon et al., 2022](#)). The Haredi community lives in cities and towns across the country but with Jerusalem and Bnei Brak, a city in the Tel Aviv agglomeration, as large urban centres ([OECD, 2020](#); [Heilbrunn, 2023](#)). Some of these regions host a range of multinational corporations (MNCs) such as Intel in Haifa and Jerusalem, and Amdocs, Broadcom and Microsoft in Nazareth (see also [Jakob Sadeh and Nehab, 2022](#); [Shilon et al., 2022](#)).

Findings¹³

For both disadvantaged groups, the following gradual processes of inclusive path development can be traced for the last roughly one and a half decades, apparently with an acceleration of activities in recent years.

Institutions: overcoming obstacles through upward causation

Institutions differ significantly between both communities and vis-à-vis the non-Haredi Jewish population. In the Arab population, relevant institutions include social preferences for stable employment and real estate investment instead of engaging or investing in entrepreneurship,

strong family ties that imply low spatial mobility and impede work in Tel Aviv,¹⁴ and a social preference for higher education particularly in medical fields, law and teaching. Underlying these institutions are psychologically and culturally rooted attitudes such as risk adversity, fears of students in technological fields facing unemployment and a resulting perception of technological studies as being ‘only for Jews’ (interview #15, entrepreneur). However, contrary to exhibiting a strong degree of institutional hysteresis, risk aversion is subject to a gradual change through upward causation which interviewees ascribed to the emergence of visible role models, generational change and exposure to entrepreneurial thinking at university and through the activities of NGOs (see below).

While not a dominant theme in the interviews, Jewish-Arab relations institutionally complicate employment of Arab citizens in Tel Aviv, for example when Arab citizens encounter instances of discrimination on the housing market or due to a general feeling of not belonging there, notably in periods of political tension, underpinned by a feeling of ‘coming from (...) sometimes colliding narratives’ (interview #24, intermediary) about Israeli society and history. Another constraining institutional pattern interviewees mentioned refers to Arab and Haredi jobseekers’ difficulties in mastering job interviews because of a high respect for authority that understates their confidence and competence. On the enabling side, however, work on Saturdays is easier for Arab employees than for Jewish ones.

In the Haredi community, there tends to be a certain degree of separation between men and women, within families women often assume the role of the breadwinners to allow men to focus on religious studies, and internet and smartphone use is often filtered (see also [Raz and Tzruya, 2018](#); [Frenkel and Wasserman, 2020](#)). In some parts of the community, there is a hesitancy towards academic study on secular campuses and a certain popularity of distance learning. However, there are signs of careful, selective and contingent institutional change through upward causation. As the rising cost of living and large family sizes exert pressure for more men to work, high-tech employment and entrepreneurship and the acquisition of related academic and professional skills have gained acceptance by some religious leaders, although this sometimes follows a ‘don’t look, don’t ask, don’t tell’ (interview #2, intermediary) approach. Some interviewees stressed that engaging in both religious studies and high-tech employment or entrepreneurship is no contradiction, notably because the latter can contribute to solving real-world problems. As one interviewee put it, ‘you don’t need to give away your way of life and your traditional beliefs and traditional values (...) and still, (...) you can establish a company, you can raise money, you can build (...) a cutting-edge technology’ (interview #40, intermediary). Successful role models play a part in this institutional change particularly

when it comes to entrepreneurship. Nevertheless, given fears of assimilation, higher education is still not universally welcomed in parts of the community. NGOs that offer training bridge this gap and, according to one interviewee, ‘it’s generally considered a good situation, and part of the rabbinical establishment is for that solution, specifically for women’ (interview #26, policymaker). In some cases, religious leaders might not permit young men to engage in academic studies prior to marriage but would do so when they are in their late twenties or early thirties. While women might encounter more reticence, employment in the high-tech sector meets acceptance by religious leaders on the rationale that it enables husbands to continue their religious studies, and separate workplaces for women institutionally facilitate their employment in a secular environment, although work-related social activities still require negotiating boundaries (see also [Raz and Tzruya, 2018](#); [Frenkel and Wasserman, 2020](#); [Maggor and Frenkel, 2022](#)). Further, several interviewees stressed that the culture and experience of deep Talmudic study among Haredi men facilitates fast learning, allowing them to catch up deficits on mathematics and English within a short time.

Network access: growing alternative networks

Interviewees highlighted the difficulty particularly of Arab employees and entrepreneurs in accessing the networks of the Tel Aviv startup scene with its ‘friends bring friends’ (interview #35, intermediary) mentality. Arab citizens lack the strong ties in networks non-Haredi Jews form during military service and notably in intelligence units such as 8200 which confer trust and networked reputation (see also [Honig et al., 2006](#); [Senor and Singer, 2011](#)). Hence, ‘when you’ve got an investor and you say, okay, I served in that unit and I have (...) the technological knowledge (...) that gives you (...) that stamp, that credibility’ (interview #24, intermediary). In the past, the lack of this kind of social capital seems to have caused Arab jobseekers rarely to be invited to job interviews because recruiters could not ‘read’ their CVs and assess their competences without references to networks such as 8200 or familiar universities.

While building networks during military service is generally not available to Arab citizens, education in universities has started to assume a similar function for them. One interviewee explicitly referred to the role of universities in building social capital among Arab students which holds true particularly in medical fields but increasingly also in information technology as more Arab students are studying engineering and mathematics. For example, another interviewee mentioned the network of Arab entrepreneurs and intermediaries that met during their studies at Haifa’s Technion and described how this network led to a forum of entrepreneurs that share networked reputation by exchanging recommendations about possible business partners or investors. This network-building function adds to the knowledge generation in universities

that one interviewee likened to that of the army's special units for Jewish entrepreneurs, stating that the '8200 of the Arab entrepreneurs are the PhDs and professors sitting in the universities who have a lot of [intellectual property]' (interview #6, intermediary). Another way Arab entrepreneurs build weak ties to wider networks is in forming Jewish-Arab co-founder teams.

For Haredim, one interviewee explicitly mentioned the differences between strong and weak ties and emphasized that despite strong ties within the Haredi community, weak ties to the wider society complicate finding suitable employment (see also [Monnickendam-Givon et al., 2018](#)).

Agency: spurring change and providing role models

The changes in institutions and network access described above are driven to a large degree by the system-level agency of NGOs. These include Tsofen and Hasoub (established in 2008 and 2014, respectively) offering training, events and accelerator programs for Arab students, employees and entrepreneurs, Presentense supporting entrepreneurs from various disadvantaged groups through training, networking and accelerators, and the alumni association of the army's 8200 intelligence unit which was involved in the Hybrid accelerator in Nazareth. In the Haredi community, NGOs exerting system-level agency include, among others, Kamatech (established in 2016) supporting entrepreneurship through networking and acceleration, Temech (established in 2005) promoting the professional development of Haredi women, Achim Global and Kemach. NGOs offer a wide range of events and accelerator programs, partly in collaboration with large MNCs, that strengthen strong ties among Arab or Haredi entrepreneurs and jobseekers and build weak ties in wider networks. Visits to companies or events with entrepreneurs or investors arguably help in building weak ties. However, an interviewee saw these wider networks for the Arab population as still limited to only parts of the high-tech sector, referring to 'Jewish-Arab bubbles' (interview #37, expert).

Universities are further important system-level agents that contribute to institutional change by facilitating education for disadvantaged groups. For example, Israel's Open University has become popular among Haredim seeking an academic education in technology through distance learning, and the Jerusalem College of Technology offers combined religious-technical studies and separate teaching for men and women as well as entrepreneurial programs such as contests and hackathons.

Relevant governmental system-level agents include specialized authorities for economic development of the Arab and Haredi communities within the Ministry of Social Equality that coordinate targeted policies for these groups, the IIA and municipalities, particularly in Haifa and Jerusalem. However, municipalities in mixed areas or those inhabited primarily by Arab citizens generally do not

exert major system-level agency which is arguably related to weak implementation capacities (see also [OECD, 2016](#); [IATF, 2021b](#)).

On the firm level, role models of successful entrepreneurs or managers have emerged. For example, an Israeli Arab who serves as a high-ranking Apple executive was repeatedly mentioned by interviewees as a well-known role model for high-tech employment. The visibility of entrepreneurial role models in the Arab minority, however, is still limited. In the Haredi community, visible role models include startups like Elementor but also those from the non-Haredi Jewish population, as one interviewee explained by referring to Jerusalem-based Mobileye. As a further instance of firm-level agency addressing entrepreneurship, venture capital funds have begun investing specifically in Arab or Haredi startups.

Firm-level agency affecting employment include a company called Galil Software that was established in 2008 and served as a pioneer in Arab high-tech employment in Nazareth. Further, MNCs notably in Haifa, Jerusalem and Nazareth began recruiting Arab or Haredi staff, probably to meet their human capital needs but facilitated by established diversity policies (see also [Frenkel and Wasserman, 2020](#); [Maggor and Frenkel, 2022](#)).

Policies: experimenting with place-based tools

Targeted policies¹⁵ for facilitating the participation of the Arab and Haredi groups in the high-tech sector¹⁶ include wage subsidies, specific training programs and a track of funding with favoured conditions for Arab, Haredi and women entrepreneurs ([OECD, 2016, 2017](#); [Zehavi and Breznitz, 2017](#); [Schneider, 2018](#); [Maggor and Frenkel, 2022](#); [Heilbrunn, 2023](#)). Compared to non-Haredi Jewish entrepreneurs, the higher funding rate helps particularly Arab entrepreneurs compensate for the scarcity of angel investors and investments by friends and family.

Other targeted government policies were combined with a logic of public-private partnership and 'place-based experimentalism' ([Coenen and Morgan, 2020](#), p.20). In 2002, a biotechnology and healthcare incubator was established in Nazareth under the government's technological incubators program ([Avnimelech et al., 2007](#)) that includes startups set up by Arab founders or by Jewish-Arab founder teams ([Zehavi and Breznitz, 2017](#)), in 2012 a business incubation centre, supported by the Ministry of Economy, was set up, and in 2015 the Hybrid accelerator was established with support by the same ministry ([Schneider, 2018](#); [Shilon et al., 2022](#)).

In a similar place-based logic, co-working spaces in Bnei Brak and Jerusalem such as Achim, Bizmax and Jerusalem Hub offer an institutionally adapted work environment, for example by limiting opportunities for casual mingling of men and women. These co-working spaces also offer an opportunity for employment in high-tech MNCs, facilitated by possibilities of remote work.

Social and spatial outcomes

Outcomes in terms of Arab and Haredi high-tech participation are evaluated differently among interviewees. Growing numbers of Arab students in technical fields and Arab employees in the high-tech sector appear promising. Among Haredim, notwithstanding the importance of high-tech employment particularly among women, an interviewee saw a small but dynamic entrepreneurial scene that testifies to 'a revolution, at least on the IT side, that we're starting to see in real numbers' (interview #2, intermediary).

However, the accessibility of sub-sectors varies. Differences are particularly obvious for the Arab community which faced bigger obstacles in information technology-related sub-sectors than in medical sub-sectors, and in some instances still do. In particular, cybersecurity largely remains 'a closed door' (interview #37, expert) for Arab citizens because of networks formed during military service and high requirements for security clearance. In contrast, in health-related sub-sectors, accessibility benefits from the preconditions of the medical industries:

"When (...) there were attempts to include Arab society within the medical professions, the entire industry was open. (...) You get in as a student, as a researcher in a pharmaceutical lab, and then you climb up, and then you eventually end up as a director of a laboratory within a hospital" (interview #37, expert).

This presence in the medical sector provides opportunities for Arab entrepreneurship because 'most of [Arab doctors] are working also (...) in the innovation centers of these hospitals, and they have a lot of [intellectual property], a lot of ideas' (interview #6, intermediary).

In terms of spatial outcomes, while an interviewee considered the Arab entrepreneurial scene in Nazareth as currently stagnant and the one in Haifa as flourishing (see also IIA, 2022), others saw slow growth in Nazareth. Further, the interviews revealed a tendency for expanding or intensifying NGO activities in the socio-economically more marginalized triangle area, for example through Hasoub's planned innovation centre in Ar'ara. Finally, the spread of remote or hybrid working during the Covid-19 pandemic has facilitated possibilities to work from home or from co-working spaces.

The generally promising qualitative developments reported here are mirrored by a significantly higher participation of Arabs in the high-tech sector, measured by indicators such as students in technical subjects, high-tech workers, startups or venture capital funds (Schneider, 2018; Shilon et al., 2022). For example, between 2008 and 2020 the number of Arab high-tech engineers increased from about 350 to 8,500 (Jakob Sadeh and Nehab, 2022). Still, at only 4.7 percent the combined share of Arabs and

Haredim in Israeli high-tech workers remains far below their share in the population (IIA, 2022).

Summary of findings

The processes observed can be attributed to the four factors of the analytical framework (institutional change, network access, agency, policies) on all three mechanisms for participation (employment, entrepreneurship, education), although to different degrees in both groups. Table 2 provides an overview of selected results for both the Arab (A) and Haredi (H) groups along the three mechanisms of participation and the four factors, highlighted by particularly evocative interview quotes where applicable.

Discussion

The results demonstrate that, while analytically distinct, the different mechanisms of entrepreneurship, employment and education (Lee, 2023) are closely inter-related and impacted in multiple ways by the four factors. Further, the results imply that the self-reproducing nature of institutions and limited network access is a major cause for the path dependence that poses severe barriers to inclusive path development, although gradual, contingent institutional change is visible, for example in a certain willingness among parts of the rabbinical leadership to allow Haredi men to work. The relationship between agency and institutional change is evident, for example, in institutionally accommodating educational programs such as distance learning. The importance of university education for network access of Arab students is intricately related to the upward causation of institutional change visible in attitudes towards high-tech employment and entrepreneurship that are, in turn, supported by the firm-level agency of recruitment by MNCs as well as visible role models that enhance the self-efficacy of members of the communities (Bosma et al., 2012). In the Haredi case, the enabling role of institutions is particularly evident in the actions of system-level agents such as NGOs and by conditions adapted to Haredi students offered by higher education entities, as is upward causation of institutional change due to increasing economic pressures. For the Arab population, the enabling role of institutions is visible in the social preference for medical studies that facilitates entrepreneurship in medical technologies and pharmaceuticals.

Targeted policies evolved in an experimentalist way and partly compensate for gaps such as the limited availability of business angels and family investments in the Arab community that are institutionally rooted. Large-scale government programs for socio-economic development in the Arab community exhibit considerable challenge orientation. Still, the results suggest that it is mainly NGOs and firms that exert change agency while governmental programs including public-private partnerships (Shilon

Table 2. Summary of results (selection).

	Employment	Entrepreneurship	Education
Institutions	<ul style="list-style-type: none"> • Acceptance towards work of women in the high-tech sector (H): ‘The rabbis know that if women are working in high tech, (...) they reach high salaries so the family can function better’ (interview #25, policymaker) • Institutions of religiously observant life (for example, defined gender roles, filtering of internet and smartphone use) as institutional parameters for the acceptance of employment (H): ‘There is no resistance if you are leaving the yeshiva and going into the workforce but you still keep your way of life’ (interview #40, intermediary)¹⁷ • Social preferences for stable employment (A): ‘So for a long time, this talent went to the Intels of the world and the place where you get a safe job (...), because why would my parents as an Arab put all this money in my education if I don’t bring a good salary in the end of the day’ (interview #9, intermediary) • Social preference against spatial mobility impeding employment in the Tel Aviv agglomeration (A): ‘[The] Arab population does [not] seem to be willing to commute much to work in high-tech companies, they prefer to work closer to home’ (interview #29, policymaker) 	<ul style="list-style-type: none"> • Social preference against spatial mobility favouring entrepreneurship in Nazareth (A): ‘Nazareth (...) has the advantage that the Arab entrepreneurs do not want to go to live in Tel Aviv, at least many of them do not want, so they live in their familiar surroundings’ (interview #5, expert) • Institutions of religiously observant life as institutional parameters for the acceptance of entrepreneurship (H): ‘The leaders of the community, (...) they see that someone can be a successful entrepreneur and at the same time (...) keep his own belief, his own identity’ (interview #35, intermediary) • Social preference for real estate investment over high-tech startups (A): ‘[High-tech startups are] something that we don’t understand, we don’t want to put our money there’ (interview #36, intermediary) 	<ul style="list-style-type: none"> • Hesitancy towards but increasing tolerance of studies in a secular environment, particularly for men (H): ‘If you go to your rabbi (...) and ask, “can I go to the university?”, they’ll say, “it’s not good for you, you are not here in this world to do that”. But it’s changing, they understand, like if you don’t have food in your house, (...) they’ll tell, “okay, just go and find a job”’ (interview #8, entrepreneur) • High social prestige of university studies and social preference for medical professions, law and teaching (A): ‘The Arab mom, also in traditional neighborhood[s] and villages and in places you wouldn’t expect (...) their role model is to send someone to school and to be a doctor or to be an engineer’ (interview #26, policymaker)
Network access	<ul style="list-style-type: none"> • Strong ties within the community but somewhat weaker ties beyond (H): ‘Most of the ultra-orthodox men and women have a strong connection inside the community (...) [which] will help them if they (...) need help in any stage of life (...) . But this kind of network or social capital (...) [is] not helping them [in] finding the appropriate job’ (interview #30, expert) 	<ul style="list-style-type: none"> • Lack of strong ties formed in military service and by location in the Tel Aviv agglomeration, but compensation through educational networks (A): ‘Sometimes we share ideas about (...) where can you find a good graphic designer or a good marketing strategy guy, or “I spoke to this investor, has anybody heard of him?” (...) lots of us, we know each other because it’s all started from the Technion group’ (interview #15, entrepreneur) 	<ul style="list-style-type: none"> • Network access through higher education (A): ‘If you need a PhD degree it means that you went through undergraduate, graduate, and PhD and a postdoc maybe. In life sciences, it’s all in labs, so you get to know everyone around you, it’s all collaborative research, it’s all co-authorships, you travel to conferences, to academia, you manage to form ties with scholars or scientists from different places, sometimes you collaborate with the industry when you’re in academia, you get access to more opportunities’ (interview #28, expert)

Table 2. Continued

	Employment	Entrepreneurship	Education
Agency	<ul style="list-style-type: none"> Diversity policies of MNCs (A, H): <i>“Bigger corporations and especially multinationals (. . .) seem to have a diversity policy. (. . .) they have more attention capacity towards [including disadvantaged groups] as opposed to like a young startup’ (interview #29, policymaker)</i> Support of NGOs in building networks (A): <i>‘[There are] a lot of people coming to [the NGO] and then gradually widening their networks and then getting involved in different cycles or getting jobs’ (interview #24, intermediary)</i> Role models of successful Arab high-tech managers (A): <i>“There [are] some (. . .) role models (. . .) at the human resource side (. . .) working in the big companies, but not at the entrepreneurship side because we don’t have these big success stories till now’ (interview #6, intermediary)</i> 	<ul style="list-style-type: none"> Entrepreneurial role models, also from the non-Haredi Jewish majority (H): <i>‘Like there’s (. . .) Mobileye, which is the largest exit in Israeli history. (. . .) this massive building next to a massive ultra-orthodox neighborhood, (. . .) you’re a 15 year-old Haredi kid, you wake up in the morning, you look out the window, and there’s this gleaming skyscraper of a \$15 billion company that you can like reach out and touch, so it becomes part of the fabric of what you’re thinking about, and you say, “well, I’m smart, I have a good idea, let me try that”’ (interview #2, intermediary)</i> 	<ul style="list-style-type: none"> Universities and colleges offering distance learning and institutionally adapted study programs combining secular and religious studies (H) Mentoring programs, trainings, or workshops organized by NGOs, partly in collaboration with startups or MNGCs (A, H)
Policies	<ul style="list-style-type: none"> Place-based policies including co-working spaces with institutional adjustments (H): <i>Brak and in the environment of a Haredi place with the culture and everything and close to home’ (interview #39, intermediary)</i> 	<ul style="list-style-type: none"> Targeted funding schemes for entrepreneurship (A, H) Place-based policies including co-working spaces, incubators, and accelerators (A, H) and with institutional adjustments (H): <i>‘You’re not going to see (. . .) yoga or pilates or things like that. (. . .) We focus just on business. (. . .) You’re not going to see beer (. . .) at happy hour or things like that. And [there is] some kind of separation between men and women (. . .) the business side [is] not separate but the social side [is] separate’ (interview #40, intermediary)¹⁸</i> 	<ul style="list-style-type: none"> Targeted subsidies for training (A, H): <i>‘Those companies receive a higher funding if they train one of those three underrepresented groups like women, Arabs and ultra-orthodox’ (interview #29, policymaker)</i>

Source: author’s elaboration.

et al., 2022) largely exert reproductive agency, albeit local entrepreneurship policies (for example, in Haifa) and early incubator programs in Nazareth exhibit a higher degree of change agency. Hence, in a simplified summary, inclusive path development in both communities can be understood as an evolution driven primarily by the change agency of firms and NGOs, which supported ongoing but gradual upward causation of institutional change, reinforced by mostly reproductive governmental policies.

The interrelationships between the factors highlight the delicate interplay between path dependence and contingency. This interplay is particularly visible, for example, in the emergence of angel investors in the Arab community. While the Arab angel scene is still very small, the emergence of Arab high-tech entrepreneurs who invest in other entrepreneurs might become self-reinforcing and break with investment preferences rooted in risk-adverse attitudes.

Crucially, weak ties to the wider society, important as they may be, are not sufficient for inclusive path development. As one interviewee highlighted, Arabs have been involved in networks in the mixed city of Haifa for a long time, but what eventually advanced Arab high-tech inclusion was the development of a high-tech industry in Nazareth. Hence, an important insight from this case is the place-based nature of inclusive path development understood as an aspect of *spatial* evolution. The place-based policies and initiatives implemented in Nazareth address this issue in a way consistent with the institutionally rooted low spatial mobility among the Arab population (see also Jakob Sadeh and Nehab, 2022).

An important conclusion is that processes and outcomes of inclusive path development will vary between sub-sectors, as the varying accessibility of the cybersecurity and health technologies sub-sectors for Arab citizens demonstrates (see also Abu Nasra and Oliver, 2022). These persistent differences in accessibility exhibit a considerable degree of path dependence. Further, different approaches are needed for different communities. For instance, Haredi preferences for keeping a religiously observant lifestyle require more specific approaches to education and training such as distance learning compared to the enrolment of Arab students in the same universities that non-Haredi Jewish students attend. Further, contrary to Florida's (2004) 'creative class' argument, the case shows that inclusion can work on a strictly economic level without cultural integration and that specifically designed institutionally enabling spaces might eventually offer better conditions for inclusion than the 'melting pot' (p.261) of large urban economies such as Tel Aviv.

In terms of outcomes, while the seemingly slow advances in the inclusion of both groups in the Israeli high-tech sector emphasizes the power of path dependence, it is important to remember that path development is a long-term, historical process that can span decades

(Martin and Sunley, 2022; Benner, 2023a). Thus, while the balance between path dependence primarily on the levels of institutions and network access on the one hand and contingency driven particularly by agency and policies on the other hand has resulted in an ongoing process of inclusive path development for roughly a decade and a half, the eventual outcomes of this process cannot yet be evaluated (see also Maggog and Frenkel, 2022).

Conclusions, limitations and policy implications

Based on the critique that EEG has tended to focus on the growth of new industries, for example, in 'new growth paths' (Hassink et al., 2019, p. 1638, emphasis added), while largely neglecting wider aspects of social and spatial inclusiveness (Eadson and van Veelen, 2023), this article has sought to complement this conventional, growth-focussed approach with a perspective of inclusive path development. By doing so, the article adds an evolutionary view to the emerging literature of inclusive innovation on the local and regional level in high-income economies (Bramwell, 2021; Doussard and Clark, 2021; Lee, 2023).

What such an evolutionary view offers to the discourse on inclusiveness is particularly its attention on the interplay of path dependence and contingency in a path-as-process perspective (Martin, 2010), as well as insights into which factors drive this interplay and how. The results of the case suggest that two factors, institutions and network access, tend to function as a source of path dependence when viewed statically but can be affected by the agency of firm and system-level agents, as well as by the policies agents pursue. According to the considerations behind the conceptual framework, these two factors are seen as the major drivers for inclusive path development while the other two (institutions, network access) are more prone to perpetuating conventional industrial path development. Through interventions by agency and policies, strict path dependence and lock-in into exclusive, growth-focussed industrial paths can be broken through contingent change (see also Mahoney, 2000), opening up possibilities for inclusive path development. The conceptual framework can thus serve as a starting point for evolutionary research on the causes and consequences of the inclusion and exclusion of disadvantaged groups in high-income economies.

As a single case study, the empirical context in Israel is situated in its peculiar conditions, which limits the possibilities for generalizing findings for other contexts. Still, the case demonstrates how various groups differ in the peculiar challenges they face in achieving inclusive path development, and by extension, how policymakers need to pursue variegated approaches. The analytical framework proposed here allows for examining the specific characteristics and challenges of disadvantaged groups and to

design tailor-made policy responses to promote their inclusion. While drawing on the distinction of three mechanisms for participation of disadvantaged groups in an industrial path, the empirical case shows how closely interwoven employment, entrepreneurship and education are. Hence, policies for inclusive path development will often have to take a comprehensive outlook that goes beyond policy silos. While preliminary ideas for such policies exist (for example, [Zehavi and Breznitz, 2017](#)), much more research on the policy side will be needed.

Finally, on the theoretical and empirical sides, this article raises several questions for further research. For instance, even though institutions and network access seem to reinforce exclusive industrial paths in a path-dependent way, are (change) agency and policies necessarily needed to unleash contingent change towards inclusive path development or are there industrial paths that constitute themselves in a more inclusive way from the outset? Taking a multiscale view, how do trade and investment agreements or EU alignment ([Reich, 2015](#); [Gong and Hassink, 2019](#); [Benner, 2022a, 2022b](#)) affect inclusive path development? Apart from the inclusion of disadvantaged groups into an existing path, how inclusive are completely new paths? For regions confronted with transformations towards green paths ([Trippel et al., 2020](#)), how can inclusive and green path development be achieved ([Eadson and van Veelen, 2023](#))? The latter question is particularly topical as the abandonment of environmentally unsustainable paths might disadvantage some parts of the population more than others and can generate new inequalities ([MacKinnon et al., 2019](#)). In any case, EEG will need to pay attention to unequal outcomes of evolutionary processes to examine under which circumstances spatial evolution can indeed work for all.

Endnotes

- 1 For a useful overview of different conceptualizations of path dependence, see [Evenhuis \(2017\)](#).
- 2 I am grateful to Max-Peter Menzel for drawing my attention to this point.
- 3 Nevertheless, the glorification of entrepreneurial role models can obscure the downside risks of entrepreneurship ([Heilbrunn, 2023](#)).
- 4 I am grateful to an interviewee for drawing my attention to this point.
- 5 To be precise, [Lee \(2023, p.7\)](#) enumerates 'participation in entrepreneurship', 'participation in the innovation workforce', and 'participation in education' as levers for inclusive innovation policies. The framework proposed here draws on the underlying socio-economic mechanisms that are distinct from policies which are seen as a factor that can affect either of the mechanisms.
- 6 Two interviews included two interviewees, respectively.
- 7 Given the heterogeneity of the Haredi population and the fluid borders to other parts of the religious Jewish population, the distinction between Haredi and non-Haredi Jewish participants is not fully clear-cut.
- 8 Direct interview quotes reproduced here were slightly edited for language reasons where necessary. If interviewees explicitly wished to see these quotes, they were shared and slight editing suggested by interviewees to improve precision was accepted.
- 9 In one case, an additional question was subsequently asked per e-mail and the reply was included in the analysis.
- 10 In what follows, the focus is on Arab Israeli citizens and therefore includes neither East Jerusalem residents who do not hold citizenship ([IATF, 2021a](#)) nor Palestinians in the West Bank.
- 11 The results should be seen as generic tendencies as both minorities exhibit a considerable degree of internal heterogeneity ([Levi and Suchi, 2018](#); [Raz and Tzruya, 2018](#)).
- 12 The focus of the case study does not include the Druze minority and the Arab Bedouin minority, although some of the insights are similar for the latter ([Harel et al., 2021](#); [Jakob Sadeh and Nehab, 2022](#)).
- 13 Most empirical insights presented in this sub-section confirm those reported by [Zehavi and Breznitz \(2017\)](#); [Schneider \(2018\)](#); [Abu Nasra and Oliver \(2022\)](#); [Shilon et al. \(2022\)](#); [Jakob Sadeh and Nehab \(2022\)](#) and [Heilbrunn \(2023\)](#).
- 14 Deficits in public transport add to these institutional constraints ([OECD, 2020](#); [Heilbrunn, 2023](#)).
- 15 Policies are understood here in a broad sense, referring not only to government policies but also those of municipalities or philanthropic organizations, and thus including deliberate strategies pursued by system-level agents.
- 16 For a more comprehensive overview of policies for the Arab and Haredi groups, see [IATF \(2021b\)](#); [Levi and Suchi \(2018\)](#); [OECD \(2016, 2017\)](#) and [Schneider \(2018\)](#).
- 17 A *yeshiva* is a school for religious studies.
- 18 The argument made in the quote about co-working spaces is valid both for employment and entrepreneurship.

Supplementary material

Supplementary material is available at *Cambridge Journal of Regions, Economy and Society* online.

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Data availability

The coding structure used for the document analysis and for the analysis of interview transcripts or protocols is presented online in the methodological annex.

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