

RESEARCH PAPER

High-Tech Entrepreneurship in the Israeli-Arab Community



The Eli Hurvitz Institute of Strategic Management,
Tel Aviv University- Faculty of Management

Dr. Vered Holzmann, Dr. Ramzi Halabi

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Abstract

The current research investigates high-tech entrepreneurship in the Israeli-Arab Community. It was initiated based on the assumption, supported by statistical data, that the socio-economic status of the Arab community in Israel is inferior to the general Israeli community. It was aimed to exploit the capacity of Israel as a "start-up nation" in order to find the most important aspects that will promote integration of Israeli-Arab entrepreneurs and young engineers in high tech startups and business companies.

Following a literature review, we conducted an integrated study that included a survey, semi-structured interviews, and a case study analysis to explore the intentions, motivations and barriers to Israeli-Arab entrepreneurship from multiple perspectives. The implementation of the study was supported by Tsofen, a leading non-profit organization whose mission is to foster the integration of Israeli Arab citizens into the high-tech industry, as a means to access as many relevant stakeholders as possible. The comprehensive examination enabled us to identify the drivers and difficulties for Arab entrepreneurs in Israel on the personal level, on the community level, and on the infrastructure-institutional level. Three major elements were found to be the most influential on Arab high-tech entrepreneurship in Israel: education, financial resources, and strategic-institutional support.

We believe that each one of those elements can and should be addressed by policy makers in order to foster Arab high-tech entrepreneurship which will have a long-term impact on the Arab community in Israel and on the Israeli society in large.

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Introduction

The Israeli innovative and creative society achieved in the last few decades phenomenal success rates in the global high-tech industry (Senor and Singer, 2009), but unfortunately most of those accomplishments are not shared by the Arab community in Israel. Based on the Israeli Central Bureau of Statistics, the Arab community in Israel constitutes 20.73% of the population (74.96% are Jewish and 4.31% others; data of 2015), but it contributes only 8% to the GNP (Gross National Product). Statistical data on higher education shows that this community constitutes 13.5% of the students' population for first degree, 10.1% of second degree, and 5.4% of third degree (Israeli Central Bureau of Statistics, 2013-4). Although the figures are changing during the years, they still represent a significant difference between Jewish and Arab citizens in education, and more significantly, in the labor market.

With the aim to make a change in the Israeli Arab community, several organizations, most of them NGOs (non-governmental organizations), follow the vision to integrate Arab people in the high-tech entrepreneurial arena in Israel. This vision is based on the understanding that (a) Israel is a leader in the global high-tech entrepreneurship field; (b) any talented individual can succeed in this arena; and (c) successful entrepreneurs and successful enterprises create value to society. The vision is translated into practical implementation by a variety of initiatives, including training programs for Arab engineers and academics, placement of employees in leading global high-tech companies, and establishment of entrepreneurship labs and innovation centers in Israeli Arab cities.

The current research aims to investigate the impact of integrating Israeli-Arab high-tech entrepreneurs in businesses from multiple perspectives: personal, familial, communal, municipal, and national. The study was conducted in cooperation with Tsofen, which is a non-profit organization whose mission is to foster the integration of Israeli Arab citizens into the high-tech industry as a means of promoting economic development, reducing poverty, creating high value jobs in Arab urban centers and integrating Arab citizens into the Israeli civil society. The involvement of Tsofen in the Arab community was exploited for the purpose of this study, to access Arab entrepreneurs, Arab academics and engineers who are looking for jobs in the high-tech industry and those who are employed in local and global high-tech companies, their families and employers, and Arab political and social leaders. This collaboration gave us an opportunity

to collect and analyze data on several levels and to produce recommendations for future activities.

The study was conducted In Israel during the year of 2016, with the support of The Eli Hurvitz Institute of Strategic Management, Faculty of Management at Tel Aviv University.

This report includes a literature review on high-tech and entrepreneurship in Israel, the Arab minority in Israel, characteristics of minority entrepreneurship, and the impact of entrepreneurship on the community and society. Based on the theoretical background, we conducted a three-method research that included a survey of 73 Israeli-Arabs who are involved in the high-tech industry, including university and college graduates, entrepreneurs, mentors, and employees; 16 semi-structured interviews with successful Israeli-Arab entrepreneurs and other stakeholders involved in the partnership between Israeli-Arabs and high-tech businesses; and a case study analysis of Nazareth to demonstrate a successful development and implementation of high-tech industry in the Arab community. The quantitative and qualitative data was analyzed to learn about personal and social motivating factors to entrepreneurship, educational and socio-economical barriers for entrepreneurship, and required infrastructure to support successful entrepreneurship.

Literature Review

The literature review starts with a brief introduction of the role of high-tech and entrepreneurship in the Israeli economy, and continues with a report on the Arab minority in Israel with the aim to provide a profile of the community and its economic environment. Then, we focus on characteristics of minority entrepreneurship to understand entrepreneurs' intentions, their incentives to choose the entrepreneurial route on one hand and the obstacles that they face on the other hand.

High-tech and Entrepreneurship in Israel

Levenstein (2004) claims that “entrepreneurship plays a crucial role in economic growth, both in society at large and within specific communities” although the reference to entrepreneurs was as anyone who runs his or her own business, not necessarily in the high-tech industry. Similar view is presented by Lee and Peterson (2001) who create a connection between culture and environment to entrepreneurial orientation and entrepreneurship, and from there to global competitiveness.

The high-tech industry is considered attractive thanks to its association with innovation, high value-added production and success in foreign markets, and its positive impact on other commercial sectors that increase productivity, business expansions, and high-wage jobs (Harpaz & Meshoulam, 2004). Within this industry, the role of entrepreneurship is important since it is a vehicle for social mobility and community development (Quadrini, 2000; Edelman et al., 2010), it is based on knowledge which is a main source of competitiveness (Audretsch & Thurik, 2003) and it is associated with an increase in economic growth, competitiveness and job creation (Thurik & Wennekers, 2004; Wong et al., 2005; Hafer, 2013).

The Israeli high-tech industry is continuously growing since the early 1990's and it achieves great success rates in the global high-tech industry and startups during the years (Cohen, 2005; Chorev & Anderson, 2006; Senor and Singer, 2009; Kon et al., 2014). In general, the high-tech industry in Israel takes a significant role in the Israeli wealth, with an increase of 135% positions, from 115.5 thousand in 1995 to 271.3 thousand in 2011. For comparison, within this timeframe (1995-2011) the total increase of salaried workers in the Israeli working force was only 58%. In 2011, the rate of employed men in high-tech was 66%, comparing to 52% in the overall labor

market. Those workers are usually young (ages 25-34) and they earn almost double than the average wage in the labor market (2013 ,ס"מ). Based on the annual report of the Israel Innovation Authority (2016), the high volume and value of high-tech performance in the last five years is increasing. In 2015 there were 693 transactions in which \$4.4 billion were raised, reflecting the high rate of foreign investment, which also reached a record of 85% of total investment in the high-tech industry.

Considering R&D (Research and Development), which is the front-end of knowledge technological advancements that creates competitive advantages in the global market, Israel R&D share in the GDP (Gross Domestic Product) is amongst the highest among the developed countries, with 3.4% in 2011(2013 ,ס"מ) and 4.3% in 2014 and 2015 (Israeli Central Bureau of Statistics, 2016). As of 2017, across the OECD countries, Israel is the country with the highest R&D intensity (4.25%), i.e., the highest expenditure on R&D as a percentage of GDP (OECD, 2017).

The Global Entrepreneurship Monitor Report (GEM, 2016) identifies Israel as an entrepreneurial country, where 86% of people think entrepreneurs have high status. Israel is classified as an innovation-driven economy, where technology and service activities are most common. Focusing on Israeli-Arab high-tech entrepreneurship, previous studies characterized the Arab industrial entrepreneurship in Israel as a unique phenomenon, related to regional development (Shnell at al., 1995), though there were only marginal signs of shifting towards high-tech or advanced industrial branches in the last decade of the twentieth century (Schnell & Sofer, 2003). In this study, we will explore the development of this trend in the following years at the beginning of the twenty-first century.

The Arab Minority in Israel

The Arab community in Israel constitutes about 20% of the overall population in Israel. The community includes Muslim, Christian Arabs, and Druze. This community is characterized by large families with an average of 4-5 family members that live in small towns and villages, mainly in 79 local Arab municipalities, out of 255 local municipalities in Israel. The socio-economic status in the majority of the Arab municipalities (in 64 out of 79, which represent 81%) is in the lowest three (out of ten) levels.

Education in general, and higher education in particular, have increased in the last decade, although it is still at a lower level comparing to the Jewish population. The Arabs in Israel are employed in similar rates to Jewish, but it is based on younger employees and employability of women is significantly lower for Arabs comparing to Jewish. In addition, the poverty rate among the Arab community is about twice than Jewish families, and the contribution of Arabs to the GDP is only about 8% (2015, רמסיס; 2008, חביב). Although the Arab community represents more than fifth of the Israeli population, Arabs in Israel are under-represented in higher education and in the high-tech industry.

Education of Israeli-Arabs

The Education at a Glance report, by the Organization for Economic Cooperation and Development's (OECD, 2012), ranked Israel on the second place thanks to the country's high school graduation rate, which was 92% in 2010, well above the OECD's 84% average, and to 46% of residents that had a tertiary education, versus 31% for the OECD. Within the Israeli society, during the first decade of 2000's, the education level of Israeli-Arabs increased among men, and even more among women. The rate of Arab men with 13 or more years of study increased from 21% in 2001 to 26% in 2012, while this rate for Arab women increased from 15% in 2001 to 29% in 2012. However, those numbers are still significantly lower than Jewish Israelis (57% of men and 62% of women). The same trend exists in higher education, where the number of Arab students increased from 9,369 in 2004 to 14,008 in 2012. Thus, about 10% of Arab men and women were academics, out of 46% of the total Israeli population (2015, רמסיס).

A field study on Arab students' success, from application to graduation in the four leading universities in Israel (2015, אלוך) revealed that Arabs' rate of graduation is lower than other students in almost all areas of studies (except medicine). In addition, the rate of Arab students that graduate in the department they started their studies is significantly low comparing to Jewish students. There is a mismatch between academic capabilities and the selection of field of studies, which is most evident in the technological and sciences fields (engineering and computer sciences), where Arabs graduation rate is only 30%.

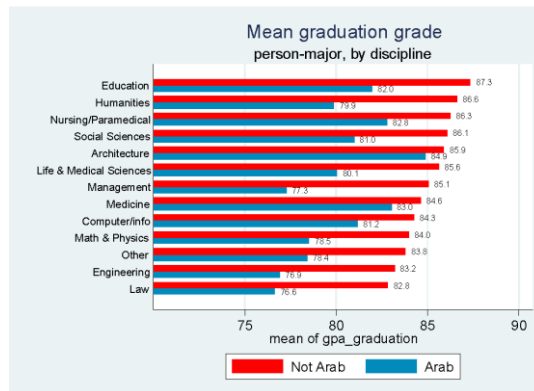


Figure 1: Mean Graduate grade, by discipline (from 2015, אלוני)

According to this study, the average graduation grade of Arab students is lower than the average graduation grade of Jewish students. The reasons for this gap are that the Arab students are usually younger than their Jewish colleagues are, the socio-economic status is lower, they are less prepared to academic studies, and there is a mismatch between academic capabilities and the selection of field of studies.

Many studies refer to the close relationship between education and employability (e.g., Harvey, 1999; Lees, 2002; Knight & Yorke, 2003; Finch et al., 2013), and data shows that in all OECD countries, academics are more likely to be employed, represented by 84% of academics (OECD, 2012). Thus, it can be concluded that higher education improves the chances of employability and the likelihood to remain employed in times of economic crisis and high unemployment.

Focusing on the relationship between education and employability in the context of the Israeli-Arab academics, a report by the research and economic unit at the Ministry of Economy and Industry on the employability of Arab academic is Israel (2011, ליס) reveals that Arab academics are younger than Jewish Academics (average age 38.9 for Arab academics and 42.9 for Jewish academics), and most of them live in the north of Israel (58.9%) while the majority of Jewish academics (56.5%) live in the center of Israel. Employed Arab and Jewish academics is almost the same (82.8% and 82.1%, respectively). However, 44.4% of Arab undergraduates in high-tech related fields (such as, exact sciences, life sciences and engineering) work as teachers or teaching-related occupations. Other 27.5% work in sales, services, clerk or management related occupations, and only 20% work in jobs related to their field of studies. In order to change those figures, it seems that more attention should be paid to education and training of Israeli-Arabs,

since previous studies show (e.g., Crayford et al., 2012; Solesvik et al., 2013) that entrepreneurial education is linked to personal development and employability skills and contributes to entrepreneurial mind- set.

Employability of Israeli-Arabs

The second part of the report by the research and economic unit at the Ministry of Economy and Industry on the employability of Arab academic is Israel (2011 ,ל"ס) deals with obstacles in the development of Arabs' owned businesses. An Arab owned business is defined as a business that employs at least one salaried worker and at least one of the owners is Arab and that the majority of the employees in the business are Arabs. Due to this study, only 1.4% of the Arab owned businesses are high-tech businesses, comparing to 7.8% Jewish owned businesses, and 2.89% are in high-tech involved businesses, compared to 15.4% Jewish owned businesses. Overall, there are only 110 Arab owned businesses in the high-tech and high-tech related industries, out of 3,710 total businesses in those industries in Israel. Furthermore, 0.7% of the salary-workers in Arab owned businesses are in high-tech and 2.4% in high-tech related companies, comparing to 14.9% and 15.2% in Jewish owned businesses, respectively. Three fourth of the businesses that were studied in this research mentioned the competitive increase in their industry as a major limiting factor, in addition to other limiting factors such as lack of orders to the local market, lack of professional employees, and difficulties in getting bank credit.

Based on human resource surveys by the Ministry of Economy and Industry in 2007, 2009 and 2011, as displayed in table 1, the difference between Arab and Jewish in the high-tech industry is evident. Although the rate of employed Arabs in the high-tech industry increased from 2007 to 2011, it is still significantly lower than the rate of Jewish employees.

		Total	Jewish	Arabs
2007	Total Employees (in thousands)	2,609.4	2,291.5	317.9
	in the high-tech industry	249.5 (9.6%)	246.3 (10.7%)	3.2 (1.0%)
2009	Total Employees (in thousands)	2,712.6	2,364.3	348.3
	in the high-tech industry	254 (9.4%)	248.9 (10.5%)	5.1 (1.5%)

2011	Total Employees (in thousands)	3,024.7	2,553.8	386.3
	in the high-tech industry	283.2	268.1	7.3
		(9.4%)	(10.5%)	(1.9%)

Table 1: Jewish and Arab Employees in High-Tech Industry

A deeper investigation of 2011 employability in the high-tech industry, by distribution to professional specialty, reveals that the gap is even higher since very few Arabs are specialized in R&D.

	Total	Jewish	Arabs
2011 High-tech Employees (in thousands)	283.2	268.1	7.3
Industry (including pharmaceutical, data processing, electronics, aircraft)	106.9 (37.7%)	98.4 (36.7%)	2.9 (39.7%)
R&D (including computerized services and Research & Development)	123.8 (43.7%)	120.7 (45.0%)	1.5 (20.5%)
Communications	52.4 (18.5%)	48.9 (18.2%)	2.9 (39.7%)

Table 2: Jewish and Arab Specialized High-tech Employees (2011)

In 2011, the Arabs constituted 12.8% of the total employed population in Israel, but only 2.5% of the high-tech industry. Although all high-tech professions are perceived as economic growth engines, the leader in this category is R&D. However, in this sub-category, the Arabs are significantly less represented, comparing to Jewish employees (20.5% and 45.0%, respectively).

Following the understanding that R&D and entrepreneurship increase economic wealth (Hafer, 2013), it is needed to enlarge Israeli-Arabs share in the local and global high-tech industry, both as business owners and as employees. This effort should be made in parallel to improvement of education and especially in the fields of engineering and sciences that will enable Israeli-Arabs to take part in the profitable and fast growing high-tech industry in Israel.

Characteristics of Minority Entrepreneurship

In the current study, we follow the definition of minority entrepreneurs as suggested by Basu (2008): “*minority entrepreneurs are business owners who do not belong to the majority*

population” (p. 582). Although it is frequently used interchangeably with “ethnic entrepreneurship” and “immigrant entrepreneurship”, thus remains open to interpretation (Chaganti and Greene, 2002), we adopt this term and definition since it is best reflecting the characteristics and status of Israeli-Arab entrepreneurs.

With the aim to characterize minority entrepreneurs, there are several aspects to consider, including personal traits, competencies and capabilities, values, and relation with the community. However, there is a big difference between the personal attributes of entrepreneurs, which are common to all of them, either being part of a minority not, and those that are related to the community, which might play a different role for minority entrepreneurs comparing to non-minority entrepreneurs.

Personal traits of entrepreneurs have been widely reviewed in the literature and include a long list of characteristics. For example, Rauch & Frese (2007) use meta-analysis and suggest that the following traits matched to entrepreneurship: self-efficacy, proactive personality, need for achievement, passion to work, tenacity, stress tolerance, goal orientation, need for autonomy, innovativeness, endurance, and flexibility. Staniewski, Janowski, & Awruk, (2016) assess the relationships between personality dispositions of entrepreneurs and indicators of economic small and medium businesses success and found that the five main contributors to economic success are emotional stability, need for achievement, innovativeness, and self-efficacy; resistance to stress; autonomy, disagreeableness, and openness to experience; conscientiousness, internal locus of control, and passion; and risk-taking propensity and authoritative parenting. Driessen & Zwart (2007) use the self-reflection method to scan necessary traits and capabilities for entrepreneurship in different phases, while referring to leadership, creativity, intuition, curiosity, and the ability to see "the big picture". In addition, Lee, Lee, Shim (2016) present a systematic literature review on entrepreneurial competencies, and identified five clusters that include: opportunity competencies, administrative competencies, relationship competencies, personal competencies and commitment competencies.

On the list of entrepreneurial characteristics that may be different for minority entrepreneurs, comparing to non-minority entrepreneurs, we refer to cultural values and relation with the community (Lipset, 2000). As Halabi (2009, הלבי) describes in his study, minority

entrepreneurship is related to culture and many entrepreneurs select a direction of developing specific field that provides advantages based on cultural and societal expertise.

Sriram et al., (2007) present an integrated review of the literature from the USA and Europe pertaining to minority entrepreneurial behavior and achievement. They suggest that motivation to entrepreneurship among minorities is influenced by personal traits and the sub-culture values, thus call for training that will take into consideration the cultural values, historical experience and mindsets. Morris & Schindehutte (2005) studied samples of entrepreneurs from six different ethnic groups operating within a similar environment in Hawaii and found that cultural ethnicity influences value and that values influence managerial practices in entrepreneurial ventures but not entrepreneurial motives. In addition, Gibson et al., (2014) found that African American students have very high entrepreneurial attitudes compared with a validation sample of the EAO (Entrepreneurial Attitudes Orientation), and these attitudes are even higher among those with prior entrepreneurial exposure via a family-owned or self-owned business. However, with reference to previous studies, the authors mention the impact of the community on the students' attitudes and identify serious obstacles that minorities face during the entrepreneurial process, including less education and business experience, limited resources and difficulties in obtaining financing, and fewer mentors and advisors. Those difficulties that are typical to minority entrepreneurial environment are also relevant to Israeli-Arab entrepreneurs, as our study results will show later.

Intentions, Motivations and Barriers in Different Cultures

Several studies that explored factors which impact entrepreneurial intentions found individual and cultural influences, including stigma associated with failure, perceptions of barriers to creation of business startup, risk aversion, attitudes of friends and family, cultural values, supporting administrative infrastructure, and financing difficulties (Carayannis et al., 2003; Lüthje and Franke, 2003; Pittaway and Cope, 2007; Shinnar et al., 2009).

Lüthje and Franke (2003) argue that not all individuals who desire to start a business actually do so, because there is a difference between entrepreneurial intentions and attitudes towards entrepreneurship, and that intention is affected by perceived barriers and support. In their study, based on a survey of 512 students at MIT School of Engineering, they showed that individuals

who were interested in business creation did not go through with it due to negative perceptions of entrepreneurship in their social environment.

Lee and Peterson (2000) examined the entrepreneurial orientation and suggest that it is a result of cultural foundation, moderated by economic, political/legal, and social environmental factors. Thus, entrepreneurs evolve in an entrepreneurial society. Another study, by Giacomini et al. (2011) investigated the intentions, motivations and barriers in the context of countries by comparing entrepreneurship education programs, based on a sample of over 2000 American, Asian and European students. They found that entrepreneurial disposition and intentions differ by country but that motivation and/or discouragements are similar across countries. Similar results were reported by Davey et al., (2016) in their study on regional or national context, in 12 countries in four European regions.

On the other hand, Pruett et al. (2009) examined the impact of cultural, social, and psychological factors on entrepreneurial intentions. They surveyed more than 1,000 students in the USA, Spain and China and found that cultural and social dimensions explain only a small portion of intentions, while psychological self-efficacy (disposition) and expected family support are important predictors.

Rogoff and Heck (2003), in an editorial article on the role of family as a driver for entrepreneurship, claim that “entrepreneurship does not take place in a vacuum. Just as fire is fed by oxygen, entrepreneurship is fed by the oxygen of financial resources, human resources, education, economic conditions, and family” (p. 559).

In the current study, we examine the impact of different factors – drivers and barriers – on the decisions of individuals in the Arab community in Israel towards entrepreneurship. In the following sections, we review the literature to identify factors that influence the decision to become an entrepreneur and factors that impaired entrepreneurial intentions.

Drivers to Entrepreneurship

Individual’s motivation for entrepreneurship by minorities is affected by several factors, including education and skills, cultural values, social networks, family members, ethnic enclaves, opportunity recognition, and availability of resources (Canedo et al., 2014). Although different,

but still similar from other perspectives, female business owners' performance is related to factors of family support, education and experience, networks, demographic, and industrial and financial aspects (Lerner et al., 1997). One of the factors that affects the decision to become an entrepreneur is based on the economic model of the career decision. Thus, individuals decide to be self-employed if the combination of income level, work effort required, risk attitude, and working conditions is correct for them (Douglas & Shepherd, 2000).

Looking into the Arab community in particular, an autoethnography research on cultural determinants of Arab entrepreneurship (Lalonde, 2013) examined the influence of Arab culture on new venture creation from seven perspectives: bluff and dignity, the importance of relationships, group solidarity, the logic of reciprocity, short-term vision and cost management, the family logic, and the influence of Islam. Another study, on the dynamics of breaking out in the Arab manufacturing business sector in Israel, identified family ties, solidarity and reciprocity as influencing factors on Arab entrepreneurship (Drori & Lernery, 2002). In addition, an exploratory quantitative study among 30 small business owners in northern Israel, found that Arab entrepreneurs inclined to be more conservative with regard to the business operation in aspects of economic branch, family ownership, family members' share of the workforce and especially the role of women (Brikk, 2014).

But, family and close community influences are not the only factors that have an impact on entrepreneurial initiatives by minorities. There is also a place to the personal aspect, as presented by Shane et al., (2003) who review the major motivations that prior researchers have suggested, which influence the entrepreneurial process. They mention the need for achievement, risk taking, tolerance for ambiguity, locus of control, self-efficacy, and goal setting. Among the personal traits that influence entrepreneurial intention, self-esteem of entrepreneurs that believe their skills and abilities are adequate to achieve success (Forbes, 2005; Kundu & Rani, 2007; Carland et al., 2015) has received a lot of attention in past studies.

Self-esteem of minority individuals includes group self-esteem, which refers to the feelings of an individual about his/her ethnic group membership, and personal self-esteem, which refers to the feelings of an individual about the self in a comprehensive manner (Porter & Washington, 1993). A study of immigrant entrepreneurs in Canada reveal that social capital, cultural and national identity, acculturation and perceived discrimination are related to entrepreneurs' decisions (Robertson & Grant, 2016). Another research, on first and second-generation immigrant

entrepreneurs in USA found that economic, human, and social capital, together with their degrees of social identification with their ethnic community, impact the decision on entrepreneurship (Ndofor & Priem, 2011).

From another point of view, Wilson et al. (2004) examined motivations for entrepreneurship among school students in USA based on relational motivations, social motivations, and autonomy motivations. They found that boys are significantly more motivated by autonomy, including being one's own boss, being in charge of other people and working by oneself, than girls are. Social concerns, measured by items related to helping others and making the world a better place, serve as motivators for minorities – Hispanic and African-American, and for girls more than for boys. Relational concerns, assessed as being respected by friends and family and working with other people, were found related to ethnic background and gender. A forth driver for motivation, “making lots of money”, was found significant for Hispanic and African-American boys and girls, but among white boys and girls there was a substantial difference.

Edelman et al. (2010) examined black and white people motivation for entrepreneurship by referring to new venture creation as a process based on the effort–performance–outcome model. The authors used the National Panel Study of Entrepreneurial Dynamics (PSED), a longitudinal study of nascent entrepreneurs started in 1998, as dataset for research. Following the six categories of career reasons: self-realization, financial success, roles, innovation, recognition, and independence, suggested by Carter et al. (2002), there was no significant difference between races for motivation to start a new venture. However, Edelman et al. (2010) find significant differences between races for motivation for growing a new venture, when both blacks and whites are motivated by a desire to innovate, whites are also strongly motivated by the desire for financial success.

Contributing factors to entrepreneurship, therefore, include an array of elements that can be classified into personal characteristics, family-related and community-related influences, as well as economic and societal impact. While there is no difference between entrepreneurs in general and ethnic or minority entrepreneurs, with regard to the personal dimension, there are differences on entrepreneurial behavior when considering close-environmental factors.

Barriers to Entrepreneurship

Barriers to entrepreneurship can be classified into personal issues and institutional or organizational factors. Among the personal issues, we can identify psychological barriers such as aversion to risk, fear of failure, aversion to stress and hard work (Taormina & Kin-Mei, 2007; Sandhu et al., 2011) as well as lack of confidence, personal problems, lack of skills and time constraints (Hatala, 2005).

Although those are important factors that impair entrepreneurship, we find the institutional or social issues, more relevant to the study on barriers to entrepreneurship among Israeli-Arabs. Among the institutional barriers, we can identify barriers such as lack of resources and lack of social networking (Taormina & Kin-Mei, 2007; Sandhu et al., 2011) as well as lack of government assistance, lack of funds, infrastructure issues, lack of training, poor contract and property laws and corruption (Kiggundu, 2002). In their book on women entrepreneurship, Gould and Parzen (1990) refer to the following barriers to entrepreneurship: lack of socialization to entrepreneurship in the home, school and society; exclusion from traditional business networks; lack of access to capital and information; discriminatory attitudes of lenders, gender stereotypes and expectations; socialized ambivalence about competition and profit; and lack of self-confidence. In a study on ethnic minority businesses, Carter et al (2015) refer to finance, access to market, managerial skills, and human capital as the major barriers to success. It can be seen, that in several previous papers, a focus was given to financial-related barriers for minority and gender entrepreneurship (Koellinger & Minniti, 2006; Roper & Scott, 2009). Floman (2015) reviews the activities related to Israeli-Arabs employment in the high-tech industry, based on interviews and case studies, with a special emphasis on the financial aspect and its impact on sense of belonging.

Another important factor is related to the social environment, as discussed by Phizacklea and Ram (1996) when comparing ethnic minority businesses in France and UK. They found that ethnic minority group members prefer to work and do business with family and co-ethnics because of trust and respect that are shaped by a hostile environment. Another perspective on the role of social environment on ethnic entrepreneurship is presented by Assudani (2009) in a study on in-group ties within ethnic groups. The findings imply that those ties facilitate, but also constrains entrepreneurs. Hence, social networking is an additional vital factor in building a new venture and it usually connected to lack of funds and financial support.

In this study, we will focus on the institutional and organizational barriers that prevent or slowdown entrepreneurial activities by Israeli-Arabs.

Summary of Literature Review

The social and economic role of entrepreneurship in general and in high-tech entrepreneurship in particular is well-established in previous studies (Levenstein, 2004; Thurik & Wennekers, 2004; Wong et al., 2005; Edelman et al., 2010; Hafer, 2013) and is well-supported by statistical data on the Israeli economy. However, the Arab community in Israel plays only a minor role in this arena, hence does not fully enjoy from the benefits entrepreneurship (חביב, 2008; רמזיס, 2015).

The literature review reveals that minority entrepreneurship is influenced not only by personal and individual characteristics of entrepreneurs, but also by social and cultural circumstances related to the family, the community and the institutional infrastructure (Carayannis et al., 2003; Lüthje and Franke, 2003; Pittaway and Cope, 2007; Shinnar et al., 2009). Previous studies on the factors affecting minority entrepreneurial intentions, motivations and barriers, which were conducted in different communities around the world, are presented to provide a wide understanding of the potential factors that influence high tech entrepreneurship among Arabs in Israel.

A previous study on Israeli high-tech entrepreneurs (Malach-Pines et al., 2004) focused on personal and professional backgrounds, suggested that “the median successful Israeli entrepreneur is male, in his mid-forties, with technical education, a technical profession and an academic degree, who served in the army as an officer in either combat or technical position and is the first born in a small family of two or three children”. This description of the typical Israeli entrepreneur is interesting, but fails to include Israeli-Arab entrepreneurs. In this research, we aim not only to describe Israeli-Arab entrepreneurs, but also to analyze the personal, familial, communal and municipal perspectives of entrepreneurship in the Israeli-Arab community.

Research Questions

This study explores several perspectives of the motivating factors and the barriers related to Arab entrepreneurs in Israel. In addition to the personal traits of entrepreneurs, which includes self-efficacy, creativity, curiosity, proactive personality, and need for achievement (Driessen and Zwart, 2007; Rauch and Frese, 2007), based on the literature review, we propose the following hypotheses (H).

Social and financial success and rewards were identified as strong personal motivators for entrepreneurship (Douglas & Shepherd, 2000; Wilson et al., 2004; Edelman et al., 2010) that affect the decision to become entrepreneur. But, this decision is also influenced by the social and economic environment in which the entrepreneurs work (Lee and Peterson, 2000; Rogoff and Heck, 2003). Thus, we suggest that for Arabs in the Israel,

H1. Improvement of personal socio-economic status is a motivator for entrepreneurship.

H2. Improvement of community socio-economic status is a motivator for entrepreneurship.

Nevertheless, minority entrepreneurs face difficulties in getting support from their community (Hsieh & Shannon, 2005; Easterby-Smith et al., 2012) gaining financial resources and being involved in the social-economic network (Gould and Parzen, 1990; Taormina & Kin-Mei, 2007; Sandhu et al., 2011; Carter et al., 2015). In addition, missing national policy that promotes governmental and institutional infrastructure for minority entrepreneurship (Kiggundu, 2002; Ram and Smallbone, 2003) adds to those difficulties. Thus, we suggest that for Arabs in Israel,

H3. Lack of immediate environment support is a barrier to entrepreneurship.

H4. Lack of economic and financial resources is a barrier to entrepreneurship.

H5. Lack of professional network is a barrier to entrepreneurship.

H6. Lack of institutional/governmental support is a barrier to entrepreneurship.

The following sections describe the quantitative and qualitative methodologies we used in this research, including a survey, semi-structured interviews, and a case study analysis, as well as the findings and results of the study.

Methodology

This study provides a wide-perspective investigation on entrepreneurship in the Israeli-Arab community. In order to examine this topic from several standpoints, including personal, family, and community perspectives, we used three different research tools: (1) a survey among Israeli-Arabs involved in entrepreneurship in the high-tech industry, (2) semi-structured interviews with Israeli-Arab and Jewish entrepreneurs and leaders in the high-tech industry, and (3) a case study on developing the high-tech industry in the municipality of Nazareth. In this mixed methods approach, as explained by Creswell (2003), we employ strategies of inquiry that involve collecting numeric and text data simultaneously, to best understand research topic by using a final dataset that includes both quantitative and qualitative information.

In the following sections we describe each one of the research methods we used in this study.

Survey

We used a questionnaire which was developed based on Shinnar et al. (2012) to study entrepreneurial perceptions and intentions as well as motivations and barriers to entrepreneurship from a personal perspective of Israeli-Arabs. The questionnaire, which was validated by its developers, and used for analysis in different places in the world, includes Likert scales to assess entrepreneurial disposition and demographic variables.

In order to adjust the original questionnaire to the current research population, it was translated to Hebrew and Arabic. The questionnaire was translated from English by one of the researchers and back-translated to English by the other researcher to assure accuracy. The translated versions were then reviewed and compared to the original questionnaire, by an independent professional. Following this procedure, we guaranteed that the translated versions are correctly represent the original developed questionnaire.

The questionnaire included four parts. The first part was composed of seven questions related to perception of entrepreneurship and the encouragement by the various cycles of society including family, university, and the state. The second part consisted of sixteen items that evaluated the perceived importance motivators for entrepreneurs and the third part included twenty items that assessed the perceived importance of barriers to entrepreneurship. Both parts were measured on a five-point Likert scale where responses ranged from “1” being “very unimportant” to “5” being

“very important.” The fourth part was based on six items that considered the perceived support to entrepreneurship, and entrepreneurial intentions. In addition, respondents were asked to provide demographic data such as gender, age, and education.

The study was conducted on August-November 2016. Questionnaires were distributed electronically to a population of 93 Israeli-Arabs who are involved in the high-tech industry, including university and college graduates, entrepreneurs, mentors, and employees, and yielded a response rate of 79%, i.e., 73 completed surveys.

Interviews

For the purpose of capturing the exploratory nature of the study, we used a qualitative analysis based on semi-structured interviews. This method enabled us to gain better understanding of the deeper interpretations and insights of Israeli-Arab and Jewish high-tech employees and entrepreneurs on the interests, motivations and barriers.

The constructive approach was previously used in studies on entrepreneurship which were aimed to provide an understanding of the relationship between social orders and careers (Leitch et al., 2010; Omair, 2010; Shaw & Carter, 2007; Tlaiss, 2015). Since entrepreneurship is a practice-based discipline, it is important to examine it in its context where rich and broad information can be gathered and interpreted. In the examination of the dynamic learning perspective of entrepreneurship, Cope (2005) suggests that the purpose of interpretivist research is "to develop 'bottom-up' interpretive theories that are inextricably 'grounded' in the lived-world" (p. 167).

In this study, we used the semi-structured interview method which enabled us to be flexible on one hand and to provided sufficient structure addressing specific dimensions of the research questions on the other hand. This method leaves space for the interviewees to offer new insights and directions of thought that can be later expanded (Cohen & Crabtree, 2006). We interviewed not only successful Israeli-Arab entrepreneurs but also stakeholders involved in the integration of Israeli-Arabs in the high-tech industry. We conducted 16 open-ended and semi-structured interviews with Arab (10 interviews) and Jewish (6 interviews) people who are involved in high-tech entrepreneurial activities, from different perspectives (entrepreneurs, business owners, investors, and consultants). The interviews focused on different topics such as knowledge and training for entrepreneurs, financing, education, family and community support, networking,

preferred field for entrepreneurial activity, motivators and barriers to starting a startup. Detailed notes were taken and the transcriptions were analyzed by the researchers using summative content analysis approach based on grounded theory where categories and themes emerge during the analysis (Hsieh & Shannon, 2005; Easterby-Smith et al., 2012).

Case Study

The case of the city of Nazareth is applied to study the complex phenomena of developing high-tech entrepreneurship in the Arab community in Israel within its context. According to Yin (2003) a case study approach is appropriate when the study is focused on “how” and “why” questions, the researchers cannot manipulate the behavior of the study subjects and want to cover relevant contextual conditions while the boundaries between the phenomenon and context are not clear. We used a single case which is categorized by Yin (2003) as holistic exploratory as it used to explore situations in which the intervention being evaluated has no clear, single set of outcomes, and it is categorized by Stake (1995) as intrinsic as it illustrates a particular situation that is of interest for the purpose of this study.

The city of Nazareth is located in the Lower Galilee in the north of Israel. It is the biggest Arab city in Israel with more than 75,000 citizens, and it constitutes the center of a metropolis, which includes the villages of Yafia, Rayna, Eilut, Kfar Kana, Mashhad, Ein Mahel, and Exal. The combined population of this area is about 200,000 residents, one tenth of all the Arab citizens of Israel. Since 2008, Nazareth municipality and Tsofen, an Arab-Jewish organization promoting the integration of Israeli-Arab Citizens into its high-tech industry through employment and creation of high-tech centers in Arab towns, advance the development of Nazareth as a high-tech leader area that will be served as the gate to high-tech entrepreneurship for Israeli-Arabs.

When this project started, in 2008, there were only 350 Israeli-Arab high-tech employees. Five years later, in 2013, this number grew to 1,200, and in 2016 there are 3,200 Israeli-Arabs employed in the high-tech industry. Although the number of high-tech entrepreneurs is not officially published, it is currently estimated by people from the industry at about 300, which is a steep increase comparing to the status less than a decade ago.

The case of developing the high-tech industry in Nazareth is based on several major tracks such as presence of global leading companies, training for students and graduates, establishment of a

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new high-tech area, governmental support for startups, and more. All those activities aimed to increase involvement of Israeli-Arabs in the local and global high-tech industry, and especially to promote entrepreneurial high-tech activities. This case serves as a successful model which was also later duplicated to Kafr Qasim, in the center of Israel.

The Nazareth case was studied through multiple sources, including official data published by the Israeli Central Bureau of Statistics and other governmental agencies, information provided by the municipality of Nazareth, and data collected by Tsofen professional team throughout the work in Nazareth in the last nine years.

Results & Findings

The following sections summarize the results and findings collected from the survey, interviews and statistical data.

Survey Sample Population

The survey was distributed electronically to 93 Israeli-Arabs who are in contact with Tsofen, an organization facilitating integration in a variety of jobs in the Israeli high-tech industry. 73 respondents (79% response rate) completed the survey, including 64 men (87.7%) and 9 women (12.3%). 46.6% of the respondents are in the age of 21-29, 42.5% are between 30 and 45, 4.1% are less than 20 years old, and additional 6.8% are in the age of 45.-60.

Concerning education, 2.7% graduated vocational high school, 4.1% are full matriculation certificate holders, while most of the respondents are undergraduates (74%), 16.4% hold second degree, and additional 2.7% own PhD degree.

Descriptive Statistics

First, we present the background characteristics of the respondents with regard to high-tech entrepreneurship and career preferences. The participants were asked about their level of knowledge on initiating a startup and their self-definition as entrepreneurs. The following table (N=73) shows the results.

	<i>Scale</i>	<i>M</i>	<i>SD</i>	<i>Min</i>	<i>Max</i>
Level of knowledge in terms of starting your own business	1-4	2.64	1.00	1.00	4.00
Self-definition as an entrepreneur, full of ideas and initiative to start your own business	1-7	4.82	1.71	1.00	7.00

Table 3: Level of Knowledge on Initiating a Startup and Self-Definition as Entrepreneurs

The above results imply that there is a medium-high level of knowledge on entrepreneurship and initiating a startup (average 2.64 on a 1-4 scale) and an average high level of self-definition as a high-tech entrepreneur (average 4.82 on a 1-7 scale).

In addition, the participants were asked about their aspiration for future employment. The following table (N=73) presents the distribution of answers.

<i>Aspiration for future employment</i>	<i>%</i>	<i>N</i>
Public administration	1.4%	1
Global organization	34.2%	25
Large enterprise	8.2%	6
Small to medium size business	4.1%	3
Family business	2.7%	2
My own business	49.3%	36

Table 4: Inspirations for Future Employment

Most of the respondents (49.3%) aspire to be self-employed, working in their own business, and many others (34.2%) aspire to be employed in global organizations.

Then, the participants were asked to what extent they feel that the university, the state and the family stimulate them to start their own startup, using a scale of 1-4, where 1=not at all and 4=greatly. The following table (N=73) presents the results.

<i>Factor</i>	<i>M</i>	<i>SD</i>	<i>Min</i>	<i>Max</i>
The university	2.32	0.97	1.00	4.00
The state	2.34	0.88	1.00	4.00
The family	2.66	0.94	1.00	4.00

Table 5: Factors Stimulate Establishment of Startups

The results indicate that all factors: the university, the state, and the family are perceived as factors stimulating establishment of startups. The perception of the family as the most

encouraging factor for establishment of startup might be surprising when considering a traditional society, though following examination that will be presented in the following sections, might provide explanation.

The next table (N=73) shows additional responses on participants personal and close environment experience and support to establish startups.

<i>Question</i>	<i>Answers</i>	<i>%</i>	<i>N</i>
Have you ever thought about starting a startup?	No, never	9.6%	7
	Yes, vaguely	47.9%	35
	Yes, seriously	28.8%	21
	Yes, I have a definite plan to start my own startup	13.7%	10
Is there someone in your immediate circle who has started his or her own startup in the last three years?	No	52.1%	38
	Yes	47.9%	35
How would your family react if you decided to start your own startup?	Would be indifferent	28.8%	21
	Would prevent me from doing it	4.1%	3
	Would encourage me to do it	67.1%	49
Do you have professional or other work experience?	No	19.2%	14
	Yes	80.8%	59
Is there an entrepreneur in your immediate family?	No	78.1%	57
	Yes	21.9%	16

Table 6: Distribution of Attitudes Towards Establishment of Startups

The above results show that the majority of respondents have thought about starting a startup at some level. About half of them had a vague idea (47.9%), additional one third thought about it seriously (28.8%), and 13.7% have a specific plan to start their business. About half of the respondents report that somebody in their close environment has started his or her own startup in

the last few years (47.9%) and more than two third believe that their family will encourage them to start their own startup (67.1%), even though there is no entrepreneur in their immediate family.

Inferential Statistics

Motivations and barriers to starting a startup

The respondents were asked to rate the importance of sixteen motivations for starting a startup, using a scale of 1 to 5, where 1=very unimportant and 5= very important. The following table (N=73) presents the results from the most important motivation to the least important perceived motivation.

<i>Motivations</i>	<i>M</i>	<i>SD</i>
The chance to implement my own ideas	4.52	0.93
Creating something of my own	4.48	0.88
Personal independence	4.27	0.97
The opportunity to be financially independent	4.22	1.05
Improving my quality of life	4.01	1.19
Building personal wealth	3.96	0.99
Creating jobs	3.82	1.15
Wanting to make more money than by working for wages	3.68	1.05
Being at the head of an organization	3.51	1.27
Receiving fair compensation	3.41	1.32
Dissatisfaction in a professional occupation	3.26	1.29
Managing people	3.14	1.24

Gaining high social status	3.00	1.42
Having more free time	3.00	1.37
The difficulty of finding the right job	2.92	1.32
Following a family tradition	2.25	1.18

Table 7: Motivations for Starting a Startup

The figures in the above table reveal that the motivations that are perceived as the most important are "the chance to implement my own ideas", "creating something of my own", "personal independence", "the opportunity to be financially independent", and on the fifth place "improving my quality of life". The motivations that are perceived as the least important are "following a family tradition", "the difficulty of finding the right job", "having more free time", and "gaining high social status".

In addition, the respondents were asked to rate the importance of twenty barriers to starting a startup, using a scale of 1 to 5, where 1=very unimportant and 5= very important. The following table (N=73) presents the results from the most important barrier to the least important perceived barrier.

<i>Barriers</i>	<i>M</i>	<i>SD</i>
Lack of initial capital	3.89	1.18
Current economic situation	3.84	1.11
Excessive risk	3.78	1.12
Lack of knowledge of the business world and the market	3.59	1.22
Fiscal charges (taxes, legal fees, etc.).	3.58	1.18
Lack of a high level of entrepreneurial competence	3.55	1.20
Lack of knowledge	3.45	1.20
Irregular income	3.44	1.17
Lack of organizations to assist entrepreneurs	3.38	1.16

Lack of formal help to start a business	3.34	1.19
Lack of available assistance in assessing business viability	3.32	1.09
Lack of ideas regarding what business to start	3.27	1.39
Startup paperwork and bureaucracy	3.22	1.35
Lack of legal assistance or counseling	3.19	1.26
Fear of failure	3.16	1.37
Lack of support from people around me (family, friends, etc.)	2.93	1.36
Lack of experience in management and accounting	2.92	1.17
Having to work too many hours	2.89	1.25
Doubts about personal abilities	2.89	1.30
Problems with employees/contracted personnel	2.64	1.12

Table 8: Barriers to Starting a Startup

The figures in the above table reveal that the barriers that are perceived as the most important are "lack of initial capital", "current economic situation", "excessive risk", "lack of knowledge of the business world and the market", and "fiscal charges (taxes, legal fees, etc.)". The barriers that are perceived as the least important are "problems with employees/contracted personnel", "doubts about personal abilities", "having to work too many hours", "lack of experience in management and accounting", and "lack of support from people around me (family, friends, etc.)".

In the next step of analysis, we used principle component analysis factor analysis with Varimax method rotation for statements on motivations and barriers, to create groups of similar contents. The factor analysis of motivations for starting a startup revealed five factors that explain about 71% of the overall variance, as presented in the following table (N=73).

<i>Motivations</i>	Factors loading*				
	<i>Factor 1</i>	<i>Factor 2</i>	<i>Factor 3</i>	<i>Factor 4</i>	<i>Factor 5</i>

The chance to implement my own ideas	0.88		
Creating something of my own			0.41
Personal independence	0.79		
The opportunity to be financially independent	0.71		
Improving my quality of life		0.65	0.46
Building personal wealth		0.69	
Creating jobs			0.80
Wanting to make more money than by working for wages		0.86	
Being at the head of an organization		0.88	
Receiving fair compensation	0.66		
Dissatisfaction in a professional occupation	0.80		
Managing people		0.89	
Gaining high social status		0.53	0.42
Having more free time			0.63
The difficulty of finding the right job	0.78		
Following a family tradition	0.57		

* presenting factors loading higher than 0.4

Table 9: Factor Analysis with Varimax Rotation: Motivations for Starting a Startup

Based on factor analysis results and following previous study (Giacomin et al., 2011), the sixteen motivators were grouped into five categories: (1) desire for independence, $\alpha=0.79$; (2) professional dissatisfaction, $\alpha=0.75$; (3) pursuit for profit and social status, $\alpha=0.78$; (4) personal development, $\alpha=0.76$; (5) creation, $\alpha=0.54$.

Alfa Cronbach reliability test of the overall motivations to starting a startup, composed of sixteen items, was found to be relatively high, at a level of $\alpha=0.85$.

The factor analysis of barriers to starting a startup yielded five factors that explain about 68% of the overall variance, as presented in the following table (N=73).

<i>Barriers</i>	Factors loading*				
	<i>Factor 1</i>	<i>Factor 2</i>	<i>Factor 3</i>	<i>Factor 4</i>	<i>Factor 5</i>
Lack of initial capital				0.73	0.46
Current economic situation				0.59	0.42
Excessive risk					0.80
Lack of knowledge of the business world and the market	0.48	0.58			
Fiscal charges (taxes, legal fees, etc.).				0.81	
Lack of a high level of entrepreneurial competence					0.67
Lack of knowledge		0.67			
Irregular income			0.58		
Lack of organizations to assist entrepreneurs	0.89				
Lack of formal help to start a business	0.88				
Lack of available assistance in assessing business viability	0.55	0.44			
Lack of ideas regarding what business to start		0.85			
Startup paperwork and bureaucracy	0.41			0.63	
Lack of legal assistance or counseling	0.87				

Fear of failure	0.57	0.45
Lack of support from people around me (family, friends, etc.)	0.53	
Lack of experience in management and accounting	0.62	
Having to work too many hours	0.76	
Doubts about personal abilities	0.76	
Problems with employees/contracted personnel	0.81	

* presenting factors loading higher than 0.4

Table 9: Factor Analysis with Varimax Rotation: Barriers to Starting a Startup

Based on factor analysis results and following previous study (Giacomin et al., 2011), the twenty barriers were grouped into five categories: (1) lack of support structure and fiscal and administrative costs, $\alpha=0.87$; (2) lack of knowledge and experience, $\alpha=0.84$; (3) lack of confidence, $\alpha=0.72$; (4) economic climate and lack of entrepreneurial competencies, $\alpha=0.78$; (5) risk aversion, $\alpha=0.70$.

Alfa Cronbach reliability test of the overall barriers to starting a startup, composed of twenty items, was found to be relatively high, at a level of $\alpha=0.89$.

The following tables (N=73) present the measures of central tendency and variability for the five motivation and barriers categories.

<i>Category</i>	<i>M</i>	<i>SD</i>	<i>Min</i>	<i>Max</i>
Desire for independence	4.33	0.88	1.33	5.00
Professional dissatisfaction	2.95	0.97	1.00	4.75
Pursuit for profit and social status	3.21	1.09	1.00	5.00
Personal development	3.88	0.89	1.67	5.00
Creation	3.76	0.82	1.33	5.00

Motivations – general	3.59	0.64	1.75	4.63
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Table 10: Categories of Motivations for Starting a Startup

<i>Category</i>	<i>M</i>	<i>SD</i>	<i>Min</i>	<i>Max</i>
Lack of support, fiscal and administrative costs	4.33	0.88	1.33	5.00
Lack of knowledge and experience	2.95	0.97	1.00	4.75
Lack of confidence	3.21	1.09	1.00	5.00
Economic climate and lack of competencies	3.88	0.89	1.67	5.00
Risk aversion	3.76	0.82	1.33	5.00
Barriers – General	3.59	0.64	1.75	4.63

Table 11: Categories of Barriers to Starting a Startup

The above table on categories of motivations shows that, in average, the respondents perceive the desire for independence as the lead motivator for starting a startup, followed by personal development and creation. These results indicate that the main motivation factors for entrepreneurship are development of creative ideas and improvement of the socio-economic status.

The table on categories of barriers shows that, in average, the respondents perceive the economic climate and lack of competencies as the main barrier to starting a startup, followed by risk aversion and lack of support structure and fiscal and administrative costs. *These results indicate that a critical barrier to entrepreneurship is lack of institutional and governmental support.*

Family Support, Networking and Entrepreneurship

The relationship between family support and selection of entrepreneurial career was examined with Chi-squared test. The results show that *there are no significant differences in respondents'*

willingness to start a new startup and family support (from prevention to encouragement) ($\chi^2(6) = 4.23, p > .05$). The following table presents the results.

<i>Starting a startup</i>	<i>Never</i> N=7		<i>Yes, vaguely</i> N=35		<i>Yes, seriously</i> N=21		<i>Yes, definite plan</i> N=10	
<i>Family Reaction</i>	%	N	%	N	%	N	%	N
Prevention	14.3%	1	5.7%	2	-	-	-	-
Indifference	28.6%	2	28.6%	10	23.8%	5	40.0%	4
Encouragement	57.1%	4	65.7%	23	76.2%	16	60.0%	6

Table 12: Relationship between Family Support and Starting a Startup

Even when the categories of starting a startup were grouped into dichotomic measure (yes/no), no significant differences were found in the distribution of responses regarding family support and starting a startup ($\chi^2(1) = 2.06, p > .05$). An additional Spearman's rank correlation coefficient was tested between the variables, but no significant relationship was found between family support and willingness to start a startup ($r_s = 0.08, p > 0.05$).

The relationship between networking, expressed in acquaintance with family and friends involved in entrepreneurial activities, and selection of entrepreneurial career was examined with Chi-squared test. The test results show that *there are no significant differences in respondents' willingness to start a new startup and networking* ($\chi^2(3) = 1.64, p > .0$). The following table presents the results.

<i>Starting a startup</i>	<i>Never</i> N=7		<i>Yes, vaguely</i> N=35		<i>Yes, seriously</i> N=21		<i>Yes, definite plan</i> N=10	
<i>Entrepreneurs' Network</i>	%	N	%	N	%	N	%	N
No	71.4%	5	51.4%	18	52.4%	11	40.0%	4
Yes	28.6%	2	48.6%	17	47.6%	10	60.0%	6

Table 12: Relationship between Networking and Starting a Startup

Even when the categories of starting a startup were grouped into dichotomic measure (yes/no), no significant differences were found in the distribution of responses regarding acquaintance with entrepreneurs in the close environment and starting a startup ($\chi^2(1) = 0.26, p > .05$).

Demographic status and Entrepreneurship

The relationship between demographic status and motivation and barriers to starting a startup was examined with relation to age, education and gender. A significant positive Pearson's correlation coefficient was found between the barriers' categories of lack of support structure and fiscal and administrative costs ($r= 0.24, p<.05$) and lack of confidence ($r= 0.23, p<.05$). A significant positive Pearson's correlation coefficient was also found between the level of education and the motivation category of desire for independence ($r= 0.29, p<.05$). However, no gender differences were found to be related to the motivations or barriers to start a startup. Hence, *it can be concluded that older and more educated Israeli-Arabs, men and women, tend to start their own startups and become entrepreneurs.*

Semi-Structured Interviews Data Collection and Analysis

Semi-structured interviews were conducted with 16 (10 Arabs and 6 Jews) people who are involved in high-tech entrepreneurial activities. The interviewees were entrepreneurs, business owners, investors, and consultants (12 men and 4 women). The purpose of interviewing a variety of stakeholders, at different levels of involvement, was to gather data from some different perspectives and to enhance the trustworthiness and rigorousness of the data collected. All participants were told of the purpose of the study and were assured of confidentiality.

Each interview was conducted in a personal meeting with the researchers, in an unofficial environment to provide a supportive and open environment for conversation. The interviews were performed in Hebrew and lasted between 45 and 60 minutes. The researchers made notes during the interviews and where permission was granted, the interview was digitally recorded and later transcribed. The transcripts were done in Hebrew and then translated into English by the researchers and cross-validated by an expert in both languages to ensure the accuracy of translation.

Prior to the interviews, the researchers identified in the literature several topics that were further explored and expanded during the interviews. Those topics included knowledge and training for Israeli-Arab entrepreneurs, motivators and barriers to starting a high-tech enterprise in Israel, financing sources and procedures, the role of education, family and community support, and

networking in starting a new high-tech startup, and preferred fields for entrepreneurial activity by Israeli-Arabs.

The data collected was analyzed and repeated terms and concepts were retained and then categorized into specific themes, as presented hereinafter.

1. Prior knowledge and training for high-tech entrepreneurship

Young Israel-Arabs, comparing to young Israeli-Jews, are not well-acquainted with education opportunities, especially in the higher education arena. For example, one of the respondents said: *"before I started my studies in the college I didn't know what is the difference between information systems and healthcare systems. . . thus, did not have any real preference. Only when I was in college, almost at the end of my first year there, I realized that I am interested in a different field than the one I am enrolled to . . . "*

Higher education studies in all fields, including engineering, computer sciences and exact sciences are mainly based on theoretical understanding, thus do not provide relevant knowledge for young people who wish to join the high-tech industry. Additional training on technical issues is compulsory for entering the industry, even at the very beginning positions. Although this is true to all students, it has more impact on Israeli-Arabs who cannot acquire the experience and practical knowledge anywhere else.

2. Motivation for becoming an entrepreneur

The primary motivator to become an entrepreneur in the high-tech industry is financial compensation. This motivator was mentioned by all the interviewees - entrepreneurs, business owners, investors, and consultants - as the main factor to starting a startup.

The interviewed entrepreneurs added to this prime motivator, the factors of interest and personal development. They said that even though they knew entrepreneurship is demanding, especially during the initial phases, they had strong self-confidence that they will be able to do something new. They wanted to challenge themselves with something that they are interested in and which will keep them on a track of learning and development. However, many of the interviewees described the career path of a successful entrepreneur as one that starts with employment in a global high-tech company, where they can learn and experience the high-tech industry before starting their own venture.

It is worthwhile to mention that none of the interviewees mentioned family or community appreciation as a motivator. On the opposite, as one of them expressed it as follow: *"For my*

immediate environment, a successful businessman will have a big car and many employees. I knew I would not be able to satisfy those expectations, and yet decided to take this direction". They also indicated that the motivation was purely personal, with minor intentions to make a social or economic change in their society.

3. Barriers to starting a new startup

The major barrier to starting a new startup is financial support. From the financial aspect, Arabs in Israel cannot access all the funds and an Arab entrepreneur usually required to self-finance more than his or her Jewish colleague. Difficulties in accessing investment funds are also related to networking. Investors tend to invest in entrepreneurs that are like them and that they can ask around, in their close network, about them. The Israeli entrepreneurship network is totally dominated by Jewish investors and serial entrepreneurs who don't know the Arab community, thus are not really accessible to Arab entrepreneurs.

From another angle, Arab entrepreneurs prefer to receive investments from Arab investors, to employ Arabs and to develop products that are aimed at Arabs in order to be accepted in their community as loyal. One of the interviewed entrepreneurs stated: *"People around me said that they expect to me to honor the tradition by keeping my involvement only in the Arab community"*. The Arab investors, on the other hand, refrain from investments in high-tech since, as one of them explained: *"we afraid from risk and failure. We prefer to have small profits over long period in businesses we can understand"*.

In addition, experience in the high-tech industry is perceived as a critical factor before starting a startup. Thus, many employees choose to work for a few years in a local startup or in a global high-tech company, before starting their own startup. However, the entrance is not easy because, as one of the interviewees described the situation: *"most of us do not know somebody at the high-tech industry, and even if we do, it is not common to ask for help from somebody who is not one of your close family members"*. Another aspect of weak networking was mentioned by the consultants, as one of them said: *"volunteering is not a value in our society, so even the successful entrepreneurs do not see why they should help other people enter the industry. It is not their duty and they will not be valued for that"*.

Other barriers are related to the community expectations. Graduated Israeli-Arabs are expected to be employed in the profession they acquired and it will not be well perceived if they will find a temporary job. Thus, the pressure is high from the very early stages of the

professional career, and many young people decide not to start this demanding route. The Israeli-Arab community appreciates professional and practical studies such as medicine, pharmaceutical and education. For many years, computer sciences and engineering studies were not perceived as valuable as the other academic professional fields. However, in the last few years, there is a transition to academic professions such as bio-technology that integrate both fields. One of the interviewees explained: *"when I arrived to the university exchanged information system studies with my original enrollment to medicine, but for more than a year I was afraid to tell it to my father . . . today, my cousin studies computer science in the university and get her father's support"*.

On top of that, for Israeli-Arab women entrepreneurs, there is an additional factor that cause the society to discourage them from selecting this direction. Working in startups requires continuous investment of many hours, which perceived as contradictory to the traditional role of women who are expected to be at home, raise children, manage the house, and most of the times to work with other women.

4. Differences between Arab and Jewish entrepreneurs

There are several important gaps between the Arab and Jewish communities with regard to entrepreneurship, which the interviewees referred to.

On the financial aspect, the set of opportunities that are open to Jewish entrepreneurs is much wider than the one that is available for Israeli-Arab entrepreneurs, as explained above.

On a strategic level, many of the Israeli entrepreneurs started their journey in this field during their military service. They not only acquired knowledge and indispensable experience which is prevented from Israeli-Arabs that are not joining the army, but also can be involved in later stages of their professional development in initiatives that are related to security and defense, either financed by the government or by other public bodies, which are not accessible to Israeli-Arabs.

On the cultural level, Israeli-Arabs many times are discriminated in job interviews not because they are not wanted by local or global companies, but because their cultural background does not allow them to present themselves as determined and successful as expected and they do not feel comfortable to state all their advantages and superiorities. Because of this cultural difference, Jewish candidates are usually prioritized over their Arab

colleague, and the consultants identified training on cultural attitudes as a critical success factor in the process of preparation to the labor market.

Nazareth Case Study Analysis

The development of entrepreneurship and high-tech employment in the Arab community are promoted by several parallel initiatives, including education, training, and establishment of facilities that support businesses and employability.

Academics are considered to be change agents of social, political and economic development. Thus, education in general, and higher education in particular, is prioritized by Israeli-Arabs. Between 2012 and 2015 there was a massive increase (57%) of Israeli-Arab students enrollment to technology, engineering and sciences academic studies. The Technion – Israel Institute of Technology - is a science and technology research public university in Haifa, Israel, that serves as the main higher education institution in the fields of engineering and technology, located in the north of Israel. The Technion proactively supports integration of Arab students and reports on positive trends in the decreasing number of dropouts (73% dropout of Arab students in 1985, 30% dropout in 2000, and 12% dropout in 2016), in the percentage of Arabs among first-degree students (estimated at about 10% in 2005, 20% in 2016), and in the percentage of Arab women students (45% of the overall Arab students, higher than the percentage of Jewish women students of the overall Jewish students).

Training for Israeli-Arabs is offered by several non-governmental, non-profit organizations, amongst which Tsofen is a leader. According to Tsofen statistics for 2015, 80 high-tech Arab graduates participated in 5 training courses, and 36 of them already started to work in high-tech companies. In addition, Tsofen facilitated 209 placements of high-tech employees, including 156 (75%) men and 53 (25%) women.

The following table presents the increase in high-tech employment in Nazareth between 2008 and 2016.

		<i>2008</i>	<i>2016</i>
National	Arab employment in high-tech	350	3,000
Nazareth	High-tech jobs in Nazareth	30	900

High-tech companies in Nazareth	1	>20
International companies in Nazareth	0	4
% women in high-tech in Nazareth	N/A	25%

Table 13: High-Tech Employment in Nazareth 2008-2016

The increase in Arab employment in high-tech from 350 in 2008 to 3,000 in 2016 is significant and impacts all the Arab community. However, the increase in Nazareth area is even more substantial, where the number of high-tech jobs grew from 30 in 2008 to 900 in 2016 (3000%), including 100 Jews and 800 Arabs. As the numbers above show, Nazareth have changed the employment scene with the entrance of many high-tech local and international companies. This change was feasible thanks to a policy that encouraged individuals on one hand and supported businesses in the process of establishing branches and ventures in a new high-tech industrial park.

Both Nazareth mayor, Mr. Ali Salam, and the Founder of ISCAR, Mr. Stef Wertheimer, are promoting the implementation of this policy by providing a professional environment.

The Nazareth industrial park is aimed "not only to serve as a center for the growth and generation of industrial companies, but to create a local community of Arab-Jewish entrepreneurs and industrialists through vocational training and entrepreneurship courses. The park will also serve as a regional center of business and cultural activity for all the residents of the region" (www.iparks.co.il). The park hosts high-tech companies including global companies – Amdocs and Microsoft – that operate R&D centers and employ dozens of engineers; Arab owned high-tech companies - Alpha-Omega, specialized in neuroscience research and functional neurosurgery, and Bradcom, a global semiconductor leader; MEET- an educational initiative for Arab and Jewish young leadership, and a few more businesses. The current (2016) estimation of Arab-owned high-tech startups is about 70, and additional 30 startups are expected to be initiated next year (2017).

In order to support this trend, the successful model of Nazareth have expanded to the Triangle Region of Israel, where Tsofen has established the TRI/O Tech, an entrepreneurship center that includes an entrepreneurship school and an accelerator in Kafr Qasim. This development is part

of the city strategy, led by the Mayor, Adv. Adel Badir, to offer new opportunities for the young local citizens, including women, with technological background.

Discussion & Conclusions

The current research presents a study on high-tech entrepreneurship in the Israeli-Arab community from different perspectives in order to get a comprehensive understanding of its characteristics and to identify its weak and strong points for further development.

The survey findings reveal that Israeli-Arabs aspire to be self-employed or to be employed in global organizations. The interviews support these results by explaining that the preference to work in a global high-tech organization is due to required knowledge and experience that an entrepreneur needs before he or she starts a new business. Thus, young engineers tend to look for a job in global companies at the initial steps of their professional development, but tend to choose the self-employed direction at later stages.

Considering the motivation factors and barriers to entrepreneurship, three main categories should be examined: education, financing, and institutional and governmental support.

Education

The relationship between education and employability that is well-known with regard to general education (Lees, 2002; Knight & Yorke, 2003; Finch et al., 2013), requires two additional aspects in the field of high-tech entrepreneurship: education of technology and engineering, and education of business and entrepreneurship.

Although the number of Arab technology and engineering students has increased in recent years, there is still a gap to bridge in order to achieve the same level of education among Jewish and Arab students.

In the context of education of business and entrepreneurship, the survey respondents identified "lack of knowledge of the business world and the market" as one of the main barriers to entrepreneurship. It was further reinforced by the professional interviewees, who referred to the cultural differences between Jewish and Arabs and suggested to provide additional entrepreneurship education to Arabs in order to prepare them to the labor market.

Previous studies on entrepreneurship education found that students are more interested in entrepreneurial careers and have stronger entrepreneurial self-efficacy (e.g., Giacomini et al., 2011; Remeikiene et al., 2013). Sriram et al., (2007) suggest that "to ensure entrepreneurial

success, the requisite skill sets for a specific business must be identified and developed through education and training if they are learned skills, or nurtured if they are inborn talents"(p.254).

Although the extent of that impact on the level and effectiveness of entrepreneurship is not decisive, it is clear that entrepreneurship education enhances propensity and intentionality (Pittaway & Cope, 2007). Thus, as Lee et al. (2005) explained, following a comparison of entrepreneurship education in US and Korea, this aspect of education is especially important in nations where the entrepreneurial culture is underdeveloped, compared to countries where the entrepreneurial culture is well established. In this respect, the Arab community in Israel has similar characteristics to those of underdeveloped cultures.

We recommend to expand the availability and accessibility of entrepreneurship education to Arab students in Israel. There are few Israeli non-profit organizations, such as [Tsofen](#), [Kav Mashve](#), and [Sikkuy](#) that promote equal employment opportunities for Arab university graduates within the Israeli business sector and integration of Israeli Arab Citizens into the hi-tech industry. Those organizations deal, among other things, with training and education. However, a governmental initiative is needed to ensure more solid and sustainable infrastructure to support young engineers in their career path in the high-tech industry.

Financing

Based on the survey, we found that the main motivation factors for entrepreneurship are development of creative ideas and improvement of the socio-economic status, while financial-related factors and lack of institutional and governmental support are perceived as impediments to entrepreneurial activities. Lack of financial support was also identified in the interviews as the major barrier to starting a new startup. These findings are in line with previous studies, such as Smallbone et al., (2003) who analyzed African/Caribbean owned businesses access to finance and found that minorities have been less successful in accessing bank loans than others in UK, or Blanchard et al., (2008) who studied black- and Hispanic-owned businesses loan approvals and found that in the past there was a statistical discrimination, driven by lenders' stereotypes about the ability of black- and Hispanic-owned businesses to succeed under some circumstances and that black-owned businesses face discrimination in interest rates when they borrow from finance companies and businesses in US.

Entrepreneurship financing can derive from various sources, including bank loans, and angels and venture capital (VC) investments. Although no statistics was provided in the current study regarding access to financial resources, the perceived state of affairs, both by the respondents to the survey and by the interviewees, is a discriminating financial environment. Israeli Arab entrepreneurs tend to look for personal and private investments, rather than asking for bank loans because they believe that they will not be approved. In addition, the channels of angels and VCs are also very limited since those are related to networking opportunities, which are very few for Arab entrepreneurs. It is interesting to see that the survey respondents did not mention lack of networking as a major barrier to entrepreneurship, while the interviewees repeatedly raised this issue as the major obstacle to start a new business. The difference can be explained by the experience the interviewees have, where they realized that without proper networking it is almost impossible to get financial support.

In 2008, a unique VC fund sponsored by the state, Al Bawader, was ceremoniously launched as the first investment fund focused on the Arab private sector in Israel. Its mission was to expand both traditional and new Arab industry to create jobs and narrow economic gaps between Arabs and other Israelis. Unfortunately, not many success stories were derived from this project. We recommend to provide financial support of regulatory agencies for Israeli Arab entrepreneurs by affirmative action and to provide governmental support to semi-private Arab VCs that will focus on pharmaceutical and bio-technology, which are perceived as preferred fields of investment for Arab investors.

Strategic Institutional and governmental support

The relationship between entrepreneurship and economic growth seems to be clear and simple, since "Entrepreneurs create new businesses, and new businesses in turn create jobs, intensify competition, and may even increase productivity through technological change" as Acs (2006) explains in a paper on findings from the Global Entrepreneurship Monitor (GEM) project. Thus, it is a national interest to encourage entrepreneurship among the Arab community, and especially high-tech entrepreneurship which has a significant role in the economic growth of Israel.

The current study identified perceived lack of institutional and governmental support as a critical barrier to entrepreneurship, as reported by respondents to the survey. Similar conclusion emerged

from the interviews, where responses on lack of networking opportunities, which is the result of several reasons, were translated to the need for formal infrastructure to support entrepreneurial initiatives. The case analysis of Nazareth demonstrates a successful implementation of such an infrastructure, which can be used as a model for duplication in other Arab cities in Israel.

National policy is of great importance in the process of encouraging minority entrepreneurship. Several actions can and should be taken by policy makers with the attempt to advance Israeli-Arab entrepreneurship, including diversity within mainstream provision, an engagement strategy, improved access to finance, promotion of sectoral diversity, and better evaluation, as concluded by Ram and Smallbone (2003) in their study on encouraging entrepreneurship in the UK.

Israel Innovation Authority in the Ministry of Economy and Industry aspires to "nurture and develop Israeli innovation resources, while creating and strengthening the infrastructure and framework needed to support the entire knowledge industry" (www.matimop.org.il/). Its 2016 annual report includes a chapter on Arabs in high-tech that describes the governmental and non-governmental initiatives to encourage integration of Arabs in the Israeli high-tech industry. The governmental programs include: (1) a special track for minority entrepreneurs, aimed to help financing up to 85% for startups, comparing to 50% financing in the regular track; (2) NGT3 (Next Generation Technology), a technological incubator in Nazareth, which is structured as a venture capital fund, focused on medical device and life science technologies and holder of a government franchise to operate a technology incubator for a period of 8 years; (3) Imthias project, aimed to assist young Israeli-Arabs in engineering and computer sciences higher education studies; (4) outsourcing projects for integrating academics from the Arab sector working in a high-tech industry; and (5) the Investment Center of the Ministry of Economics and Industry is working to create quality jobs in national priority areas.

Based on the above, it seems that there is an institutional and governmental infrastructure to support Israeli-Arab entrepreneurs. However, since those programs are relatively new we cannot assess their exact impact at this stage. Due to the major differences between the Arab community and the Jewish community in Israel with regard to high-tech entrepreneurship, we recommend to expand those programs and to initiate additional programs that will target the whole Arab community as a whole and specially to encourage the next generation, at the age of primary and secondary schools to be familiar with the high-tech industry and entrepreneurship.

Research limitations and Future Research

Although the current study yielded interesting and valuable insights on Israeli-Arabs entrepreneurship, it suffers, like any other study, from several limitations. First, we used three different research methodologies and integrated the results into coherent conclusions, but the research sample in all three methods was limited to people that Tsafen has access to. Even though this sample represents a wide population of stakeholders involved in the high-tech entrepreneurship community in Israel, it might not represent all the population and circumstances. Second, the limited sample restricted our ability to investigate the hypotheses with regard to different sub-categories such as Arab women entrepreneurs, Arab entrepreneurship in different areas in Israel (the Galilee, the Southern Triangle, the Northern Triangle, the Negev, and East Jerusalem). Third, due to the three research methods we selected for this study, we describe and analyze the current state of affairs concerning Arab entrepreneurs and entrepreneurship in Israel today. Those tools did not enable us to produce a longitudinal study that includes repeated analyses of the relevant factors over long periods of time, thus to analyzing the dynamic aspect of high-tech entrepreneurship and make conclusions regarding its development trends.

Future research can build on the current study on several levels. A comparative research of Israeli-Arab entrepreneurship vs. Israeli-Jewish entrepreneurship may highlight specific differences that can be used to create guidelines for equality. Another comparative study on the characteristics of entrepreneurship among the Arab minority in Israel vs. characteristics of entrepreneurship among the other minorities in different areas of the world, might identify global and local points for improvement.

In addition, in-depth studies are needed. For example, many studies have recently been made on entrepreneurship and gender, but combining gender and minority, i.e., Israeli-Arab women entrepreneurs, will probably yield interesting results that will have implications on promoting this under-represented population. From another point of view, the current study results, that identified education, financing, and strategic-institutional support as the major factors influencing entrepreneurship among Israeli-Arabs, call for a thorough examination of each one of those factors which will assess the actions needed to be taken and the socio-economic benefits on a strategic level.

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