

# Networking for Venture Creation and Development: Exploring the Activities of Female Technology Entrepreneurs in Jordan

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**Key words:** Network; female entrepreneurs, new technology firms, Jordan.

## ABSTRACT

**Objectives:** This research explores the networking activities of female entrepreneurs in Jordan as they create and develop technology ventures in Jordan. It seeks an understanding of the characteristics, content and dynamic nature of network ties of female technology entrepreneurs in Jordan.

**Prior work:** Creating and growing a venture requires an abundance of diverse resources, many of which are accessed through network connections. Previous research suggests that, to succeed in traditionally male-dominated technology sectors, female entrepreneurs need to be well-integrated into networks with diverse network ties: it also raises questions concerning the nature and dynamic processes surrounding female entrepreneurs' network development. Most work has been undertaken in western contexts, leaving a marked absence of studies in other contexts, such as the Middle East where women are a growing force but the socio-cultural and business environment is different.

**Methods:** The study adopts a qualitative approach which, through semi-structured in-depth interviews, explores the dynamic nature of the female entrepreneur's network in technology-based ventures in Jordan. A total of 14 female technology entrepreneurs participated in this study, which utilised a two-stage, semi-structured interview approach. The women were chosen for interview on the basis of several conditions that have theoretical and empirical importance for this study.

**Result:** The paper reports on the types of formal ties (e.g. professional ties with other entrepreneurs, CEOs, mentors, support organisations, professionals, companies and business partners) through which the entrepreneurs obtained knowledge, social and financial capital to start and grow their businesses. It also explores informal network ties (e.g. family, friends and previous work ties) which provided these capitals as well as emotional support. Unlike studies of western entrepreneurs which show a tendency to rely on female-dominated networks at start-up, Jordanian women's network ties appear to be largely male-dominated from the start.

**Implications:** This research is generating insights into the experience of the female technology entrepreneur in Middle Eastern societies where the socio-economic context in which women build their careers and ventures is different from western environments. Its findings have implications for understanding the female entrepreneur's network from which she draws resources and its role in venture formation and growth.

**Value:** The research has practical value for policymakers who work to support female entrepreneurship in technology-based ventures, where an understanding of how the network of the female technology entrepreneur is developed is necessary to aid design of appropriate strategies/mechanisms for supporting the female entrepreneur as she develops her venture.

## **Introduction**

Female entrepreneurs face many challenges in their efforts to ensure the successful emergence and growth of their businesses (Hampton et al., 2009), particularly in businesses characterised by a high level of uncertainty and interdependency such as new technology businesses (Moensted, 2007). The main challenge that entrepreneurs face is securing access to the necessary resources, given that the accessibility of those resources can mean the difference between survival and failure of the business (Hite and Hesterly, 2001). An entrepreneur's network ties have been widely acknowledged as a vital vehicle through which necessary key resources for his or her entrepreneurial activity can be acquired (Larson and Starr, 1993). These network relationships are dynamic in nature, and they are likely to change through time to meet changes in the firm's resources requirements (Grave and Salaff, 2003; Hite and Hesterly, 2001).

Research has examined the female entrepreneur's network, but work on the dynamic processes associated with their network ties is very limited and Western centric (Hampton et al., 2009, 2011; Klyver and Terjesen, 2007), with an absence of such research from Eastern societies. In addition, the limited research has overlooked a central issue: the changing content of the female entrepreneur's network in order to help explain the role of the network in accessing the necessary resources for firm creation and survival. The effectiveness of the entrepreneurial process is affected by the content which the entrepreneurs' network ties might bring, with these ties gaining new characteristics as a firm grows (Lechner and Dowling, 2003).

Research indicates that entrepreneurial networks ties evolve through time, with entrepreneurs managing their network relations through a process of exploring, screening and selecting dyad ties (Larson and Starr, 1993). This process reflects a continual cycle of building new ties, maintaining existing ones and ending some old ties, in order to adapt to change in the venture's resource requirements (Rivera et al., 2010).

To address the knowledge gaps identified above this research investigates the network ties of Jordanian female entrepreneurs and how they develop through time to provide advantages during the new technology firm formation and development process.

## **Female entrepreneurial process**

Female entrepreneurs' firms in Jordan do not have sufficient internal resources to guarantee successful formation and growth. Usually, these ventures face many difficulties including accessing financial resources as well as other challenges associated with marketing, hiring and retaining good employees (Kharouf et al., 2007). As a result, these ventures have either limited growth ability or a high probability of failure. A critical issue, therefore, is to ensure the success and survival of these ventures and to find secure access to resources in the external environment (Steier and Greenwood, 2000; McEvily and Zaheer, 1999).

The entrepreneurial process of female business founders is influenced by many issues related to their human capital, primarily their lack of work experience, as well as financial capital, with the limited availability of external financial resources to fuel their businesses growth a key issue (Menzies et al., 2004; Coleman, 2002). Along with these types of entrepreneurial capitals, an entrepreneur's social capital represents a crucial resource for building more successful entrepreneurial ventures (Nahapiet and Ghoshal, 1998). It provides a basis for the development of the other capitals, both human (Coleman, 1988) and financial (Brush et al., 2002). Through network ties, entrepreneurs secure unique conduits to formal and informal investors (Steier and Greenwood, 2000, 1999) and create new human capital (knowledge) (Nahapiet and Ghoshal, 1998).

The entrepreneurial process is a result of the entrepreneur's efforts to access the necessary resources which are required to exploit a viable opportunity (McGowan et al., 2008). The important issue in this equation is that entrepreneurship needs a network for linking entrepreneurs to the resource providers (Aldrich, 1989). As such, success in the female entrepreneurial networking process results from the ability of the network to facilitate access to connections which range from those enabling them to acquire the necessary knowledge and strategies relevant to their entrepreneurial entry, opening new contact channels (Leskinen, 2011; Ahmad and Naimat, 2011), providing mechanisms to share information, obtaining business idea validity, to securing resources and support (Hampton et al., 2009). In terms of usefulness, cost and rate of use, networks represent

the main source of information that female entrepreneurs rely upon in their business, from the earliest stage of a business (Nelson, 1987).

Female entrepreneurs who establish their business in the technology sector will find themselves in an environment which requires intensive resources and is male-dominated (McGowan et al., 2008). To achieve the successful start-up and growth of a new entrepreneurial venture in such an environment, female entrepreneurs have to demonstrate their ability to build a network of high quality relationships (Hampton et al., 2011). Network ties are particularly important for technology entrepreneurs, given that they continually enable those entrepreneurs to access new opportunities in a highly uncertain environment (Moensted, 2007). Therefore, the greater the development of these networks through the firm formation process, the more benefits can be gained in terms of the quality of opportunities, resources and information (Gulati et al., 2002).

The limited studies reported in the literature focused on the female entrepreneurial network, particularly on technology-based firms, indicate that those women have proven their ability to develop highly sophisticated entrepreneurial contacts (Hampton et al., 2011, 2009). Within the entrepreneurial network literature, the basic argument is that the entrepreneurial network changes continually (Larson and Starr, 1993). This reflects an image that in searching for new resources to gain more venture growth, new entrepreneurial ties will be added as a result of which the quality of the network structure and its content will change (Gulati et al., 2002; Hite and Hesterly, 2001).

A network is built upon blocks of ties (Jack et al., 2004), where understanding the nature of these ties represents the first step in analysing the entrepreneur's network (Hite, 2005). However, few studies within the female entrepreneurship literature have attempted to explore the development and content of the network ties of the female entrepreneurs (Hampton et al., 2009). Thus far, and despite the importance of the network ties in understanding the female entrepreneurial process, the nature and content of these ties has not been fully explored. This paper, therefore, focuses on research which is seeking to provide greater insights into these aspects through an analysis of nature and content of network ties of female technology entrepreneurs in Jordan, as a case study of an Eastern society.

### **Entrepreneurship in Jordan's technology sector**

Jordan is among the most open economies in the Middle East and North Africa (MENA) region, having implemented since the early 1990s numerous reforms to restructure the country's economic activities, such as, encouraging privatisation, reducing trade tariff barriers and signing up to a number of trade agreements (Majcher-Teleon and Slimene, 2009). It has a good environment for businesses growth and is classified as a 'moderately free' economy in the 2011 Index of Economic Freedom (Miller and Holmes, 2011). Based on many indicators, the Global Competitive Report 2013-2014 has categorised Jordan's economy as an 'efficiency driven' economy, with significant opportunity for improvement, due to its current rank in ICT use (Schwab and Sala-I-Martin, 2012).

In the last decade, notable improvements have been seen in Jordan's technology sector, where reforms have been undertaken to improve the physical and intellectual infrastructure of the sector (Majcher-Teleon and Slimene, 2009). Thus, opportunities are emerging, especially, in the ICT sector, as a result of factors including liberalised telecommunications, increased infrastructure accessibility, increased government support and the creation of an enhanced ICT regulatory framework (Al Jidara, 2006). These efforts have enabled the country in recent decades to become the regional leader in adapting, developing and utilising information and communication technology (Jordan National ICT strategy 2013-2017).

Despite developments which have opened its economy and created a favourable business environment (Miller and Holmes, 2011), the available official figures show that Jordan suffers from high unemployment rates, ranging from 10.8 per cent among men to 20 per cent among women (Jordanian Department of Statistic, 2012). Thus, job creation for a youthful population is one of the Jordan's first priorities, with the government National Agenda 2006-2015 aiming to reduce unemployment rates and increase women's labour force participation by 2015. For a country with its level of development, Jordan's private sector participation in economic activities is relatively low. This is an indicator either of 'a more favourable environment for the formalisation of enterprise or a low level of subsistence economic activities' (Miller and Holmes, 2011: 19). This forces policymakers to seek better strategies for creating value added jobs and encourage the private sector to participate in absorbing additional members of the labour force (Miller and Holmes, 2011).

A broad agreement exists about the key contribution that entrepreneurial activities can make to economic development and job creation (Robb and Coleman, 2010). Increasing the prevalence of entrepreneurial activities is one of Jordan's significant opportunities, where an investment in developing a more entrepreneurship culture among young people and facilitating would-be entrepreneurs' entry and growth could bring significant benefits to the country.

An analysis of the country's engagement in entrepreneurial activities, particularly in the technology sector, reflects some recent improvements. In doing business, the country has introduced regulatory reforms to make business registration for entrepreneurs easier and less costly (World Bank, 2012, 2013). The World Bank Doing Business Report shows that the process aspects that are required for starting an entrepreneurial business have changed and improved, with the greatest improvements being seen in the minimum capital requirement and cost to complete the start-up procedures. Other important reforms were undertaken in 2005 by making key information available to entrepreneurs online (World Bank, 2005), as well as in 2010 making a single reception service for business registration (World Bank, 2012, 2013).

The country's technology sector saw progress between 2000 and 2012, particularly in ICT, as its contribution to Jordan's GDP reached 14% (Intaj, 2013). According to Intaj's report (2013), this sector is responsible for a significant share of technology start-ups, with over 50% of Jordan's start-ups in sectors such as IT, mobile and online businesses, electronic publishing and telecom. In addition, around \$15,000 million of foreign direct investment was attracted by the ICT sector in 2010 (Intaj, 2013).

In terms of entrepreneurs' individual development, the sector has witnessed recently involvement from a number of government and non-government bodies<sup>1</sup> focused on developing technology entrepreneurship in the country. These bodies have helped to enable technology start-ups in different areas related to training, consultancy and mentorship, and through the support of informal education sources such as seminars and networking events. These developments make the country a positive environment in which to launch a technology start-up<sup>2</sup>. According to the World Economic Forum Report (2011), Jordan is recognised as a 'haven' for entrepreneurs in the MENA region due to the developments in its entrepreneurial ecosystem. However, Jordan's engagement in entrepreneurial activities is new, and many aspects of the technology entrepreneurial ecosystem are still underdeveloped and face challenges, including formal education, the availability of equity investment and bank finance and women's participation.

**Entrepreneurship education in Jordan:** Jordan has a significant opportunity to take advantage of its highly educated, youthful population; a high percentage of students graduate from the science, engineering and technology schools. It is clear those young people, if successfully provided by the curriculum with knowledge and practical skills and tools in entrepreneurship fields, will greatly support development of the entrepreneurship culture within the country (Masri et al., 2010). Studies show that less than 4% of the young population receive a formal education in how to start a business (Miller and Holmes, 2011). Entrepreneurship education in the Arab States Report finds that the policy framework for entrepreneurship education in Jordan is well developed, but more needs to be done at the level of policy implementation (Masri et al., 2010). This represents a wake-up call for the country as the entrepreneurial spirit is motivated by the education system and should be developed at an early age (World Economic Forum, 2011).

**Financial capital availability and accessibility in Jordan:** On the other hand, financial capital availability and accessibility are frequently cited as the main challenges that would-be entrepreneurs face in Jordan and in other Middle East countries, and are perceived as primary barriers to entrepreneurial venture start-up and growth (World Bank, 2012; Chamlou, 2008; Kharouf et al., 2007; World Bank, 2005).

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<sup>1</sup> Such as the Business Development Center (BDC), Ipark, Endeavor, Oasis500, N2V, Queen Rania Center for Entrepreneurship, Mowgli, Meydan, AlUrdonia Lil Eba, Young Entrepreneurs Association, Jordan Enterprise, IV Holding.

<sup>2</sup> Considering criteria such as the legal environment, availability of infrastructure and entrepreneurial spirit and talent, Jordan's capital Amman has ranked recently as one of the top world cities to launch a tech start-up. This rank was developed by the founder of venture capitalist firms, Richard Sefrioui and his team (<http://rachid-sefrioui-venture-capital.blogspot.co.uk/2012/01/top-10-cities-to-launch-tech-startup.html>).

The reality is that Jordan's entrepreneurial enterprises experience many financial difficulties including: first, the limited availability of private finance for starting new ventures, which is constraining some sectors, especially the technology sector (World Bank, 2012). Second, dependence on personal savings to secure finance for start-up or growth sometime is difficult as a result of the low per capita income in Jordan (World Bank, 2012; Women's Business Forum, 2011). Third, the credit environment affects the availability of funds for entrepreneurs in the MENA region, which is ranked among the lowest developed capital markets of all regions (Women's Business Forum, 2011). In Jordan, the World Bank's report (2012) suggests that despite the improvement in the accessibility of credit, there are still challenges regarding the difficulty and scope of accessing credit information in both public and private sectors as well as in protecting investors and enforcing contracts. Fourth, external finance that is provided mainly by banks is still limited and insufficient to cover the local demand. Also, the availability of external finance is affected heavily by the financial institutions' programmes (Women's Business Forum, 2011) in terms of the amount of funds available and the procedures and the guarantees required to obtain the funds. Fifth, the availability of business angels in the Arab World in general is still limited and in an early development stage; in Jordan, for example, there are 23 angels, 17 of them are business men, three are business women and the other three are companies (Siam and Rifai, 2012). Those angels are providing finance to the value of about a million dollars to several projects which are in the emergent stage (Siam and Rifai, 2012).

***Female technology entrepreneurs in Jordan:*** Another obvious feature of the Jordanian technology sector is the low participation rate of female entrepreneurs: generally 5.3% of businesses are owned by women, compared to the 94.7% owned by men (MPIC and UNDP, 2011). The fact is that the rate of women's economic participation in the country does not match the level of the world standard, which is between 25%-33% or even the women's economic participation rate in some other Middle Eastern countries, such as in Egypt where this rate reaches 18% (MH and ODT, 2007). The low female participation rate in Jordan's economic activities represents significant wastage of human and national resources; particularly those women who are well educated (Peebles et al., 2007). Thus, one of Jordan's important challenges is empowering women, especially in the area of economic life (World Bank, 2005).

In addition to the above mentioned obstacles in Jordan's entrepreneurial ecosystem we find that would-be female entrepreneurs suffer to a great extent from the limited availability of financial resources. The reason behind this is that most studies show that female entrepreneurs depend on formal financial resources such as banks, personal and micro-finance loans for finance their businesses, and in a higher percentage rate than men (Chamlou, 2008). A World Bank report found that 14% of female entrepreneurial firms' new investments in Jordan are financed by commercial banks or through other formal resources such as leasing arrangement, investment funds, or credit cards, compared with just 4% for male-owned businesses (Chamlou, 2008).

On the other hand, Jordanian women lack experience in technology sectors, as a result of their low participation in the workforce, particularly in managerial positions (AlJidara, 2006). This affects women's ability to build their human capital and acts to exclude them from relationships which connect them with the industry resource providers who may help them to start their businesses (Mayer, 2006). Women's presence in managerial positions in technology sectors is under-represented across countries, due to the uni-dimensional role that tends to be common in such a managerial career, rather than a dual role frequently held by women (Evetts, 1993).

Family commitments are a perennial issue when examining the obstacles that the female entrepreneur faces. With regard to family/work-life balance and despite the improvement in this aspect, Kharouf et al.'s (2007) study found that this balance still represents a social challenge for Jordanian female entrepreneurs. Indeed, female entrepreneurs around the world are still responsible for many family commitments and make a greater contribution to the family-work balance than men (Hampton et al., 2009; Evetts, 1993; Aldrich, 1989). The degree to which this challenge affects the entrepreneurial process for women varies from one region to others, and working for long hours as the new venture requires countless hours and traveling in order to grow the business is difficult for a married woman in Jordan.

Having business and family commitments requires extra effort from the female entrepreneur to succeed in her business and influences her performance as she may be required to spend time on family commitments which interrupt her work. For example, according to these roles, women in the Arab World do not have much opportunity to spend much time in building networks (Dajani, 2012)

which would help them to develop their businesses. Thus, women requires more recognition and support in their family role particularly in Arab societies (Dajani, 2012), where they are principally entrusted with this role.

Despite these challenges, there have been changes and more new technology firms are expected to be developed by female entrepreneurs resulting in their increased participation in the sector. One of the important developments that might help increase women's economic participation is the new law which allows having a business license to work from home. Also, Jordan's recent human development report shows that female entrepreneurs have become more recognised and respected inside their families as reliable and productive members (MPAC and UNDP, 2011). This report found that 83 per cent of female entrepreneurs in Jordan see that their life has improved through owning their business, as a result of different factors including 'increased income, control over one's life, a better position within the family and an improved family-life balance' (MPAC and UNDP 2011: 116).

Figures from a number of technology business associations and accelerators provide an indication that female entrepreneurs' participation in the technology sector has started to increase (Oasis500, 2012), helped by the fact that Jordan has a good talent pool of educated science and technology women. For example, figures from Jordan's Oasis500, the first technology start-up accelerator and seed investment company of its type in the region based in Jordan, indicate that 35% of their companies in 2012 were founded/co-founded by women. Oasis500 also expects that this number will increase in the next few years.

In summary, women entrepreneurship is a result of economic, institutional and social structures in which the individual is embedded (Yetim, 2008). Thus, the extent of society's cultural and financial support can provide an indicator to the level and nature of entrepreneurship in the society (Xavier et al., 2012). This review has provided a background to the Jordanian entrepreneurial environment, in order to show strengths, such as education, and weakness points, such as availability of financial resources and low female entrepreneurial participation levels in Jordan's technology entrepreneurship ecosystem.

## **Methodology**

Entrepreneurship research needs research approaches which allow for discovery, exploration and theory building (Hampton et al., 2011). Literature argues that studies which adopt a qualitative approach are better placed to provide a richer understanding of entrepreneurial networks (Jack, 2010). Qualitative work has been recognised to be a more appropriate approach for studies exploring the development process of the entrepreneur's network (Hoang and Antoncic, 2003; Lechner and Dowling, 2003). Therefore, the study reported here adopts a qualitative approach, which through semi-structure, in-depth interviews, explores the dynamic nature of the female entrepreneur's network in technology-based ventures in Jordan.

Up-to-date listings of women-owned businesses are difficult to obtain in Jordan, where there are no accurate databases to help find those women. Thus, this study relied on personal contacts comprising those with different bodies dedicated to encouraging entrepreneurship in Jordan as the primary sample source. A total of 14 female technology entrepreneurs participated in this study, which utilised a two-stage, semi-structured interview approach.

The women were chosen for interview on the basis of several conditions that have theoretical and empirical importance for this study. All the female entrepreneurs owned, created and managed technology-based firms and they had hired their first employee and sold their first commercial product/service (Table1 provides further details of the research participants). A two-stage, in-depth interview process was employed, with explanations sought during the first research interview about the evolution of the female entrepreneur's network ties and her overall network structure. The second stage research interview was mainly to elicit and clarify more about the network ties of the female entrepreneurs and the kind of content that these ties provided, as well as explore further the women's experience of entrepreneurship in the Jordanian context. This interview stage allowed review and confirmation of the network ties of the female entrepreneurs. The two interviews took place within three weeks of each other.

The female-owned technology ventures in this research range from the start-up to early growth stage: all had operated for less than seven years. These ventures represented different technology areas

including software, animation, digital content, mobile applications, web services, engineering activities and technical consultancy, technical testing and analysis, medical equipment and ICT consultancy. The participants' age when they started their business ranged between 23 and 49 years, and most of them had related prior experience. Issues investigated during the first and second stage interviews included the nature, content and evolution of the female technology entrepreneur's network ties.

Analysing and eliciting the essence of a huge amount of data represents the main issue in the qualitative data analysis (Patton, 2002). This requires a process of dividing the data into subgroups according to a logical system to facilitate the process of data analysis (Whittemore and Knafelz, 2005). Reducing the amount of research raw data involves a process of data 'selecting, simplifying, summarising and transforming' (Miles and Huberman, 1994:10). This process of data reduction helps to sharpen and manage the data in a way which facilitates conclusion drawing and verification. When the data were collected the research interviews were taped, transcribed and then analysed to determine the categories and themes. The collected data have been analysed by using open coding, which has been facilitated through use of the Nvivo data analysis tool. Thus, initial themes from the data were generated to understand the networking activities of the Jordanian female technology entrepreneurs. These themes were then clustered into nodes which helped connections to emerge pointing to core insights around key themes of network structure, content and process.

Table 1: The characteristics of technology firms and their founders participating in the research

<b>Firm</b>	<b>Age of firm</b>	<b>Technology sector</b>	<b>Age of founder at start-up</b>	<b>Prior work experience in the same field</b>
F1	7	Electronic publishing	29	Yes
F2	7	Digital content	39	No
F3	6	ICT consultancy	44	Yes
F4	6	Web/internet services	30	Yes
F5	4	Software	30	Yes
F6	4	Medical equipment	23	No
F7	2	Digital content	30	Yes
F8	2	Digital content	30	Yes
F9	2	Digital content	32	Yes
F10	2	Digital content	30	No
F11	2	Digital content	49	No
F12	2	Digital content	37	No
F13	2	Engineering technical consultancy	35	Yes
F14	1	Animation	23	Yes

## Findings and discussion

In this section we present a discussion of the research findings focused around two main themes: the network ties of the Jordanian female entrepreneurs in technology firms through which the businesses' resources were reached and obtained during the business development process, the composition of the networks of those female entrepreneurs. The findings here are presented at the level of the founder and her ties to others (persons or firms) (Witt, 2004).

### **Network ties of the Jordanian female entrepreneurs in technology firms**

The analysis of the network ties of Jordanian female entrepreneurs in technology firms demonstrated that they relied on different types of network ties through which they obtained knowledge, social and financial capitals to start and grow their businesses. These network ties comprised 1) Personal ties which include family, friends and previous work ties; 2) Business ties which include people in the same field, other entrepreneurs, CEOs and managers, mentors, support organisations, professionals and business partners; 3) Clients, agencies, suppliers and distributors.

Each network of ties provided a different type of content to the female entrepreneurs and played a key role in different business life-cycle stages. Results indicated that the business connections of those female entrepreneurs played an important role from the start-up stage. A significant finding concerned the business ties as a main source to reach and obtain the required resources. Indeed, when the female entrepreneurs searched for the necessary resources to start and grow their businesses, they identified business ties as a more suitable source to obtain the resources they lacked.

**Personal ties** were based on personal bond relationships, and were characterised by their limited extent in that they provided limited resources and, thus, had less effect on the business. An important similarity among the female entrepreneurs was the limited role for their business of family, friends and previous work ties, which originated from direct contacts.

Family members were mainly a source of emotional support. A comment from F10 reflected this: 'they give more normal support but not in-depth for the business. Like my husband and my father they're a really big support, but they don't actually add value to the business itself'. F9 explained: 'they give moral support, I mean, more emotional support, not financial or technical support, its more emotional support'. Some female entrepreneurs pointed to the 'extra pairs of hands' as the main role/contribution of their family members. For example, F1 commented: 'she [her sister] was helping to do the documentation for the competitions' and 'I used to make like user testing to let my sister, brothers and relatives use the device and ask for their suggestions'. Similarly, F3 stated: 'She [her mother] gives me time more than anything and even emotional support and she takes care of my daughter when I need to work for long hours'.

For the friends and previous work ties, most of the respondents indicated that these ties were primarily a source from which to learn about human resources. For example, F11 stated: 'my friend helped in that they told me about some employees ... and emotional support, no more ... actually their input in my business was not strong'. Within some cases friends' ties had less effect on the business. A comment from F6 reflected this: 'not for work, my relationship with them is very superficial ... I have many friends but nobody helped me in my business, we sometime have a chat, just chat'. However, in some cases, the friends who had businesses were a source for obtaining some advice. For example, F8 claimed that 'friends who have businesses, they helped me out with certain aspects, like questions about registering the company, about the capital, about how to setup and about branching [out]. I have friends in my network who have businesses, so, those helped, yes'.

The previous work ties of the female entrepreneurs, also, appeared to be less useful for their business. F2 reflected this view: 'our relationships were attached to work, so, when I started they were excited and they really encouraged us to start, but they didn't get me clients or connections or even give advice, but they really were encouraging us to start'. While most of the female entrepreneurs indicated the limited value of previous work ties, some linked this to irrelevance of these ties to their current business. F9 commented on the nature of help received from her previous work ties: 'in my previous job ... we were involved in three main sectors. One of them ... I am still in contact with all the people that I have known earlier ... I still have some business contacts with this group, but the other two sectors that are unrelated now to my business ... these two sectors the contacts that I have there in two these sectors, are still there, of course, and I still meet them ... but I have a different level of conversation with them or different topics to discuss because they're not in the online business and they're not in the IT related industry ... so, no help in this business, no'.

However, two participants indicated that the previous work ties were important in providing help and building access to some resources. F7 explained that: 'I have a lot of connections with the international companies in the industry ... I attend so many different events in my life, nearly, you can say I travelled the world, I travelled to most of [X company] events for different business partners, when I started at the beginning I was a technical person. So, I used to attend a lot of technical discussions and technical details. When I came into management, the business partner event for [X Company], business partner events for [Y Company], because I was representing both companies in my previous job, plus attend other main suppliers and IT events in the industry ... this is how I developed my network ... I built on it, but the base was there'.

Thus, it is evident that family, friends and previous work ties were important to the respondents to obtain emotional support. These ties developed on the basis of knowing contacts personally and were with those to whom the female entrepreneur was closely connected. Such kinds of ties were used to obtain from family and friends 1) emotional support, 2) an extra pair of hands to lend support and from previous work ties 3) access to human resources.

In terms of the dynamic nature, the emotional support that those female entrepreneurs received from their personal ties was important at the start-up stage. For example, F2's comment indicated that 'at the beginning they supported me a lot by their excitement and you know the family. After that when I started, the community, the entrepreneurs' community supported me a lot'. F14 commented on her connection with the previous work ties that 'my connection with them after I started decreased a lot, because as you go further in your business, you reach a stage that these relationships will not benefit you'. Another comment came from F3: 'My friend not as much, but I think we grow up and we learn how to make new friendships. So again friends, hum, the friends I hang around with these days are other entrepreneurs and people in the same industry because we have more to talk about'.

Confirming this, some participants commented upon their growing experience and confidence was a basis for decreasing the role of family in their businesses. F6 stated: 'now less, because now we're more confident, now we have different knowledge and now we have other mentors who are in the field of IT and digital business, so, it's easier to ask them because they know trends more than asking our husbands and fathers who are more traditional businessmen'. Similarly, F9 commented: 'I think probably less these days, because they noted that, hum, I'm fine doing things on my own, it's not like a new struggling entrepreneur needing help and support. In the back of their mind, they know that I'm fine'.

However, some respondents indicated that the emotional support from their families increased as they proved their business idea after the start-up stage. For example, F3's comment reflected this: 'At the beginning they did not think it's a good idea, I had a good job and they thought that it's better for me if I stay in my job, secured job, secured salary, social security. So, at the beginning they want me to stay in my job. But after I took the step and I started, they have become supportive, very supportive' and she added 'After I started and after I launched my website and got investment, they believe in it more and they have become definitely more supportive'.

Other female entrepreneurs confirm this also: F8 explained: 'they've changed, they support me now more, it is different, because I proved it that it's a good thing and so on, but for them it was a new thing at first, for their daughter to start her own company, they were looking for a secured job, you know, and it's the same story with females and males and everyone in this part of the world'. Similarly, F1 stated: 'I think now my mum and dad, they trust me more. I mean, they trust my decisions more. So, they start to say like if this is your choice, we're gonna support you, like this'.

Entrepreneurial network literature suggests that the personal ties including the family, friends and previous work ties are important at the start-up stage for providing technical (Jack, 2005; Jack et al., 2004) and financial support, where the family investors are important in providing the hard financial resources at stages of the business (Larson and Starr, 1993). Interestingly, this study found that the family ties' role was not precisely the same role which is described in the literature. Instead, this role was limited to providing emotional support and some hands-on support. Moreover, in some cases and until their business ideas were proved in the market, receiving start-up business encouragement and accepting the idea of quitting a secure job can be difficult.

The situation in Jordan, socio-culturally has some characteristics which might have affected these findings. As described in the GEM-MENA's report, fewer Jordanians consider entrepreneurship as a

good career choice, and they are less likely to secure finance from their family members with fear of failure representing the main reason (Stevenson et al., 2010). A comment which helped to clarify this situation came from F11, who claimed 'the entrepreneurship concept itself was not very well known, so the support was not very strong and instead of encouraging us, they, either the family or the friends or the people that we know, they were scared of us taking this step'. Similarly, F8 indicated that 'my family comes from, erm, they have secured jobs, there are not many entrepreneurs in my family. My dad is not an entrepreneur, all of my relatives are employees, they have jobs, they have secured jobs. So, I did not get much emotional support, I got, usually what comes from my family like, are you sure, are you crazy and so on. It's common in this part of the world'.

Lack of knowledge that those female entrepreneurs needed among these types of ties pushed them, also, to seek help from other actors. Reflecting this F14 commented: 'my family, I mean, in term of business, they don't, no, because none of them has a business, so, when I come to ask them about a case, like, should I deal with this client in this way or not, or any other thing, they will not benefit me'. Another comment came from F3 on her friendship ties: 'my friends, they're employees most of them, so, I think .. there is a gap between us, it's difficult for them to understand what I go through every day at work'.

On the other hand, a woman as an entrepreneur still feels the effect of social stereotyping which sees her economic role as a traditional rather than professional one. This may suggest that female entrepreneurs in Jordan seeking resources and help prefer formal and direct entry through business ties. F6' comment reflected this: 'I typically don't like social introductions too much because I feel like, erm, I don't like to be introduced to someone within a social structure, because they were kind of, erm, although I know this is how businesses are formed, I feel like as a woman we're more, erm, we have a little bite more, erm, something we have more to prove, we need to appear even more professional than the average man to get the same amount of respect. So, I try very often, ... if somebody just says, Oh, I know so and so, I can introduce you, I prefer that we are introduced for example in a meeting or if he sends him a direct email and then I can follow up. Yes, I don't like to be introduced in a social event, because I feel like it's, I don't know'.

**Business ties:** our study highlighted that the type of network tie that had played the main role in the development of the Jordanian women's venture was the business connections. These ties included people in the same field: professional ties with other entrepreneurs, CEOs, mentors, support organisations, professionals and business partners. The origin of these ties varied from organisations to entrepreneurship events. The analysis indicated that most of these ties, also, were newly built when the female entrepreneurs made the decision to have their own venture.

These business ties were mostly based on business interaction and knowledge, characterised by high levels of business impact and convenience. For example, business impact was reflected by a comment from F10 on her tie with a seed investment company: 'through their mentorship and guidance I changed the idea'. Also it appeared in F3's description of her ties with CEOs and mentors: 'They sharpen the business view and they sharpen the personality and management skills, that's what they do. Because when they share their experiences and a lot of them have a great deal, for example [X and Y] they are behind the biggest technology exits in the region ... I'm privileged because they actually can share some of their experiences with me'. F2 described the effect of an entrepreneurship competition on her way of thinking: 'it all happened there, it was magic for me and I started my business directly after this event and people I met there supported and encouraged me and they got me clients, it was amazing'. In terms of the extent to which these ties are applicable to the female entrepreneurs' business needs, F5 described one of her professional ties: 'when I told them about [X company] idea ... they gave me immediate advice, they said forget it, like, don't mess with HR, because it is a wholly different field, it was very good advice for me'. F6 stated: 'we have a couple of mentors that we dealt with a lot like [X], I felt like he was very instrumental for us'. F2, also, commented 'he is the CEO of [X firm] and he is always ready to listen and welcoming'.

Knowledge trust and respect were important attributes of these business connections. For example, F9's described her tie with a CEO: 'his advice is always high value, because he's a very experienced and well-connected person'. F7 noted, 'if I want something really specific in the education area there are certain key people in [X Company] that I always consult before I go, because I know they have done this for a long time'.

This study indicated that most of these female entrepreneurs used these ties extensively to obtain resources, either knowledge, financial or social capital. F6's comment reflected this: 'a collection of people ... helped me basically to crystallise my idea along the way ... not all of them family ... they are mostly CEOs'. In obtaining financial support, business ties, particularly entrepreneurial support organisations were an important source, as F4 explained: '[X organisation] project ... they helped us in marketing partly our product ... by directly funding some of our marketing campaign'.

In building the social capital, this study found that business ties particularly with business organisations, seed fund investors and IT associations were the main entry path for new actors. F9's comment reflected this: 'the support that we've taken from [X Company], I wouldn't have had it if I set up my own company on my own. I mean, I will still have the, you know, the support from my family, definitely, but the contacts, the networks, the knowledge, the expertise, the potential that they are going to provide for me is a lot more than any other ... person would have been able to provide me with'. These bodies acted as a broker to other business ties such as another organisations, mentors, entrepreneurs, professionals and potential resource providers, which in some cases then connected those female entrepreneurs to new actors. For example, F3 stated '[X] organisation introduced me to [Y mentor] ... and he introduced me actually to two people in Saudi Arabia, which was a very difficult market to get in'. Thus, the principal content provided by business connections included: financial resources; advice; information; business development help and access to different potential actors within the market and industry; connections with support organisations, angel investors and national and international entrepreneurship competitions.

Results indicated that the business connections of the Jordanian female entrepreneurs in these technology firms played an important role since the start-up stage, during which their network ties were largely dominated by this kind of tie. Indeed, these ties seemed to fill gaps, provide diverse resources that the female entrepreneurs lacked from elsewhere and replaced the role of family, friends and previous work ties particularly at the start-up stage. F9 reflected: 'my previous contacts who I had met throughout ... my previous jobs and company, are not very related to the IT sector. So, I have not actually used a lot of my previous contacts in this new business ... my main motivation was the network and the credibility ... and the expertise that they [X seed fund company] have in the technology field that I wanted'. This study has found that, since they started, many respondents had sought help, particularly financial support and in terms of establishing legitimacy, from business organisations and through participating in national and international entrepreneurship competitions, which were vehicles which provided introductions to mentors, CEOs, angel investors, business owners and other entrepreneurs at the start-up and early growth stage.

**Clients, agencies, suppliers, distributors and competitors:** the final type of ties that Jordanian female technology entrepreneurs used were ties with clients, agencies, suppliers, competitors and distributors. These ties were characterised by a high degree of formality and lack of knowledge of each other, with the relationships associated with performing the work. In addition, most of these ties had been built either directly or indirectly through others (firms or individuals), where these network connections played an important role at the early growth stage of the female entrepreneurs' business. A comment by F8 reflected this: 'it has grown ... a lot, a lot, I have all my clients as they add new networks'.

The key role of these kind of network ties was access to customers, for example, F5 stated: 'the new customers were through my previous customers, it's like a sequence' and 'we have in Saudi Arabia, hum, there is a very big group called [X] group, it's an organisation that I didn't even dream that I can reach them, I have reached them through one of my customers, they called [Y], he is one of my main clients in Saudi Arabia'. Similarly, F3 commented: 'Dubai agencies are trying to bridge the gap between us and our market'. In many cases, these ties particularly with clients, transferred to become business friend ties over time. A comment by F2 reflected this: 'a friend of mine or a client, he became a friend later, he recommended me for the work and then I shifted the work to [X firm]'.

### **Network gender composition of the Jordanian female entrepreneurs in technology firms**

In an analysis of the network, this study showed that the network ties of the Jordanian female entrepreneurs in technology firms were largely male-dominated. A comment by F6 explained, 'most of those that we know are males' and F2 commented, 'I was talking to many entrepreneurs, ladies, but most of them were guys'. This clearly appeared by analysing the narrative of each case with similarity among all cases demonstrated in term of the gender, where most of the ties that those female

entrepreneurs have connection with were males. What was found within these cases was that the male-dominated network emerged in the very early stage and it appeared to be dominated by male connections also as the firms evolved into the early growth stage.

The male dominance in the network of those female entrepreneurs comes back to the influence of the nature of this sector, where it is well known that the technology sector is a male-dominated sector. In addition to that, Jordan's technology sector has a very low level of female participation in the workforce. F3's comment reflected this noting that the economy 'is dominated by males specifically this industry, other than that the workforce in Jordan or the female representation in the Jordanian workforce is only eleven percent ... is very low. So, already we have too few females working and we have even fewer females working in the ICT industry'. This view was reinforced, also, by F7's comment: 'I think most of the females they don't like, or, ok, you will find a lot of females who are programmers ... because they don't like to go out a lot, a lot of females, they will say, I will have to go and so on, I don't need this hassle, it's really a hassle, our work is a hassle, it is up to you if you want to take this challenge or not as a person'. This suggests that starting and growing a business in this sector, where most sources of knowledge are dominated by men, requires female entrepreneurs entering the sector to build and work within male-dominated business networks.

Indeed, diversifying their network in term of gender was difficult for those female entrepreneurs, where even finding another female entrepreneur could be an empowering experience. F6 explained 'it has been pleasant that there are some female entrepreneurs in [X organisation], which has been beautiful ... we became friends and we support each other'. Some female entrepreneurs who participated in this study indicated that their network was made up of male-dominated ties although they were looking for help from other businesswomen in their sector, but they could not find many. F12 commented 'most of them are males ... I see the same female entrepreneurs whenever I go, but how many are we? Few ... go and check the websites of all organisations which support entrepreneurs in Jordan, how many businesswomen acting as a mentor? There are few ... women's presence in this sector is just nothing'. In another comment, F14 indicated, 'I tried to find a female mentor, of course, there is no one, I have been in the market for four years, there is no female mentor, I mean, there is no businesswomen you can go and talk to, I can't find one'.

Entrepreneurial network literature suggests that the networks of many female entrepreneurs are all-female as they launch their business and that they tend to pursue a mix gender network approach at the development stage (Hampton et al., 2011, 2009; Klyver and Terjesen, 2007). An analysis of the female entrepreneur cases in Jordan's technology sector indicated that the male connection was dominated in their network ties during the process of starting and growing a business. The male-domination and low rate of female participation as a business owner and employee in Jordan's technology sector appeared to be at the root of building this type of network.

## **Conclusion**

Female entrepreneurial entry in technology sectors is still under-represented in all economies (Mayer, 2006), and it requires support from several bodies. The encouragement of women-owned ventures has become an important policy tool to overcome the high unemployment rates and achieve more economic growth, particularly, in those entrepreneurial ventures that add value to society's economic development, such as technology-based ventures. Opportunities are greatest where current levels of engagement by women are low such the case in Jordan, where the country has an underutilised source of entrepreneurial potential represented by its pool of educated women (Stevenson et al., 2010). Expanding our understanding of the female entrepreneurial process might help inform policy interventions as well as inform theory by identifying the nature of the entrepreneurial process in a different social and economic context. Achieving this understanding might help to enhance and design of appropriate strategies for encouraging women to engage in creating and developing their ventures.

This study focuses on understanding the nature and dynamics of the female entrepreneur's network and its role in the formation process of technology ventures in Middle Eastern societies where the socio-economic context within which women build their careers has a potentially significant impact on the networks from which they draw resources for venture creation and growth. The main objective of this study was to develop and expand our understanding to the network activities of the female technology entrepreneurs in Jordan by exploring the characteristics, dynamic and content of their network ties.

The study found that the personal ties, including family, friends and previous work ties, were important in providing emotional support, however, were less useful for the business, particularly in the start-up stage, in terms of providing financial or technical support. On the other hand, business connections of the female entrepreneurs have an important role in providing diverse resources, with their network ties dominated by these business connections since the start-up stage. However, entrepreneurial network literature recognises the family, friends and previous work ties as an important source at the start-up stage for accessing the hard financial (Larson and Starr, 1993) and technical resources (Jack et al., 2004). In this research, there was little use of family, friends and previous work ties at the start-up stage, therefore, business connections seemed to be filling the gap and replacing the role of these ties.

In defining the network gender composition of the Jordanian female technology entrepreneurs, the network ties of these research participants, as they sought to create and develop their businesses, is largely male-dominated. The literature indicates that women entrepreneurs are largely networking with other female entrepreneurs as they launch their businesses and they pursued a mix gender network at the development stage (Hampton et al., 2011; 2009; Klyver and Terjesen, 2007). One of the explanation of what happened in the Jordan case is that the Jordanian female technology entrepreneurs' have depended since start-up on their business connections such as mentors, other entrepreneurs and CEOs, and these ties are largely male-dominated as the women's presence in the workforce and economic activities is relatively low in Jordan, thus, this has an effect on the gender composition of their network ties.

The findings of this study reflect some valuable insights and address some of the literature gaps into the issue of network ties and the content of the participating female entrepreneurs' networks, particularly in non-western contexts. Implications of this study at a policy level suggests that more needs to be done to enhance the level of women entrepreneurial experience within technology sectors as well as encourage women in new venturing. For example, given the attitudes to the risk of failure that is related to the entrepreneurial activities among Jordanian youths and their families, adopting strategies at different levels will be needed to shift the entrepreneurial culture and modify the image of entrepreneurship as a career choice.

The male-dominated networks of Jordanian female technology entrepreneurs identified in this study may be limiting the potential to build more diverse networks and the ability to access diverse knowledge from the mixed gender network. Indeed, building networks with the same gender could have advantages in developing female entrepreneurial self-confidence (Hampton et al., 2011) as well as assist learning from other women's experiences, especially those who have established their businesses. Greater exposure to successful female entrepreneurs, particularly those who have high quality network relationships which support their business development, may assist would-be and early stage ventures as they establish and grow their businesses. As more women build successful ventures the easier it will be for those women to act as role models and mentors, helping shape a positive image of entrepreneurship as a career, particularly for women, in a society where female entrepreneurship is not the norm, let alone in the technology sphere. Ultimately, given this study is one of the first of its type outside western systems, additional research is needed to confirm or contrast with these study findings.

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