

University Support in the Development of Regional Entrepreneurial Activity: An Exploratory Study from Chile

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ABSTRACT: The theoretical literature has explored the potential benefits of the interaction between universities and entrepreneurs and there is some empirical evidence that supports the positive impact of entrepreneurship education in the subsequent propensity to become an entrepreneur. The purpose of this paper is study if higher education for entrepreneurship is reflected in entrepreneurship activities at the regional level. Replicating the methodology used by Coduras, Urban, Rojas and Martínez (2008) in Spain, we compare, in an exploratory way, the experience in Chile using data from the Global Entrepreneurship Monitor (GEM). The main results indicate that there is low interaction between entrepreneurs and universities and there is not enough impact to significantly affect entrepreneurial activity. Moreover, entrepreneurship education does not increase intentions to be an entrepreneur.

JEL Classification: I23; L26; O18.

Keywords: entrepreneurship; university-business interaction; promotion of entrepreneurship.

Apoyo de las Universidades en el desarrollo de la actividad emprendedora regional: un estudio exploratorio de Chile

RESUMEN: La literatura teórica ha estudiado los potenciales beneficios de la interacción entre universidades y emprendedores y existe cierta evidencia empírica que soporta la influencia positiva de la educación para el emprendimiento en la posterior propensión a emprender. El propósito de este artículo es estudiar si la educación específica para la creación de empresas brindada por las universidades se refleja en la actividad emprendedora a nivel regional. Replicando la metodología utilizada por Coduras, Urban, Rojas y Martínez (2008) en España, comparamos

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de forma exploratoria el caso en Chile usando la base de datos del Global Entrepreneurship Monitor (GEM). Los principales resultados indican que hay baja interacción entre emprendedores y universidades, y no hay impacto suficiente para afectar significativamente la actividad emprendedora. Así como contar con educación para el emprendimiento en la universidad no aumentaría la probabilidad de tener intenciones de emprender.

Clasificación JEL: I23; L26; O18.

Palabras clave: emprendimiento; interacción universidad-empresas; fomento del emprendimiento.

1. Introduction

Is education, specifically entrepreneurship education, a decisive factor for new business creation? The virtuous circle between economic development and education has been deeply studied in the academic literature (*e. g.*: Nelson and Phelps, 1966; Krueger and Lindahl, 2001) and a positive correlation has been observed between these two aspects (Barro, 1997). As educational level of the population increases, greater human capital may allow the development of commercial activities with greater efficiency. By consequence these mechanisms trigger an increase in productivity and, finally, results in economic growth. Regarding new business creation there is also relative agreement regarding the importance of entrepreneurship in sustainable economic development of countries (*e. g.*: Wenekers and Thurik, 1999; Van Stel, Carree and Thurik, 2005, Carland and Carland, 2004). Entrepreneurship increases the welfare of societies, mainly through three sources: 1) increasing the competence of markets; 2) generation of new jobs, and 3) by introducing new products and services. As a result, the incentives to pursue entrepreneurial activities are receiving more attention from policy and public-private programs (Audretsch, 2004).

Diverse theories indicate that entrepreneurial activities increase when high level of knowledge is present (Acs, 2010). In this sense, some studies mentioned that the economies (country or regional level) with high investment in new knowledge generation also have higher entrepreneurship levels (Audretsch and Lehmann, 2005). In a classical point of view, many of the new knowledge results from formal educational systems like universities. But entrepreneurship is a complex and dynamic system in addition to the economic, political and social phenomena. Given this interdisciplinary nature, it is not easy for an educational system to provide skills and competencies for the development of entrepreneurship. Nevertheless, around the world there are an increasing number of educational programs that seek more and better entrepreneurship education. Paradoxically, studies examining entrepreneurial activity, such as the Global Entrepreneurship Monitor (GEM), indicate that the relationship between education and entrepreneurship is one of the weakest drivers evaluated based on its actual impact on rates of entrepreneurial activity (Coduras *et al.*, 2010;

Kelley *et al.*, 2011). A weak relationship between education and entrepreneurship is seen even in the most developed countries such as those belonging to the OECD (Poblete and Amorós, 2011).

While the development of the knowledge and skills needed to initiate a new business may be fostered along different stages and educational levels, it is the university—as the highest formal educational institution—where they are delivered in greater depth. At the same time, many university entrepreneurship education programs try to combine personal skills with technical business training. Additionally, universities can provide complementary and academical support—whether technological or scientific aspects—through research centers or other mechanisms, which allow businesses to work more efficiently. The university is a suitable place to develop innovation, either individually or collectively from students and academics. This network generated between academics and students can demonstrate not only strong ties between the university and existing or current businesses, but also to the creation of new ones.

In this study we intended to measure, in an exploratory way, the relationship between entrepreneurship education at universities and the propensity to undertake entrepreneurial behavior. For this study, we used the Global Entrepreneurship Monitor database, GEM in Chile, which allows a quantitative measurement of the development of entrepreneurship activities. This work follows the empirical methodology used by Coduras *et al.* (2008) in a study in Spain using two approaches: the first examines the relationship between a proxy of quality of entrepreneurship education at universities and the level of early stage entrepreneurship activities in 12 Chilean regions. For this analysis we used a regional database during the period 2007-2012. The second analysis tries to assess the impact of having specific entrepreneurship education in higher education (university or college) and the propensity to be an entrepreneur. For this second analysis we use individual level data from a special topic «Entrepreneurship Training and Education» in 2008.

The rest of the paper is structured as follows: the next section reviews the literature regarding the importance of the link between universities and businesses, and how this impacts on entrepreneurial activity. The third section, presents the methodology. Subsequently different statistical models are developed and the results are presented. Finally, we conclude.

2. Conceptual framework

2.1. The link between universities and (new) business creation

It is known that the development of economies should be through the efficient optimization of all available resources. However, Hawken *et al.* (1999) emphasize that economic development just through the exploitation of natural resources is not sustainable, because it exhausts the stock of these assets and limits the potential growth of social capital. It is in this aspect, sustainable economic growth, where is-

sues such as social capital play a fundamental role. Research regarding social capital for the combination of knowledge, skills, competencies and networks in civil societies (Nelson, 1998), suggests that education is essential to maintain the sustainability of growth (Psacharopoulos and Patrinos, 2002).

Even though each educational level plays a fundamental role in society, it is at the university where there is greater connection with industrial sectors. A majority of the extant research in this area has theoretically explored the importance of the relationship between companies and universities (see *e. g.* Etzkowitz, 1998) and its regional impact (Fritsch and Schwirten, 1999) concluding that the transfer of knowledge from university to industries generates substantial economic growth (Varga and Parag, 2009). This may be explained because the university-industry partnership allows a flow of knowledge, where those who cooperate—whether large or small companies— extend and complement their absorption capacity for generating applicable and marketable knowledge (Scott, 2003)¹.

Numerous benefits may result from the interaction between the academic and business worlds. Bonaccorsi and Piccaluga (1994) have identified at least four reasons why industrial sectors would be encouraged to have a strong relationship with universities: 1) obtaining quick access to scientific advances; 2) increasing feasibility through scientific models; 3) delegating selective development activities, including risk sharing and reduction of certain costs and 4) resolving the shortage of resources, such as laboratories and equipment. Universities also have incentives to pursue the relationship with industry. Romero (2007) summarizes three reasons—seeking of knowledge, political issues and financial aspects—that promote this interaction: 1) increasing the access to the knowledge generated in companies; 2) the belief that university-industry collaboration maximizes the probability to capture public research funds, and 3) industry would fund the research done in universities. Hence, since there are incentives for both sides to interact a strong bidirectional relationship between universities and industrial sectors should be observed.

In this sense independent or intrapreneurial entrepreneurship ventures could emerge in different sectors and in different manners, (Sharma and Chrisman, 1999; Parker, 2011). Many of the real and potential interactions between universities and industry could also be a trough of new business creation. For example many new technology companies may be closely related with the research done in universities within the area (Bania *et al.*, 1993; Markman *et al.*, 2005) even though not all research carried out in universities necessarily results in new products or services (Pavitt, 2001). However, the interaction between certain industry researchers and scholars can develop patterns of cooperation, which stimulates technological processes that increases productivity (Romer, 1986, 1990; Lucas, 1988), and also may affect the ability to identify and exploit (new) business opportunities (Cohen and Levinthal, 1989).

¹ The academic literature has identified eight different ways, both formal and informal, of the formation of connections between industrial sectors and universities, which are: 1) joint laboratories; 2) independent companies resulting from strategic alliances (spin-off); 3) licensing agreements; 4) R&D contracts; 5) publications together; 6) presentation of results through conferences, exhibitions and media; 7) informal networking professionals, and 8) the flow of graduates to the productive sector (OECD, 2000).

The identification and exploitation of opportunities is one of the core aspects of the entrepreneurship process (Shane and Venkataraman, 2000). While some universities offer courses about entrepreneurship, especially through their business schools, generally these courses tend to focus on explaining the process of new venture formation and the recognition of business opportunities rather than assisting students in actually creating their own ventures. This could explain why most of those who receive this type of education do not necessarily have the intention to start a new business and throughout their education there is a variation in their entrepreneurial propensity. In this sense, voluntary education about entrepreneurship is more effective than a mandatory courses in increasing entrepreneurial intentions (Albornoz *et al.*, 2011).

Beyond those courses about entrepreneurship, GEM data provide evidence that entrepreneurial education is inadequate in all educational levels. It is noteworthy that GEM defines entrepreneurial education as a set of knowledge and skills related to starting a new business (Coduras *et al.*, 2010). This definition includes technical concepts, but also leadership skills, confidence and teamwork, among others. Therefore, it has been suggested that business schools probably are not the best developers of entrepreneurs (Katz, 2003).

The effect of universities on entrepreneurship should be explored in at least a couple of dimensions. Firstly, since increasingly most universities incorporate within their missions collaboration for social and economic growth, somehow this aspiration may affect entrepreneurial activity (Etzkowitz, 2003), since entrepreneurship generates an increase in social and economic welfare (Audretsch, 2004). Secondly, the university environment itself may impact the entrepreneurial spirit by increasing intentions to start businesses (Walter *et al.*, 2006, Krueger and Brazeal, 1994).

2.2. University entrepreneurship education: a regional approach and previous evidence from Chile

Mueller (2007) notes that geographical proximity plays a fundamental role for the efficient transfer of knowledge from universities to businesses. Coduras *et al.* (2008) found that in Spain the support of universities in promoting entrepreneurship does not provide statistically significant results to affect entrepreneurial activity in the country, despite evidence at the regional level, where regions with a higher entrepreneurial population level are also those who tend to perceive better university support.

Moreover, knowing someone who has created a new business, believing that one possesses the skills and knowledge to recognize good business opportunities; having training and perceiving that the university provides good support increases the likelihood of having entrepreneurial intentions. In this sense, there would be an impact on potential entrepreneurs. This study is based on diverse theories that explain the influence of the environment on individual intentions (Ajzen, 1991; Krueger and Brazeal, 1994). While in Chile there is a general perception regarding the limited link between entrepreneurs and universities (Amorós and Poblete, 2011), we state that in regional-

aggregate terms there could be a positive potential interaction between universities and new business creation. As a consequence our first exploratory hypothesis is:

Hypothesis 1: At regional level, greater support given by universities through entrepreneurship education, increases early-stage entrepreneurial activity.

Empirical data in Chile indicates that the education variable (for entrepreneurship) is one of the most negative variables of the entrepreneurial framework conditions and local experts agree that an important constraint to the development of entrepreneurial activity is due to the limited training that currently available (Amorós and Poblete, 2012). Similarly, national and regional experts agree that local universities have not been able to properly transfer knowledge and technologies to entrepreneurs and only some companies, usually large and established, have a greater contact with educational institutions and therefore only those big/established companies would benefit from the advantages of the relationship. From the results observed in Spain, and based on the previous findings in Chile, we believe that there is not enough formal contact between universities and entrepreneurs to have an impact on entrepreneurial activity. Furthermore, it is likely that entrepreneurial intentions will not be affected significantly. Based on these antecedents we state our second hypothesis:

Hypothesis 2: The university-based entrepreneurship education has no significant influence on the intentions to be an entrepreneur in Chile.

3. Methodology

3.1. General data description

As has been already mentioned in the introduction, the data in this study come from the Global Entrepreneurship Monitor (GEM). The information used in GEM is collected through various primary and secondary sources (Reynolds *et al.*, 2005). Primary data from GEM comes from two surveys: the first one named the Adult Population Survey, APS, which collects information related to entrepreneurial attitudes of the population, entrepreneurial activities and entrepreneurs' aspirations. The second instrument is denominated National Expert Survey, NES, that provides information about the environment (entrepreneurial framework conditions) in which entrepreneurs should play at a national or regional level (Bosma *et al.*, 2012)².

The APS is a random survey of the population over 18 years old, which is stratified by gender, age and regions. In the case of Chile the stratification information is provided by the National Statistics Institute (INE) from the last Census conducted. The methodology of GEM (Reynolds *et al.*, 2005) requires a minimum of 2,000 cases nationwide, however, in the case of Chile and other countries, because it is

² For additional information about APS and NES foundations see Reynolds *et al.* (2005). Both surveys are in the public domain at www.gemconsortium.org.

performed at a regional level, 500 additional cases are added in each of the regions involved in the project. The GEM Chile project since 2007 has incorporated into its analysis a regional approach. By 2012 of the 15 regions, 12 have been involved in the project. This allows GEM indicators to project the entire adult population between 18-64 years of age (representing the majority of the economically active population) in every studied region. Table 1 summarizes the participation of the different regions of the country.

The NES requires that at least 36 experts be contacted where at least four of them must be a specialist in each of the nine entrepreneurial framework conditions. These nine conditions are: entrepreneurial finance, government policies, government entrepreneurship programs, entrepreneurship education, R&D transfer, commercial and professional infrastructure, Entry regulation, Physical infrastructure, and Cultural and social norms. Experts answer the degree of agreement or disagreement with certain statements that are made on a Likert scale of 5 points (where 1 means strongly disagree and 5 completely agree) and the results at the regional and national level are presented as the mean of each response.

Table 1. Regions involved in GEM Chile, by year

	<i>Region</i>	<i>2007</i>	<i>2008</i>	<i>2009</i>	<i>2010</i>	<i>2011</i>	<i>2012</i>	<i>Total</i>
I	Tarapacá				X	X	X	3
II	Antofagasta	X	X	X	X	X	X	6
III	Atacama				X	X	X	3
IV	Coquimbo		X	X	X	X	X	5
V	Valparaíso	X	X	X	X	X	X	6
VI	Lib. Bdo. O'Higgins				X	X	X	3
VII	Maule				X	X	X	3
VIII	Bío - Bío	X	X	X	X	X	X	6
IX	Araucanía		X	X	X	X	X	5
XIII	Metropolitana	X	X	X	X	X	X	6
XIV	Los Ríos	X						1
XV	Arica y Parinacota			X	X	X	X	4
	Total	5	6	7	11	11	11	51

3.2. Analysis 1: Entrepreneurship education at universities and early-stage entrepreneurship at the regional level

Sample

In order to test the first hypothesis we used GEM data (both APS and NES) at a regional level from 2007 to 2012. APS at the regional level provides us the informa-

tion about entrepreneurial activity, and we used the experts view, taken from the NES database, to measure the university support for entrepreneurship.

Variables

As pointed out in the previous section, the relationship between universities and the business world, and therefore to entrepreneurship, can come from different areas and through formal and informal channels. The variable used in this research to measure the level of support from universities with entrepreneurial activity is as follows:

Do you consider that colleges, universities and higher education institutions provide adequate and quality preparation for starting up and growing new firms?

This variable is in the NES database. Therefore the experts in each region are the ones who—in a Likert scale of 1-5, with 1 being completely disagree and 5 completely agree—respond according to their perceptions of the local reality. From this we calculate a simple average of all expert responses.

Entrepreneurial activity

Three variables were selected to assess any changes in the entrepreneurial activity, the first one represents those who manifest to be early-stage entrepreneurs (TEA). GEM defines early-stage entrepreneurial activity as the percentage of the population, 18-64 years old, that currently own a new business for a period of less than 42 months. The second and third variable is derived from the TEA, but incorporates the educational level of entrepreneurs where the cut is given by whether or not they had college education. Thus, the second variable is the percentage of population with university education who is an entrepreneur and the third is the percentage of the population with no university education who is an entrepreneur. We consider university-educated individuals to be those respondents who indicated their last education level to be: incomplete university education, complete or some graduate studies (whether Master, PhD, Doctorate or equivalent). Similarly, those with their last educational level listed as primary education, secondary or technical training, are considered as individuals with no college education.

3.3. Analysis 2: Entrepreneurial intentions and specific entrepreneurship education in the university

Sample

For a second analysis we use variables taken only from the APS database. This second analysis looks to see the relationship between having had entrepreneurship education at university and the probability of being a potential entrepreneur.

In relation to the variable of entrepreneurship education in college, in 2008 a series of questions were added as part of the special topic (Education for entrepreneurship) in the adult population survey (APS), which emphasized the educational institution where it was made and whether the training was voluntary or mandatory. The variable used in this study was constructed by grouping all those who reported having received entrepreneurship education in college, regardless of whether it was mandatory or not. Since these questions were added only in 2008, the second analysis, which is related to the entrepreneurial intention, was performed using the database only for this year.

Variables

The variables measure: 1) entrepreneurial intentions; 2) contact with other entrepreneurs; 3) perception of good business opportunities; 4) recognition of having entrepreneurial skills; 5) fear of failure, and 6) possessing entrepreneurship education in college. The six variables are dichotomous, where the first five are derived from individual questions and the answer must be yes or no.

4. Results

4.1. Analysis 1: Entrepreneurship education at universities and early-stage entrepreneurship at regional level

Table 2 shows that apparently there is no clear pattern between perceived educational support of the universities and the percentage of the population with university education who is an entrepreneur. In this table, the data is sorted with respect to the average university support. It should be noted that the level of entrepreneurship in Chile during the period 2007-2012 had been steadily increasing. However, since 2011, the levels were significantly higher than what had previously been observed in the country (Amorós and Poblete, 2012).

Table 3 presents the correlation between different types of entrepreneurs with the level of support from universities. In this table we see that there is no statistically significant relationship between any of the variables that measure the support of universities perceived by the experts. Thus, we find no evidence of a relationship between the support of universities with the level of entrepreneurship in each region. In fact, it is only possible to state that the only variables shown to be related is the percentage of the population without university education who is an entrepreneur and TEA. This is consistent with the typical Chilean entrepreneurial profile (Amorós and Poblete, 2011). While these results were expected from table 2, the results might be interesting since they reveal a gap between university education and the creation of new businesses. In Chile, the universities have failed to have sufficient impact to alter the level of entrepreneurial activity.

Table 2. Total entrepreneurial population, population with and without university education who is an entrepreneur and university support, by region and year

<i>Year</i>	<i>Region</i>	<i>Total population TEA (%)</i>	<i>University education TEA (%)</i>	<i>No university education TEA (%)</i>	<i>Mean of universities support</i>
2009	Bío - Bío	14.4	14.3	12.8	2.97
2011	Lib. Bdo. O'Higgins	22.9	22	16.2	2.94
2008	Bío - Bío	15.4	15.9	12.3	2.91
2011	Valparaíso	21.3	21.3	17.2	2.86
2011	Maule	27	26.1	22.3	2.85
2011	Coquimbo	28.4	35.7	22.1	2.83
2010	Valparaíso	14.8	18	14.2	2.83
2009	Metropolitana	13.7	13.2	11.3	2.82
2011	Metropolitana	22	26.3	18.7	2.81
2009	Antofagasta	17.4	22.8	15	2.81
2010	Lib. Bdo. O'Higgins	16.3	16.1	16.4	2.8
2009	Valparaíso	16.4	17	13.5	2.79
2007	Bío - Bío	11.1	10.1	14.1	2.77
2010	Antofagasta	14.3	19.8	13.1	2.74
2007	Valparaiso	13.3	15.6	10	2.71
2010	Tarapacá	14	19.1	12.8	2.68
2012	Valparaíso	23.8	25.6	22.7	2.67
2010	Coquimbo	15.3	19.6	14.3	2.67
2009	Coquimbo	15.1	17.3	12.4	2.67
2011	Antofagasta	27.5	28.1	22	2.65
2010	Metropolitana	16	20.2	14.8	2.64
2012	Maule	22.5	25.1	21.3	2.63
2012	Bío - Bío	20.5	20.1	20.8	2.62
2008	Valparaíso	12.6	13.3	9.4	2.6
2012	Lib. Bdo. O'Higgins	22.6	24.2	21.6	2.59
2010	Maule	23.2	25.7	22.6	2.59
2011	Tarapacá	29.3	25.4	25.2	2.56
2010	Bío - Bío	19.7	17.4	20.1	2.56
2012	Araucanía	22.3	23.5	21.6	2.53
2012	Arica y Parinacota	23.8	21.9	25	2.53
2011	Arica y Parinacota	27.7	33.7	23.6	2.53

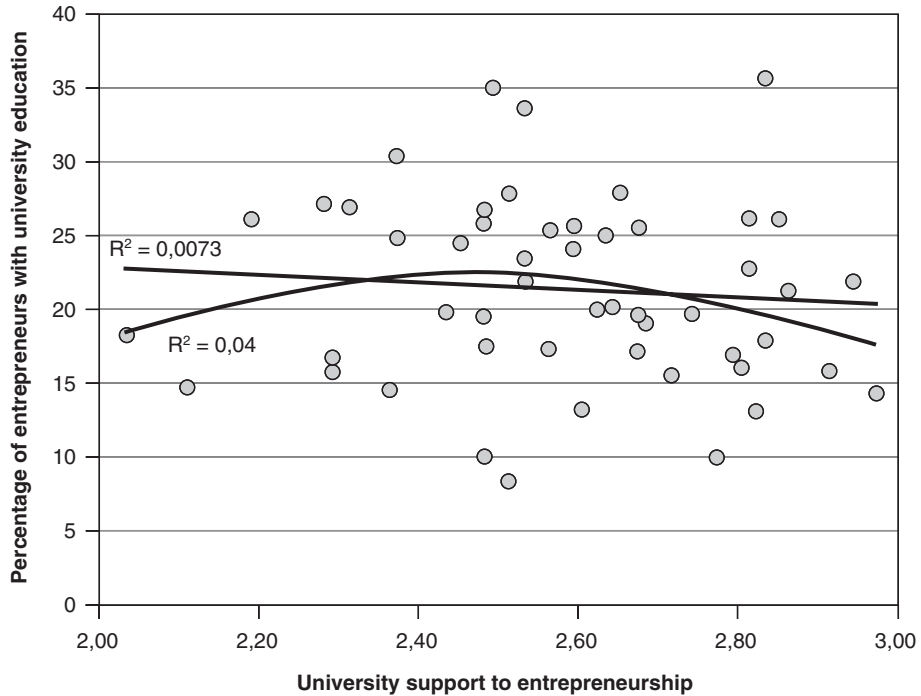
Table 2. (continue)

<i>Year</i>	<i>Region</i>	<i>Total population TEA (%)</i>	<i>University education TEA (%)</i>	<i>No university education TEA (%)</i>	<i>Mean of universities support</i>
2012	Coquimbo	24.5	27.9	22.5	2.51
2008	Metropolitana	10.2	8.5	9.5	2.51
2011	Araucanía	23.7	35.1	21	2.49
2012	Tarapacá	26.9	26.9	26.9	2.48
2010	Atacama	15.4	25.9	13.1	2.48
2009	Arica y Parinacota	17.8	17.6	14.9	2.48
2008	Coquimbo	17.6	10.2	15.5	2.48
2007	Metropolitana	16.2	19.6	12.7	2.48
2010	Arica y Parinacota	18.6	24.6	17.8	2.45
2009	Araucanía	16.6	19.9	12.5	2.43
2012	Antofagasta	24.7	30.4	20.9	2.37
2011	Atacama	26.4	25	23.3	2.37
2008	Araucanía	15.4	14.7	13.3	2.36
2012	Metropolitana	23.6	27	21.7	2.31
2010	Araucanía	13.5	15.9	12.9	2.29
2008	Antofagasta	15.9	16.8	12.7	2.29
2011	Bío - Bío	21.3	27.3	18.2	2.28
2012	Atacama	25.4	26.2	25.1	2.19
2007	Antofagasta	13.3	14.8	12.5	2.11
2007	de los Ríos	13.9	18.2	10.8	2.03

Table 3. Correlation analysis between different TEA's and the perception of universities support to entrepreneurship

	<i>Support of universities to entrepreneurship</i>	<i>Total population TEA (%)</i>	<i>University education TEA (%)</i>	<i>No university education TEA (%)</i>
Support of universities to entrepreneurship	1			
Total population TEA (%)	-0.033	1		
University education TEA (%)	-0.085	0.839**	1	
No university education TEA (%)	-0.088	-0.934	0.751**	1

Figure 1. Lineal and cubic curve of the relationship between the percentage of the population with university education who is an entrepreneur and university support



As is observed in figure 1, for the Chilean case, the support given by universities to entrepreneurship with the percentage of university-educated entrepreneurs demonstrates a complex relationship. In Chile, through a linear or cubic regression, there is negligible chance to find a statistical relationship amongst the variables. The low R^2 observed in both cases confirms that these models are not sufficient to infer the interaction between these variables. Despite this, bearing in mind the low predictability that the nonlinear regression demonstrates, the model indicates that the support given by the universities to entrepreneurship increases entrepreneurial activity to a certain level, close to 23%. Yet it later decreases.

We conclude in an exploratory way that we can not confirm our Hypothesis 1 which suggested that greater support given by universities though entrepreneurship education would result in higher early-stage entrepreneurial activity

4.2. Analysis 2: Entrepreneurial intentions and specific entrepreneurship education in the university

The second analysis was performed in order to analyze another approach to measure the impacts the universities have on developing entrepreneurship. Through logistic regression we wanted to test whether having entrepreneurship education in university impacts entrepreneurial intentions. Unlike the previous analysis, which was regional, this is at an individual level and only uses 2008 data.

Table 4 provides a descriptive analysis of the variables used, table 5 shows the correlation between the variables of the model and table 6 summarizes the results of the logistic regression. The correlation table shows how most of the variables analyzed are related to the expectations of starting up, except for the perception of the support given by the universities. While fear of failure and age have an inverse relationship with entrepreneurial intentions, the other variables show a direct relationship.

Table 4. Descriptive information about the variables used in the entrepreneurial intention model

<i>Binary variables</i>	<i>Frecuence</i>	<i>Porcentaje</i>
Entrepreneurial intention (1 = yes)	1,490	34.2
Entrepreneurship education in university (1 = yes)	323	16.2
Know others entrepreneurs (1 = yes)	1,571	47.8
Perceived future good business opportunities (1 = yes)	846	30.1
Skills and knowledge to initiate a new business (1 = yes)	2,038	63.1
Fear of failure prevent initiate a new business (1 = yes)	1,207	37.2
Gender (1 = male)	1,845	40.9
<i>Continued variable</i>	<i>Average</i>	<i>Std. Dev.</i>
Age	42	21.553

Regarding the likelihood of having entrepreneurial intentions, in table 6 we see that it is higher in people who know someone who has created a new business, perceive that she has the knowledge and skills to initiate a new business and advancing age decreases the propensity of being an entrepreneur. Having entrepreneurship education in university, gender and fear of failure were not significant predictors of the propensity to have entrepreneurial intentions.

Based on the previous results we confirm our Hypothesis 2 related to the fact that in Chile university-based entrepreneurship education has no significant influence on the intentions to be an entrepreneur.

Table 5. Correlation Matrix

	1	2	3	4	5	6	7	8
1. Entrepreneurial Intention	1							
2. Entrepreneurship education in university	0.128**	1						
3. Know others entrepreneurs	0.272**	0.159**	1					
4. Perceived future good business opportunities	0.162**	0.017	0.120**	1				
5. Skills and knowledge to initiate a new business	0.306**	0.225**	0.249**	0.126**	1			
6. Fear of failure prevent initiate a new business	-0.107**	-0.092**	-0.075**	-0.125**	-0.163**	1		
7. Gender	-0.128**	-0.158**	-0.098**	-0.084**	-0.210**	0.116**	1	
8. Age	-0.101**	-0.186**	-0.151**	-0.060*	0.040	0.050*	0.026	1

Table 6. Estimated probabilities for entrepreneurial intentions in people with university education

	<i>B</i>	<i>T.E.</i>	<i>Wald</i>	<i>gl</i>	<i>Sig.</i>	<i>Exp(B)</i>	<i>C.I. 95% EXP(B)</i>	
							<i>Low</i>	<i>High</i>
Entrepreneurship education in university	0.121	0.218	0.307	1	0.580	1.128	0.736	1.730
Know others entrepreneurs	0.631	0.172	13.423	1	0.000	1.879	1.341	2.633
Perceived future good business opportunities	0.393	0.184	4.552	1	0.033	1.482	1.033	2.127
Entrepreneurial skills	1.532	0.202	57.351	1	0.000	4.628	3.113	6.880
Fear of failure	-0.253	0.180	1.980	1	0.159	0.777	0.546	1.104
Gender	0.014	0.173	0.006	1	0.936	1.014	0.722	1.425
Age	-0.023	0.006	13.486	1	0.000	0.978	0.966	0.989
Constant	-1.066	0.414	6.632	1	0.010	0.344		
<i>Statistics</i>								
Number of cases	751							
R ² Nagelkerke	0.175							
R ² Cox and Snell	0.241							

5. Conclusions and implications

In Chile, the level of contact between universities and the business world is scarce. Entrepreneurs generally do not receive enough support from the universities to encourage the creation of new businesses. Mueller (2007) points out that, despite the relevance of all forms of entrepreneurship, an increase in entrepreneurial activity that incorporates innovation is more crucial than entrepreneurial activity in general. Therefore the low linkages observed between universities and entrepreneurship avoids contact with a potential provider of innovation. Additionally, Mueller (2007) suggest that in order to make an efficient transfer, an important component is the geographical proximity. Regions with little research would be characterized by a low capacity to absorb new knowledge, which means they experience lower levels of economic growth.

From the observed data, we can suggest that the support provided by universities has no direct impact on promoting entrepreneurship. In this sense, the benefits that could be generated would not be achieved. This result is also similar in other countries (Arenius and Ehrstedt, 2008). Certainly several aspects may help to understand this phenomenon. One is that in general entrepreneurship education in universities is not well developed across the country and there is little variation among the regions (Amorós *et al.*, 2013). Other potential issues in Chile, relates to intellectual property rights. The fact that the legislation, and the local culture itself, fails to establish trust

in those who develop new products or knowledge may explain why it is hard to observe a formal link between scientists and entrepreneurs (Poblete and Amorós, 2010). Moreover, the lack of transfer of R&D, which is strongly related to the previous topic, is also limiting the development of entrepreneurial activity in Chile.

At an individual level we find that people who have a university degree, and had specific entrepreneurship education do not have a higher propensity to become entrepreneurs than those who had no entrepreneurship education. However, we found new empirical support in this study regarding the perception of good future opportunities; meeting other entrepreneurs, and the perceived skills to initiate a new business with entrepreneurial intentions. This has been thoroughly studied in the literature and the results of this study simply confirm this relationship (Kwon and Arenius, 2010).

In Chile, the development of research is concentrated mainly in universities and given the results observed in this study, there is a void that would be hurting all society actors who have not been able to reap the benefits achieved from a strong relationship between universities and entrepreneurs. GEM reports in Chile (Amorós and Poblete, 2011, 2012) states that in general in the early-stage entrepreneurial activity and in the established one, entrepreneurs do not incorporate new technologies and the percentage of university-educated entrepreneurs are a minority of total entrepreneurs in the country.

The results obtained from these studies may be limited by the specific characteristics of the variables used to measure each aspect, and also the sample used in each study (regional and individual approach) could restrict the outcome achieved. Therefore there is a possibility that a similar study using others variables may present different results than the ones we exposed in this work.

Because this study is based on previous research conducted in Spain by Coduras *et al.* (2008), future research could explore an in-depth comparison of these countries using merged databases to explore the relationship between entrepreneurship education and new business activities on a regional basis. Both countries have some similarities on the composition of the early-stage entrepreneurial activity. Both are mainly focused on providing services to the consumer. In relation to technology, which could be associated with R&D in universities, in both cases, close to 6% of early-stage entrepreneurial activity is in technology industries. The differences between the two countries are seen primarily in terms of attitudes toward entrepreneurship. In Chile there is a significantly higher percentage of entrepreneurial intentions, perception of good opportunities, perception of knowledge and entrepreneurial skills and lower levels of fear of failure. Moreover, the levels of entrepreneurial activity in Chile are significantly higher than in Spain. The generation of necessity entrepreneurship in terms of the total percentage of entrepreneurship is similar in both countries. The biggest difference is given mainly by the entrepreneurs motivated by the search for greater incomes, which in Spain is less common.

In Chile the population's attitudes toward entrepreneurship are higher than those observed in Spain, which may help to explain the difference between the impacts of universities on the propensity to become potential entrepreneurs. In comparison

terms, it is possible that in Spain, in the context where there are low entrepreneurial attitudes developed in the population, the effort of universities is sufficient to generate a change at least in terms of propensity to demonstrate entrepreneurial intentions.

Because the support given by the universities is analyzed in relation to the perception of experts only in this study, the results are subject to biases inherent in those who were chosen as experts. Future research should analyze whether it is possible to demonstrate an empirical relationship between the contribution given by universities and the potential impact it could generate. As we demonstrated in this study, we could not observe a significant direct contribution, but maybe it exists as a mediator between the attitudes towards entrepreneurship and entrepreneurial intentions, or in the creation of new businesses.

6. References

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