

Entrepreneurial opportunities in peripheral versus core regions in Chile

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Abstract Governmental policies tend to support and boost entrepreneurship in peripheral regions in many countries. This research revives the debate about specific regional policies designed to foster local new business creation, and the entrepreneurial framework conditions needed at the regional level for emerging regions such as Latin America. We applied one of the Global Entrepreneurship Monitor's methodologies, the National Experts Survey, to a sample of 695 key informants in Chile at eight regions of which six are classified as peripheral. Using non-parametric statistics we compared the differences between peripheral and core regions. The main results indicate that peripherally located entrepreneurship experts perceive their regions as in a worse position than centrally located experts in terms of finance access and physical infrastructure. On the other hand, the results indicate that peripheral entrepreneurship experts detect more market

dynamism in their regions and surprisingly perceive general policy and government programs as supporting entrepreneurship although the Chilean government had not promoted many regional policies.

Keywords Entrepreneurship framework conditions · Regional policy · Global Entrepreneurship Monitor · Chile · Entrepreneurship

JEL Classifications L26 · O18 · R58

1 Introduction

Empirical work has highlighted the role of entrepreneurship and new venture creation as a mechanism for employment creation, innovation and economic growth (Thurik and Wennekers 2004). Nevertheless, the relationship between entrepreneurship and economic development is a rather complex one. Some evidence finds that the relative contribution of new ventures and growing firms to economic development is still controversial (Fritsch and Mueller 2004) and that it may impact the output differently across nations (Sternberg and Wennekers 2005) and may also vary over time (Acs and Amorós 2008; Henrekson and Johansson 2008; Acs et al. 2009). In this regard, there are several economic and noneconomic factors that influence entrepreneurial activities (De Clercq and Arenius 2006; Levie and Autio 2008; Frederick and

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Monsen 2009). The entrepreneurship dynamic could be linked to Baumol's (Baumol 1990, p. 899) proposal that "entrepreneurial behaviour changes direction from one economy to another in a manner that corresponds to the variations in the rules of the game". Since its inception, the Global Entrepreneurship Monitor (GEM) project (Reynolds et al. 1999) shows that the entrepreneurial activity is particularly shaped by a distinct set of factors called entrepreneurial framework conditions (EFCs). According to GEM, the EFCs are "the necessary oxygen of resources, incentives, markets, and supporting institutions to the growth of new firms" (Bosma et al. 2008, p. 40). These EFCs are clearly related to Baumol's concept of rules of the game. Hence, it is expected that different countries and regions have different EFCs or different "rules of the game", which may affect the inputs and outputs of entrepreneurial activity.

While some research (i.e. the GEM reports) provides analyses of entrepreneurship issues in different countries and between countries, there is a need to deal with comparisons between regions in same countries (Audretsch and Fritsch 1999; Johnson 2004; Verheul et al. 2009), which highlight differences between core and peripheral regions. Such differences may exist especially in countries where peripheral regions are distant from core regions (Christaller 1966). For example, in the policy practice, the role of entrepreneurship in promoting catch-up for under-performing regions in Europe has been at the heart of national government and European Union policy and endorsed by the OECD for many years (OECD 1998; European Commission 2003). This mismatch between theory, practice and policy, and the gap in evidence is the starting point of this study.

Accordingly, this paper deals with the different perceptions of entrepreneurship from core and peripheral areas in Chile, about the conditions to develop and enhance entrepreneurship activities, and it explores the ways in which new governmental policies may foster entrepreneurship in more deprived peripheral regions. This is one of the first academic research studies at the regional level in Chile to study this phenomenon specifically, and therefore it represents a contribution to the emerging literature on entrepreneurship and regional development in the Latin-American context (West et al. 2008). To conduct it, we relied on data from the GEM

Chile project using longitudinal data covering 2007–2009, which probably represents the largest data-gathering project in the field of entrepreneurship in Latin America.

2 Theoretical development: core versus peripheral aspects of entrepreneurship

Geographical factors affect economic growth in the development of transportation routes and natural resources that encourage firms to locate in specific regions where manufacturing costs are minimized, which subsequently evolve into industrial districts and then agglomerations (Marshall 1895; Weber 1909). It has been suggested that the geographical location factor may not effectively matter for high-tech companies since these firms deal with low-weight/high-value inputs and outputs (Cooper 1993). The theoretical literature on core versus peripheral economies suggests that uneven distribution of human, social and financial capital in a nation, reinforced by migration and the tendency of individuals to associate in groups on the basis of similarity, can set up a virtuous cycle of entrepreneurship in agglomerations and a vicious cycle of dependence in the periphery (Bosma et al. 2009). Some studies have argued that this can result in unintended negative effects of regional policy in peripheral regions (Mueller et al. 2008), although this is based on limited evidence and other studies yield mixed findings (Chrisman et al. 2002).

Saxenian's (2006) portrayal of Silicon Valley demonstrates the importance of location, while at the same time noting that entrepreneurs with strong social networks in the Valley can operate from external locations. In an era in which natural resources are becoming depleted, this phenomenon may be better explained by the notion of density of human capital, i.e. regional availability of highly educated and productive people (Florida 2003). Human capital levels in peripheral areas on average are lower than in urbanized regions (Mueller et al. 2008; Van Stel and Suddle 2008). This phenomenon may be due to the movement of a highly educated workforce away from periphery to larger cities where employment and entrepreneurship opportunities are better. This, in turn, may cause the average start-up in a peripheral area to have access to a lower quality of

human capital compared to the average start-up in an urbanized region. In addition, the cause of regional entrepreneurial underdevelopment could be found in the high risk perceived by entrepreneurs as well as fund providers. The advantage of central location such as the Silicon Valley in hiring good people and getting market notice tends to distract investors from peripherally located ventures (Roberts and Barley 2004; Saxenian 2006). As a result, in comparison to high technology industries, traditional industries show higher levels of concentration in the peripheral regions. This is the reason why governments try to turn around this unfavourable situation by offering generous grants in order to attract investments into peripheral areas, though with rather meagre success (Frenkel et al. 2003).

It is far from obvious that potential regional policies designed to maximize the number of start-ups in peripheral areas will have the desired effects on the regional economy. Lerner (2009) asserted that many entrepreneurship promotion programs were not effective, or even far more often than not, these public programs have been failures. Some ways in which governments can effectively promote the entrepreneurial sector is through policies that create an overall climate conducive to entrepreneurship and venture capital. Examples of such policies, according to Lerner (2009), include legal systems that recognize convertible preferred stock and legislation that facilitates technology licensing from universities. Several studies (Florida 2003; Psaltopoulos et al. 2005; West et al. 2008;) suggested that on top of the traditional formula of financial incentives and organized business incubators to attract manufacturing facilities, the main task of regional development policy should include the development of entrepreneurial orientation, social networks resources, knowledge resources, as well as attracting and sustaining talented and creative people who are the driving force behind regional development. Local agents should be transformed into active subjects within innovative processes and networks designed to identify renewed economic opportunities on environmentally and socially sustainable bases (Cannarella and Piccioni 2006).

Another aspect to consider is the fact that peripheral and especially rural areas are usually economically weaker or even deprived (Cannarella and Piccioni 2006). This phenomenon was demonstrated

throughout studies conducted in different countries, both underdeveloped such as El Salvador (Lanjouw 2001) and developed such as Canada (Polese and Shearmur 2006) or the United Kingdom (Kalantaridis 2009). More specifically in the field of entrepreneurship this phenomenon was supported to a certain extent by various empirical studies. For example, previous studies conducted in different developed countries in Western Europe, such as Austria (Todling and Wanzenbock 2003), the United Kingdom (Johnson 2004; Burke et al. 2009), the Netherlands (Van Stel and Suddle 2008) and in the United States (Headd 2003) mainly showed that core regions showed more propensities for fostering entrepreneurial activities. Therefore the level of entrepreneurship in peripheral regions, such as Northern England or Scotland within the UK, was weaker.

The general economic advantage of highly dense urban regions is also widely explained by the agglomeration effects in literature (Davelaar and Nijkamp 1987; Florida 2003; Todling and Wanzenbock 2003; Van Stel and Suddle 2008). This includes: a density of potential entrepreneurs; a highly educated population; a large potential market, in terms both of customers and of suppliers and services; and knowledge spillovers from universities and research institutions.

Our research specifically focuses on the concept of peripherality, which is concerned with the effect of distance of the economic core in reference to the periphery. Based on the extant literature on entrepreneurship and regional development, our main research questions are related to the significant differences between centrally located entrepreneurs (CEE) and periphery located entrepreneurs (PEE) on the development of entrepreneurial opportunities. In this context we explore the perceived governmental policies that may help to promote entrepreneurship in peripheral regions of Chile.

3 Study area and research methodology

3.1 The Chilean environment

Chile is a good case for this kind of study due to its shape, being one of the longest countries in the world with 4,600 km of Pacific coastline and only 250 km in its widest part. Specifically, the target locations of

this study are eight out of fifteen regions in Chile. For the purposes of data collection, in this study peripheral regions are those located at the sub-national/regional levels in the North (Región de Arica y Parinacota, Región de Antofagasta), Middle North (Región de Coquimbo) and South (Región del Bío-Bío, Región de Los Ríos and Región de la Araucanía) of Chile, and core regions are those located in the metropolitan areas of Santiago and Valparaíso. Santiago is the capital of Chile, and contains forty percent of the country's population and economic activity; Valparaíso is a conurbation-metropolitan area that includes the cities of Viña del Mar and Valparaíso County and is only 90 km distant from Santiago. These two regions together are usually considered the main central region of the country. 'Peripheral entrepreneurship experts' reside and operate at the sub-national level in the south and the north of Chile; these regions are more than 800 km away from the core regions of Santiago and Valparaíso. Northern regions have been related to mining industries, mainly copper extraction. The Middle North also has important copper mines and agribusiness activities related to fruit production, mainly of grapes. As a result some entrepreneurial activities were primarily related to industries based on natural resources and complementary services like retail (Amorós et al. 2010). Southern regions are more commonly characterized by forestry activities, including lumber and cellulose production, and such other agribusinesses as cattle rearing and dairy production. The fishing industry is another dynamic sector in the Southern regions, mainly in Bío-Bío, but the extensive Chilean littoral also provides similar fishing developments, both in the north and south. Summarizing, many natural resource-based industrial sectors are the most important elements of the Chilean economy, generating a high percentage of employment outside the metropolitan areas and exporting at high levels of international competitiveness (Felzensztein et al. 2010).

In terms of economic participation there is a large difference between core regions and peripheral regions. According to the Central Bank of Chile (2010), the Santiago Metropolitan Region and Valparaíso represent 57.08% of the total GDP (2009 estimations at 2003 constant prices) and enjoyed 4.78% in economic growth, while in peripheral regions economic growth was measured only at

4.04% (values of annual percentage change at constant prices). The economic, geographic and demographic profiles provide a clear distinction between peripheral versus core regions (see "Appendix 1" section). Focusing this study on quasi-homogeneous sub-national regions (northern and southern Chile), gives the opportunity to collect in-depth information about the existing differences between peripheral and core areas in terms of entrepreneurial framework conditions.

3.2 Data collection

In order to assess the different entrepreneurial framework conditions, we followed the National Experts Survey (NES), one of the worldwide standard questionnaires of the GEM methodology (Levie and Autio 2008). The NES foundations are based on the lack of national-harmonized indices or measures that could be utilized as indicators of specific entrepreneurial framework conditions¹ (Reynolds et al. 2005). The NES uses qualitative information based on informed judgments of national, in our case also regional, experts regarding the status of entrepreneurship in their own countries and/or regions. National and regional experts were selected on the basis of reputation and experience. Because "there is no available list of entrepreneurial experts for any GEM country representative, samples were not feasible. However, an effort was made to ensure that experts with a substantial range of background and knowledge were chosen in each country. National teams were responsible for using their own networks and contacts within the country to select four individuals that were experts for each of the nine entrepreneurial framework conditions" (Reynolds et al. 2005, p. 223); the experts are technically samples of convenience.

The case of Chile is particular because since 2007 the GEM Chile National Team has conducted a specific regional approach that replicates the NES on each of the previously described regions. Each year the key informant experts were personally interviewed and

¹ For NES results and linkage of EFCs with other international measurements see Bosma et al. (2008).

asked to complete the NES self-administered questionnaire. These experts were selected following a strict protocol:

- Regional sub-teams were instructed to select at least four experts considered particularly knowledgeable in each of the general EFCs (9 EFCs \times 4 experts = 36 respondents). Each team has a list with more than 36 experts because if some of them cannot complete the interview because they are active professionals, another key informant who has similar experience and knowledge could replace them.
- The expected four respondents per category consisted of the following characteristics: at least one entrepreneur, at least two suppliers of the EFCs, and at least one observer, such as an academic with specific expertise in the area. In some cases there were more than 36 respondents and only two regions did not complete this number of surveys (see “Appendix 2” section).
- Selection criteria for regional interviewees were related to their regional location and the repercussion of their business or professional activity in the local economic development of the sub-national regions.
- Once contacted with a detailed explanation of the GEM project, virtually all experts agreed to participate in the interview and to fill in the questionnaire. For subsequent years the regional teams were encouraged to contact experts from previous years as respondents for the self-completed questionnaire. The typical rotation is around of 25% of new experts each year.

3.3 Sample characteristics

Core entrepreneurship experts (CEE) are individuals that live and develop their entrepreneurship activities in Santiago and Valparaíso, both regions considered central. Peripheral entrepreneurship experts (PEE) are those who live and develop their entrepreneurship activities at the sub-national levels in six northern and southern regions of Chile. We used the NES regional data collected in the years 2007, 2008 and 2009.

Pooling the three-year data we obtained a final sample of 695 valid cases. From them, 484 experts were classified PEE (70%) and 211 CEE (30%). A description of the principal characteristics of the

entire sample and the two sub-samples is provided in Table 1. Tests were conducted in order to evaluate the similarities of the samples. Pearson’s chi-squared test revealed that the samples were not significantly different, except for two characteristics: the proportion of respondents with vocational or technical training was significantly higher for PEE ($p < 0.01$), and attaining university or college degree was significantly higher for the CEE group ($p < 0.01$).

3.4 Measures

NES is divided into sections that evaluate nine categories: financial support, government policies, government programs, education and training, R&D transference, commercial and professional infrastructure, internal market openness, access physical infrastructure, and socio-cultural norms. Empirical studies (Levie and Autio 2008, p. 248) have shown that government policies, education and training, and internal market present two sub-divisions in each one. In total there are 12 EFCs to evaluate. These 12 factors are measured using multi-item scales that contained between three to seven questions. The questions are answered on a five-point Likert scale (where “completely false” = 1 and “completely true” = 5). The standard NES has 82 questions that also measure other items related to entrepreneurial environment in the country (region). The complete NES is available on request from the authors.²

Following a standard procedure described by Reynolds et al. (2005) we corroborate if the NES’s questions are consistent with the standards for index reliability in social sciences. That means we measure the internal consistency of this group of questions for each EFC, using the Cronbach’s alpha measure.³ Cronbach’s alpha is commonly used to indirectly indicate the degree to which a set of items from a test or survey measures a single unidimensional latent construct. Based on the assumption that intercorrelation among specific questions (each section of NES) measure the same construct, this statistical indicator

² Also see Reynolds et al. (2005) for an extended explanation of GEM’s NES questions.

³ Alfa was development originally to test reliability of psychometric tests (Cronbach 1951). Actually is used in many social sciences to test the reliability of scales that come from standard surveys.

Table 1 Sample composition ($N = 695$)

Sample characteristic		Total	CEE	PEE
Demographics	Average age	46.2 years	44.9 years	46.8 years
	Male	522 ^a (75.2%) ^b	160 (75.8%)	362 (74.9%)
	Female	171 (24.6%)	51 (24.2%)	120 (24.8%)
Educational attainment	Vocational or technical training*	74 (11.2%)	10 (4.9%)	64 (14.1%)
	University or college degree*	518 (77.5%)	191 (93.2%)	327 (70.6%)
	Professional training	332 (50.2%)	114 (55.6%)	218 (47.7%)
	Graduate scholarly work	199 (30.4%)	61 (29.8%)	138 (30.7%)
Expert specialization	Entrepreneur	290 (45.4%)	91 (48.4%)	199 (44.1%)
	Investor	27 (4.2%)	9 (4.8%)	18 (4.0%)
	Policy-maker	96 (15.0%)	23 (12.2%)	73 (16.2%)
	Service provider	142 (22.0%)	44 (23.4%)	98 (21.7%)
	Educator, teacher, researcher	78 (12.2%)	21 (11.2%)	57 (12.6%)

CEE core entrepreneurship experts, PEE peripheral entrepreneurship experts

^a Valid cases for each variable

^b Percentage based on total valid cases for each variable

* Significant difference: Pearson's chi-squared, $p < 0.01$

tells us if it is possible or not to apply a variable reduction procedure like the use of means or other component measures (like factor analysis or principal component analysis). The theoretical range of the Cronbach's alpha is 0–1. Cronbach's alpha test was applied for each of the 12 EFCs.⁴ Results of these analyses are presented in Table 2. As it is possible to observe, most of the alpha coefficients are above the recommended 0.70 proposed by Nunnally (1978), providing evidence of acceptable reliability and also consistent with the cross-national use of NES (Reynolds et al. 2005). As a result we can use variable reduction procedures to analyse the 12 EFCs as described in the next section.

3.5 Method

The methodology to analyse the differences between PEE and CEE had two steps. The first was the principal component analysis and the second was the selection of the appropriate technique to test the differences between the perceptions of these peripheral and core entrepreneurship experts. We proceeded as described in the following sections.

⁴ Alfa calculus procedures are continually improved (Zinbarg et al. 2005) and the most common statistical software use the latest procedures. In our case we used SPSS V. 17.

3.5.1 Variables reduction: principal component analysis

As we described on the previous section, the reliability of the scales permit us to use variable reduction procedures to evaluate the differences between the PEE and CEE. One initial option was to perform a test using the mean values of the 12 EFCs. Instead, we calculated a new set of variables for each EFC using principal component analysis

Table 2 Scale reliability

Scales	Number of items	Cronbach's alpha
Financial support	6	0.791
Government policy: general	3	0.881
Government policy: regulation	4	0.601
Government programs	6	0.774
Entrepreneurial education: primary and secondary	3	0.817
Entrepreneurial education: post school	3	0.789
R&D transfer	6	0.774
Commercial infrastructure	5	0.782
Internal market: dynamics	2	0.900
Internal market: openness	3	0.697
Physical infrastructure	5	0.775
Cultural and social norms	5	0.831

(PCA), rather than mean values. PCA is attractive because it is a well-established statistical standard tool in modern data analysis⁵ for examining complex data, and is simple and easy to implement non-parametric methods for extracting relevant information (Dunt-eman 1994; Stevens 1992). Technically, PCA can be defined as a method to do a linear combination of optimally-weighted observed variables (orthogonal components⁶), which is used to reduce the dimensionality of the data set to a lower dimension to reveal the sometimes hidden (or latent constructs), simplified structures that often underlie it. This reduction in dimensionality contains the majority of the variation within the data set (Jolliffe 2002). This also makes PCA a common methodology to construct indexes from quantitative data (Lagona and Padovano 2007).

In our case the PCA is preferred because it calculates the linear combination of original variables (questions from NES⁷) in a new variable, in this case 12 new EFC values per expert, that accounts for as much information and variation exhibited in the original variables as possible (Hair et al. 1995). In “Appendix 3” section, we present a brief description of each EFCs and their respective specific questions from the NES and the PCA matrixes and total variance explained tables for each EFC.⁸

⁵ PCA was mainly developed by Hotelling (1933) but like many multivariate methods, it was not widely used until the advent of statistical computer software. In our case we use SPSS V. 17.

⁶ For comprehensive technical explanations, mathematical proofs and PCA linear algebra see Shlens (2009).

⁷ It is highly desirable to have at least three (and preferably more) variables loading on each retained component when the PCA is complete. In our case no items were dropped during the course of the analysis because we calculated only one component for each EFC, but it is generally good practice to write at least five items for each construct. For this research we only “violate” this rule with Internal Market: dynamics EFC that only contains two items (see Table 2). The recommendation of the three items per scale should be viewed as an absolute minimum, and certainly not as an optimal number of items per scale. In practice it is common to see that the tests have more than just three items to measure a given construct. On the other hand it is not unusual to see individual scales that include 10, 20, or even more items to assess a single construct. Related to the Cronbach’s alpha, the more items in the scale, the more reliable it will be. For more information on scale construction, see Spector (1992).

⁸ The complete total variance explained tables, component matrix and component score coefficient matrix are available on request from the authors.

3.5.2 Significance tests

In order to select the appropriate procedure to test the differences between the perceptions of these peripheral and core entrepreneurship experts, normality tests were conducted to determine if the values obtained from the participants’ responses were normally distributed. The results of these tests (Kolmogorov–Smirnov and Shapiro–Wilk) revealed that most of the 12 variables considered were not normally distributed for both groups. Therefore, the Mann–Whitney U non-parametric test for means comparisons was selected as the most appropriate method to compare between the previous mentioned groups. This test has been reported as considerably more efficient and robust than *t*-test when sample distributions are not normal (Conover 1998).

4 Results

Results of the Mann–Whitney U test are shown in Table 3. Both principal components and mean values for EFCs have practically the same results. In total, five significant differences were found between the two groups with regard to the studied EFCs: two (financial support and physical infrastructure) showed better perception in core regions while three EFCs (general government policy, government programs and internal markets dynamics) were perceived more favourably in peripheral regions. First, CEE have better perceptions than PEE about the availability of funds for new and growing firms, which includes issues such as the perception of sufficient debt and equity funding available, and sufficient funding from private individuals, venture capitalists, initial public offerings (IPOs) and government subsidies. This result corroborates the ‘common wisdom’ that the central areas of a country (not only in Chile but also practically in many Latin-American and other countries) contain the financial industry activities. Our findings are in line with those studies by Romani et al. (2009) who found “financial gaps” between the Santiago metropolitan zone and the rest of the country. Second, CEE have better perceptions than PEE about the quality, costs, and accessibility to basic utilities and communication services for new and growing firms, issues that included specific perceptions regarding the adequate support for new and growing firms provided by the available physical infrastructure (roads, utilities, communications, etc.).

Table 3 Mann–Whitney U test results

Scales	Group	Valid cases	Mean	Standard deviation	Mean ranges	Mann–Whitney U	Z
Financial support	CEE	211	2.54	0.72	377.90	44752.50	−2.59**
	PEE	484	2.44	0.83	334.96		
Government policy: general	CEE	211	2.37	0.92	317.05	44532.50	−2.69***
	PEE	484	2.60	1.04	361.49		
Government policy: regulation	CEE	211	2.37	0.80	353.92	49813.00	−0.51
	PEE	484	2.35	0.81	345.42		
Government programs	CEE	211	2.61	0.73	327.13	46657.50	−1.81*
	PEE	484	2.71	0.81	357.10		
Entrepreneurial education: primary and secondary	CEE	211	1.67	0.69	331.34	47546.50	−1.47
	PEE	484	1.77	0.78	355.26		
Entrepreneurial education: post school	CEE	211	2.92	0.83	361.64	48183.50	−1.18
	PEE	484	2.80	0.88	342.05		
R&D transfer	CEE	211	2.26	0.71	351.59	50305.50	−0.31
	PEE	484	2.23	0.73	346.44		
Commercial infrastructure	CEE	211	2.77	0.80	354.70	49647.50	−0.58
	PEE	484	2.71	0.83	345.08		
Internal market: dynamics	CEE	211	2.50	1.01	323.68	45929.50	−2.14**
	PEE	484	2.69	1.05	358.60		
Internal market: openness	CEE	211	2.35	0.76	363.66	47757.00	−1.36
	PEE	484	2.27	0.80	341.17		
Physical infrastructure	CEE	211	4.20	0.68	427.89	34205.50	−6.93***
	PEE	484	3.75	0.80	313.17		
Cultural and social norms	CEE	211	2.56	0.82	333.66	48035.50	−1.24
	PEE	484	2.63	0.88	354.25		

* $p < 0.1$, ** $p < 0.05$, *** $p < 0.01$ (two tailed)

This result supports the evident disparity of infrastructure in peripheral regions. If there were indeed important efforts to improving infrastructure in terms of connectivity, not only physically but also in terms of telecommunications, it is clear that most of these types of investments are still being concentrated in Santiago.⁹

On the other hand, PEE have better perceptions than their CEE counterparts with regard to general government policy as well as government programs, meaning a high priority at the local government level to support new and growing firms. In this regard, the results show that CEE have better opinions than CEE related to local (regional) government entrepreneurship programs, for

example, that there are an adequate number of government programs for new and growing businesses. These results might reflect the relevance (and effectiveness) of having policies and programs best suited to each region context. While in Chile there remains a central notion of ‘the state’ (the political system is not federal), there have been significant efforts to promote pro-entrepreneurship policies as well as special programs in some regions. Specifically, Amorós and Guerra (2009), using data from GEM and compared with other sources, show that indeed there has been an effort to decentralize some programs, primarily the creation of support mechanisms such as regional technology parks and business incubators.

Finally, in our study, a significant difference was found in terms of the perceptions about market dynamics. The results show that PEE perceive that their areas have more market dynamism than CEE. Basically PEE have higher evaluations related the

⁹ The events of the earthquake in Chile in February 2010 highlighted the differences that still exist in terms of physical infrastructure and telecommunications comparing the largest magnitude of the damage in the southern regions of the country versus the less damaged Santiago metropolitan region.

evolution of goods and services (consumer or business-to-business) which change from year to year. This finding can be explained in light of a different perception of relative-component in central versus regional markets. A small incremental change in central markets (for example, a new commercial district) could go unnoticed by many actors because this change does not represent a ‘dramatic’¹⁰ change. On the other hand, for many peripheral regions, any change in the markets dynamics could be critical for many actors included in the new and growing firms.

5 Conclusions

In this paper we revisit one of the most important debates about regional economic development: the important dimension of geography and how core versus peripheral regions inside a country differ in terms of economics activities, including entrepreneurship. According to the United Nations (2006), 36.4% of the urban population in Latin America lives in the main cities of each country, and Chile is no exception. Our findings that CEE have significantly better perceptions of finance support and physical infrastructure are an effect of this core-periphery spatial pattern. In Chile the traditional financial systems and equity funding mechanisms for new ventures are extremely centralized, and available funds do not tend to flow to profitable peripheral ventures (Romani et al. 2009). Consequently, the entrepreneurship experts from central regions have better perceptions regarding the availability of funding for entrepreneurs. On the other hand, while all experts in the country hold relatively favourable opinions about the national physical infrastructure (this EFCs was rated the highest, see Table 3), PEE put special emphasis on the missing services and infrastructure in peripheral regions that cause some gaps in terms of access to critical resources for entrepreneurs and new ventures.

These results related to finance and infrastructure should revive the debate about the need for specific regional government policies. The development of an entrepreneurial economy can help emerging economies achieve important economic growth (West et al. 2008),

in order to encourage those entrepreneurs located far away from core and metropolitan regions. In relation to financing, some authors stress the need for local (regional) capital markets as a means to reduce funding gaps (Klage and Martin 2005; Acs and Armington 2006). Others consider syndication and the formation of business angels’ networks as a substitute for spatial proximity (Fritsch and Mueller 2004). In both cases public policy could play a significant role in terms of the design of appropriate institutional and regulatory conditions to support entrepreneurship. In the case of Chile, during the past two decades several reforms have been implemented with a view to dismantle institutional barriers constraining equity funding, and many resources have been oriented towards public financing programs. The problem again is that the “critical mass” of entrepreneurs is located in central areas and they capture many of these financial resources. The Chilean government has not launched specific policies in favour of the country’s peripheral regions such as policies in other countries (Lerner 2009). Interestingly our findings show that although the country government does not prioritize peripheral entrepreneurship, the informants in the peripheral regions reported significantly higher perceived level of government policies and government programs in comparison to the core regions. This phenomenon may be due to higher impact and appreciation related to governmental acts in peripheral regions. Nowadays the Chilean government intends to strike equilibrium between central and peripheral regions since significant differences persist in terms of direct and indirect investments in basic services, access to communications and general infrastructures between core and peripheral regions. The Santiago metropolitan zone enjoys relatively ‘superior conditions’ in terms of total physical infrastructure, and the Valparaiso region maintains the dynamism in terms of seaports and logistics infrastructure. Moreover, the peripheral regions, by being located far away from the centre, make evident the need for more and better infrastructure just to ‘shorten’ this distance and thereby facilitate entrepreneurial activities. Consequently, it is very important to have public policy that promotes the decentralization of infrastructure investments.

Our findings seem to indicate better opportunities for central entrepreneurs to develop their business in terms of financial access and better infrastructure. On the other hand, very interesting significant differences were found in favour of peripheral regions on general

¹⁰ The survey asks the experts for their specific responses to the statement that “The markets for consumer (or business-to-business) goods and services change dramatically from year to year”.

government policies along with government programs as perceived by peripheral experts. Some local governments using ad-hoc mechanisms for specific regional context are trying to improve and provide enough support to entrepreneurs located in peripheral areas. These pro-entrepreneurship policies and programs have had important local outputs, such as working closer to the natural-resource based firms and trying to become aware of their potential to link with regional industrial clusters (CORFO 2007). These programs are designed to improve the local (regional) market dynamism, which was found to be another entrepreneurship condition that got better evaluation from PEE than CEE. With the inclusion of new firms that provide new products and services, peripheral areas can compete with their counterparts in the centre. Experience improving innovation and technology-based new firms could be relevant to enhance regional competitiveness (Storey and Tether 1998). According to the National Statistics Institute (INE 2010) the outcomes of regional economic growth also indicate a positive balance in favour of peripheral regions, for example 5.2% in Antofagasta or 2.1% in Araucanía. Using Chile's GEM data related to regional entrepreneurship activities dynamics (Amorós and Guerra 2009; Amorós et al. 2010), the average rate of opportunity-based entrepreneurship activities¹¹ (2007–2008) accounted for 9.9% of the adult population. In peripheral regions, the rate of opportunity entrepreneurship was 11.4%. These facts corroborate that opportunity entrepreneurship is higher in peripheral regions. Both approaches, the experts' opinions and the 2007–2009 rates of opportunity-based entrepreneurs, could indicate that governmental programs help to foster regional entrepreneurship. Thus, our results denote the requirement to put more emphasis on policy and programs that also can fill the missing financial services and infrastructure in peripheral

regions. In summary this study indicates that general policy and government programs can actually foster entrepreneurship in peripheral regions.

The advantage of the peripheral regions, which are less populated, can be explained by density dependence selection following the ecological theory (Hannan and Freeman 1977, 1989). Two processes are driven by population density: legitimation and competition. As legitimacy rises, founding rates accelerate and failure rates decelerate. Stronger competition is expected among geographically proximate firms resulting in higher rates of failure. Due to ecological theory, competition increases as the degree of overlap in resource requirements between organizations increases. Thus geographic concentration drives a distribution of new ventures as well as more opportunities in less dense regions.

This research contributes to the under-explored field of entrepreneurship in peripheral areas in Latin America through the case of Chile. Some limitations should be noted. Even though most of the experts interviewees were real entrepreneurs, were engaged in relevant industries sectors, and were selected strictly according to the NES GEM's methodology, the procedure was not random. This could cause some biases, but in many countries (and Chile is not the exception) there are not harmonized indices or measures from entrepreneurial framework conditions. By consequence, the key informants' expert information could describe "the unique situation of entrepreneurship within their own country" (Reynolds et al. 2005, p. 224). Additionally, as was previously described, the increase of experts year-by-year validate the feasibility of the EFCs constructs in the particular case of Chile and also is consistent with the rest of the countries that participate on the GEM project. It is important to remark that many of the interviewees came from the most important sectors inside the economic activity of the country and in its regions. For example, the agribusiness sector generates a high percentage of the job positions outside the metropolitan areas and of export to foreign markets with high levels of international competitiveness. In this respect, the information obtained by the NES is very relevant. The additional experts like academics and public policy officials working in higher education institutions and the public service sector added an important contribution to validate our findings. Further research is needed to generalize them, however. Increasing the number of the interviewed experts, and adding more regions would

¹¹ According to GEM methodology (Bosma and Levie 2010), opportunity-based entrepreneurs are those individuals involved in early-stage entrepreneurial activity (percentage of 18–64 population who are currently nascent entrepreneurs, i.e., actively involved in setting up a business or an owner-manager of a running business that has paid salaries, wages, or any other payments to the owners for not more than 42 months) who (i) claim to be driven by opportunity as opposed to finding no other option for work, and (ii) who indicate the main driver for being involved in this opportunity is being independent or increasing their income, rather than just maintaining their income.

help to increase the reliability of NES and the results. Additionally, it could be interesting to follow the experts' opinions using a longitudinal approach, such as a panel, in order to measure the differences over time. Expanding the cohort to additional countries, either elsewhere in Latin America or on other continents will corroborate the effects of different entrepreneurial framework conditions on peripheral and central regions around the world. The peripherality of countries can then be studied in terms of the global context.

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Appendix 1: Chilean geography and demography indicators



2009 population and economic indicators in Chile by selected regions

	Male	Female	Total	Regional GDP ^a	% National GDP
Peripheral					
Región de Arica y Parinacota	64,615	65,915	130,530	1,005,615	1.75
Región de Antofagasta	175,586	160,253	335,839	3,977,533	6.94
Región de Coquimbo	197,546	209,499	407,045	1,451,801	2.53
Región del Bío- Bío	617,054	657,319	1,274,373	5,586,218	9.74
Región de la Araucanía	284,412	298,792	583,204	1,548,006	2.70
Región de los Ríos	119,906	122,183	242,089	1,134,975	1.98
Total	1,459,119	1,513,961	2,973,080	14,704,148	25.65
Central					
Región de Valparaíso	519,991	566,009	1,086,000	4,993,682	8.71
Región Metropolitana	2,016,093	2,232,285	4,248,378	27,731,486	48.37
Total	2,536,084	2,798,294	5,334,378	32,725,168	57.08

^a Millions of Chilean pesos (2003 constant prices)

Appendix 2: Experts characteristics and numbers per region

Some examples of people that can act (or be adequate) as an expert in each EFC:

1. *Financing*: bankers, public managers of financial programs or subsidies, venture capitalists, business angels, entrepreneurs or business people in general.
2. *Policies*: public charges related to economics and enterprises environment, with taxes, development agencies or entrepreneurs subject to these policies.
3. *Programs*: public charges related to government programs, public agencies, business associations, development agencies, entrepreneurs and people to whom the programs are addressed.
4. *Education*: all types of professors/teachers (school, college, university, professional or vocational education), public charges related with education or entrepreneurs.
5. *R&D transfer*: personnel of industry, innovation, development and growth public or private agencies,

scientific parks personnel, university researchers, engineers, some types of entrepreneurs.

6. *Commercial and business services*: lawyers, accountants, advisors/consultants, economists, market analysts, survey vendors, entrepreneurs that need them, providers of them in general.
7. *Market openness*: market analysts, some researchers at universities or business schools, business associations, chambers of commerce, government agencies related to the economy and its development, entrepreneurs.
8. *Physical infrastructure*: all types of businesses and enterprises providers (gas, water, phone, electrics...), engineering, real estate, government agencies related to infrastructure, industrial parks, entrepreneurs.
9. *Cultural and social norms*: business associations, press, media in general, customers, providers, sociologists, entrepreneurs, foundations, trade unions.

Primary entrepreneurial framework condition specializations sub-samples by region.

Region	Financial support	Government policies	Government programs	Education and training	R&D transfer	Commercial and professional infrastructure	Market openness	Access to physical infrastructure	Cultural and social norms	Total
Antofagasta	16	14	15	17	17	15	15	14	16	139
Coquimbo	9	8	9	10	9	9	8	9	10	81
Valparaíso	9	7	11	11	11	28	21	7	6	111

Region	Financial support	Government policies	Government programs	Education and training	R&D transfer	Commercial and professional infrastructure	Market openness	Access to physical infrastructure	Cultural and social norms	Total
Bío- Bío	13	12	12	13	8	13	13	13	12	109
Araucanía	5	5	7	10	6	10	6	7	7	63
Metropolitana	12	10	8	12	13	14	11	9	11	100
De Los Ríos	3	4	3	4	3	4	3	3	4	31
Arica y Parinacota	5	7	7	8	7	8	6	5	8	61
Total	72	64	71	85	74	107	83	65	74	695

Appendix 3: Description of GEM entrepreneurial framework conditions and principal component analysis

This appendix contains a brief description of the nine different entrepreneurial framework conditions (EFCs) recognized by the GEM Consortium Research Committee (based on Bosma et al. 2008, p. 41; Bosma et al. 2009, p. 33). After each description there are the specific questions modified for regional approach for each of the EFCs that should be answered by a five-point Likert scale where 1 is “complete false” to 5 that is “complete true” and the principal component analyses results (communalities extraction, component matrix and total variance explained) for each EFC.

EFC1 Financial support: the availability of financial resources, equity, and debt, for new and growing firms including grants and subsidies.

Statement	Communalities extraction	Component matrix
In my region, there is sufficient equity funding available for new and growing firms	0.583	0.763
In my region, there is sufficient debt funding available for new and growing firms	0.537	0.733
In my region, there are sufficient government subsidies available for new and growing firms	0.429	0.655
In my region, there is sufficient funding available from private individuals (other than founders) for new and growing firms	0.436	0.660
In my region, there is sufficient venture capitalist funding available for new and growing firms	0.573	0.757
In my region, there is sufficient funding available through initial public offerings (IPOs) for new and growing firms	0.326	0.571

Total variance explained

Component	Initial eigenvalues			Extraction sums of squared loadings		
	Total	% of variance	Cumulative %	Total	% of variance	Cumulative %
1	2.883	48.051	48.051	2.883	48.051	48.051
2	1.007	16.778	64.829			
3	0.715	11.912	76.741			
4	0.554	9.231	85.973			
5	0.439	7.319	93.291			
6	0.403	6.709	100.000			

EFC2 Government policies: the extent to which government policies reflected in taxes or regulations or the application of both are either size-neutral or encourage new and growing firms. Subsequent empirical studies have shown that there are two distinct dimensions, or sub-divisions of this EFC. The first covers the extent to which new and growing firms are prioritized in government policy in general.

Statement	Communalities extraction	Component matrix
In my region, government policies (e.g. public procurement) consistently favour new firms	0.628	0.792
In my region, the support for new and growing firms is a high priority for policy at the local government level	0.751	0.867
In my region, the support for new and growing firms is a high priority for policy at the national government level	0.794	0.891

Total variance explained

Component	Initial eigenvalues			Extraction sums of squared loadings		
	Total	% of variance	Cumulative %	Total	% of variance	Cumulative %
1	2.173	72.423	72.423	2.173	72.423	72.423
2	0.529	17.641	90.064			
3	0.298	9.936	100.000			

The second refers to regulations for new and growing firms:

Statement	Communalities extraction	Component matrix
In my region, taxes and other government regulations are applied to new and growing firms in a predictable and consistent way	0.397	0.630
In my region, the amount of taxes is NOT a burden for new and growing firms	0.520	0.721
In my region, new firms can get most of the required permits and licenses in about a week	0.351	0.593
In my region, coping with government bureaucracy, regulations, and licensing requirements it is not unduly difficult for new and growing firms	0.566	0.752

Total variance explained

Component	Initial eigenvalues			Extraction sums of squared loadings		
	Total	% of variance	Cumulative %	Total	% of variance	Cumulative %
1	1.834	45.860	45.860	1.834	45.860	45.860
2	0.967	24.172	70.031			
3	0.645	16.119	86.150			
4	0.554	13.850	100.000			

EFC3 Government programs: the presence and quality of direct programs to assist new and growing firms at all levels of government (national, regional, municipal).

Statement	Communalities extraction	Component matrix
In my region, a wide range of government assistance for new and growing firms can be obtained through contact with a single agency	0.272	0.521
In my region, science parks and business incubators provide effective support for new and growing firms	0.309	0.556
In my region, there are an adequate number of government programs for new and growing businesses	0.508	0.712
In my region, the people working for government agencies are competent and effective in supporting new and growing firms	0.516	0.718
In my region, almost anyone who needs help from a government program for a new or growing business can find what they need	0.607	0.779
In my region, government programs aimed at supporting new and growing firms are effective	0.628	0.792

Total variance explained

Component	Initial eigenvalues			Extraction sums of squared loadings		
	Total	% of variance	Cumulative %	Total	% of variance	Cumulative %
1	2.839	47.309	47.309	2.839	47.309	47.309
2	0.855	14.252	61.561			
3	0.779	12.991	74.552			
4	0.605	10.086	84.638			
5	0.490	8.164	92.803			
6	0.432	7.197	100.000			

EFC4 Education and training: the extent to which training in creating or managing small, new, or growing business is incorporated within the educational and training system at all levels. There are two distinct sub-dimensions to this EFC: Primary and secondary school level entrepreneurship education and training:

Statement	Communalities extraction	Component matrix
In my region, teaching in primary and secondary education encourages creativity, self-sufficiency and personal initiative	0.687	0.829
In my region, teaching in primary and secondary education provides adequate instruction in market economic principles	0.746	0.864
In my region, teaching in primary and secondary education provides adequate attention to entrepreneurship and new firm creation	0.779	0.883

Total variance explained

Component	Initial eigenvalues			Extraction sums of squared loadings		
	Total	% of variance	Cumulative %	Total	% of variance	Cumulative %
1	2.211	73.704	73.704	2.211	73.704	73.704
2	0.460	15.332	89.036			
3	0.329	10.964	100.000			

The second dimension includes post-school (vocational-professional, college or university) entrepreneurship education and training:

Statement	Communalities extraction	Component matrix
In my region, the vocational, professional, and continuing education systems provide good and adequate preparation for starting up and growing new firms	0.676	0.822
In my region, colleges and universities provide good and adequate preparation for starting up and growing new firms	0.654	0.809
In my region, the level of business and management education provide good and adequate preparation for starting up and growing new firms	0.756	0.869

Total variance explained

Component	Initial eigenvalues			Extraction sums of squared loadings		
	Total	% of variance	Cumulative %	Total	% of variance	Cumulative %
1	2.086	69.538	69.538	2.086	69.538	69.538
2	0.532	17.739	87.277			
3	0.382	12.723	100.000			

EFC5 Research and development transfer: the extent to which national research and development will lead to new commercial opportunities and whether or not these are available for new, small and growing firms.

Statement	Communalities extraction	Component matrix
In my region, new technology, science, and other knowledge are efficiently transferred from universities and public research centers to new and growing firms	0.529	0.727
In my region, new and growing firms have just as much access to new research and technology as large, established firms	0.524	0.724
In my region, new and growing firms can afford the latest technology	0.449	0.670
In my region, there are adequate government subsidies for new and growing firms to acquire new technology	0.471	0.686
In my region, the science and technology base efficiently supports the creation of world-class new technology-based ventures in at least one area	0.408	0.639
In my region, there is good support available for engineers and scientists to have their ideas commercialized through new and growing firms	0.399	0.632

Total variance explained

Component	Initial eigenvalues			Extraction sums of squared loadings		
	Total	% of variance	Cumulative %	Total	% of variance	Cumulative %
1	2.779	46.319	46.319	2.779	46.319	46.319
2	0.960	16.000	62.319			
3	0.795	13.253	75.572			
4	0.565	9.422	84.995			
5	0.501	8.352	93.346			
6	0.399	6.654	100.000			

EFC6 Commercial, professional infrastructure: the presence of commercial, accounting, and other legal services and institutions that allow or promote the emergence of new, small, or growing businesses.

Statement	Communalities extraction	Component matrix
In my region, there are enough subcontractors, suppliers, and consultants to support new and growing firms	0.413	0.643
In my region, new and growing firms can afford the cost of using subcontractors, suppliers, and consultants	0.519	0.720
In my region, it is easy for new and growing firms to get good subcontractors, suppliers, and consultants	0.690	0.830

Statement	Communalities extraction	Component matrix
In my region, it is easy for new and growing firms to get good, professional legal and accounting services	0.667	0.817
In my region, it is easy for new and growing firms to get good banking services (checking accounts, foreign exchange transactions, letters of credit, and the like)	0.414	0.643

Total variance explained

Component	Initial eigenvalues			Extraction sums of squared loadings		
	Total	% of variance	Cumulative %	Total	% of variance	Cumulative %
1	2.703	54.051	54.051	2.703	54.051	54.051
2	0.852	17.050	71.100			
3	0.608	12.158	83.258			
4	0.514	10.275	93.533			
5	0.323	6.467	100.000			

EFC7 Internal market openness: The extent to which commercial arrangements undergo constant change and redeployment as new and growing firms compete and replace existing suppliers, subcontractors, and consultants. There are two distinct sub-dimensions to this EFC: market change or dynamisms, that is, the extent to which markets change dramatically from year to year:

Statement	Communalities extraction	Component matrix
In my region, the markets for consumer goods and services change dramatically from year to year	0.905	0.951
In my region, the markets for business-to-business goods and services change dramatically from year to year	0.905	0.951

Total variance explained

Component	Initial eigenvalues			Extraction sums of squared loadings		
	Total	% of variance	Cumulative %	Total	% of variance	Cumulative %
1	1.810	90.503	90.503	1.810	90.503	90.503
2	0.190	9.497	100.000			

The second is market openness, or the extent to which new firms are free to enter existing markets.

Statement	Communalities extraction	Component matrix
In my region, new and growing firms can easily enter new markets	0.660	0.813
In my region, the new and growing firms can afford the cost of market entry	0.710	0.843
In my region, new and growing firms can enter markets without being unfairly blocked by established firms	0.515	0.717

Total variance explained

Component	Initial eigenvalues			Extraction sums of squared loadings		
	Total	% of variance	Cumulative %	Total	% of variance	Cumulative %
1	1.885	62.848	62.848	1.885	62.848	62.848
2	0.674	22.475	85.323			
3	0.440	14.677	100.000			

EFC8 Access to physical infrastructure: Ease of access to available physical resources—communication, utilities, transportation, land or space—at a price that does not discriminate against new, small or growing firms.

Statement	Communalities extraction	Component matrix
In my region, the physical infrastructure (roads, utilities, communications, waste disposal) provides good support for new and growing firms	0.393	0.627
In my region, it is not too expensive for a new or growing firm to get good access to communications (phone, Internet, etc.)	0.591	0.769
In my region, a new or growing firm can get good access to communications (telephone, Internet, etc.) in about a week	0.603	0.776
In my region, new and growing firms can afford the cost of basic utilities (gas, water, electricity, sewer)	0.622	0.789
In my region, new or growing firms can get good access to utilities (gas, water, electricity, sewer) in about a month	0.452	0.672

Total variance explained

Component	Initial eigenvalues			Extraction sums of squared loadings		
	Total	% of variance	Cumulative %	Total	% of variance	Cumulative %
1	2.661	53.226	53.226	2.661	53.226	53.226
2	0.819	16.386	69.612			
3	0.648	12.965	82.577			
4	0.460	9.196	91.773			
5	0.411	8.227	100.000			

EFC9 Cultural, social norms: The extent to which existing social and cultural norms encourage, or do not discourage, individual actions that may lead to new ways of conducting business or economic activities and may, in turn, lead to greater dispersion in personal wealth and income.

Statement	Communalities extraction	Component matrix
In my region, the national culture is highly supportive of individual success achieved through own personal efforts	0.538	0.733
In my region, the national culture emphasizes self-sufficiency, autonomy, and personal initiative	0.725	0.851
In my region, the national culture encourages entrepreneurial risk-taking	0.700	0.837
In my region, the national culture encourages creativity and innovativeness	0.625	0.790
In my region, the national culture emphasizes the responsibility that the individual (rather than the collective) has in managing his or her own life	0.437	0.661

Total variance explained

Component	Initial eigenvalues			Extraction sums of squared loadings		
	Total	% of variance	Cumulative %	Total	% of variance	Cumulative %
1	3.024	60.486	60.486	3.024	60.486	60.486
2	0.721	14.417	74.902			
3	0.663	13.260	88.162			
4	0.309	6.171	94.333			
5	0.283	5.667	100.000			

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