

Entrepreneurship in the Rio Grande do Sul, Brazil: the determinants and consequences for the municipal development

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Abstract

This paper is about the links between entrepreneurship determinants, entrepreneurship rate and entrepreneurship consequences. We find strong evidence in the Rio Grande do Sul, Brazil, municipal data to support the view that institutional, economical, demographic and cultural variables shape entrepreneurship rate. Moreover support was also found for the fact that the entrepreneurship rate impacts the development of localities. Unlike other researches our results suggest that the entrepreneurship rate itself has no effects on the economic progress measured by the per capita income after controlling for the entrepreneurship determinants. Instead, we find that entrepreneurship rate has a positive impact on the human development levels of a local population measured by the Human Development Level.

Key words: Entrepreneurship, determinants and consequences, local development, Rio Grande do Sul

Resumo

Este artigo trata das relações entre a taxa de empreendedorismo, seus determinantes e consequências. Fortes evidências foram encontradas para os municípios do Rio Grande do Sul de que variáveis institucionais, econômicas, demográficas e culturais determinam a taxa de empreendedorismo. Além disso, encontramos suporte para a relação taxa de empreendedorismo e nível de desenvolvimento municipal. Porém, diferente de outras pesquisas, os resultados deste trabalho sugerem que a taxa de empreendedorismo não tem influência no desenvolvimento econômico dos municípios medidos pela renda per capita municipal. A relação somente é significativa antes de serem controlados os efeitos diretos dos determinantes do empreendedorismo na renda per capita, mostrando que o controle destes efeitos é vital para obterem-se resultados confiáveis. De outro lado, nós encontramos que a taxa de empreendedorismo impacta positivamente o nível de desenvolvimento humano dos municípios medidos pelo Índice de Desenvolvimento Humano.

Palavras chave: Empreendedorismo, determinantes e consequências, desenvolvimento local, Rio Grande do Sul

Área ANPEC: Área 5 - Crescimento, Desenvolvimento Econômico e Instituições

Classificação JEL do trabalho: O18 - Regional, Urban, and Rural Analyses

Introduction

Entrepreneurship is generally assumed to be an important aspect of the modern societies and therefore many people are interested in its understanding. Most of the interest is observed in the policy maker and academic communities. Policy makers in general are interested in promoting entrepreneurial activities for boosting economic development, while academics are focused on discovering the underlying mechanism which links entrepreneurship to development and to establish the theoretical base for the phenomenon. Although much has been investigated, there is a certain research rarity concerning the causes of the entrepreneurship and its consequences for the development due to conceptual and methodological limitations (Wennekers e Thurik, 1999; Van Stel et al., 2005). Both, entrepreneurship and development are complex phenomena, difficult for measuring and their concepts may vary in meaning according to the different theoretical milieus under consideration. As a consequence the progress of the theory and tests become a complex and difficult task.

The links between development and entrepreneurship have been proposed in the last century, mostly by Schumpeter (1934). For him, the development is result of innovative creation generated by entrepreneurs. Entrepreneurs are all those who are able of making good resources combination and take responsibility for the future of the business. Apart from Schumpeter, other authors also have emphasized the relationship between entrepreneurial activity and development, especially the economic progress (Barreto, 1989; Kircho, 1994; Van Stel and Storey, 2004, Audretsch and Keilbach, 2004). Researches were also elaborated to examine why countries and regions within a country differ in terms of entrepreneurial and development levels (Shane 1992; Pennings et al. 1998). Others have examined how different societies differ in terms of their entrepreneurial behavior based on their cultural values (see for example Adler, 1997; Kemelgor, 2002). Many others argue that the entrepreneurship and development is a more complex phenomena which is conditioned by cultural factors, but also by political, institutional and individual factors (Reynolds, 1991; Bygrave and Hofer, 1991; Hansemark, 1998; Baron, 2004)

In general, it has been observed an increased effort for incorporating the entrepreneurship as a central element for establishing public and private policies at developed and in development countries (Mytelka and Smith 2001; Todaro 2000; Porter et al. 2000; Rocha 2005). Researchers are constantly proposing new contends and ways of analyzing the links between entrepreneurship and development, but frameworks which empirically test the entrepreneurship determinants and consequences all together are still scarce. Our goal is to investigate the direct and indirect relations between entrepreneurship determinants, entrepreneurship rate and entrepreneurship consequences at the local level. This is in contrast to using separated analysis that produced equivocal results and led to a hiatus in the entrepreneurship research. To accomplish this goal we propose a model which explicitly links economic, demographic, institutional and cultural variables to the per capita stock of enterprises existents in a determined locality with its economical and human development levels.

The data were collected for 467 municipalities existent in the state of the Rio Grande do Sul, Brazil. This state has two distinct regions in terms of income level and development. The north region, which comprises circa of 80% of the municipalities and 50% of the total area is considered more developed and more dynamic. The south region located in the border of Uruguay and Argentina is considered less dynamic and poorer. Up to now many reasons were proposed as the cause of the disparity, but no study investigated the entrepreneurship as a possible cause of the disparity. Given this characteristic the Rio Grande do Sul's data seems to be appropriated to illustrate our framework.

In the sequel of this paper, we first present our model. In addition, we formulate a number of hypotheses that can be derived from our model and the literature. Subsequently, we present the procedures and data needed for testing our model and hypotheses. Finally, we describe and discuss the results from our empirical study.

Conceptual framework

In this section we present the conceptual model for analyzing the determinants and consequences of the entrepreneurship (Figure 1). The general argument can be summarized by stating that the local entrepreneurship is a multidimensional phenomenon determined by a vast type of factors (Rocha, 2005;

Sternberg e Wennekers, 2005). Firstly, we present the reasoning which give substance to the causes of the entrepreneurship. In this regard, our conceptual framework is based on economical, demographical, institutional and cultural variables. Secondly, we expect that the entrepreneurship level brings important consequences for the local population, such as more job opportunities, more income and better life conditions. Therefore, this section builds up the conceptual framework and elaborates the hypotheses that relate entrepreneurship to causes and consequences.

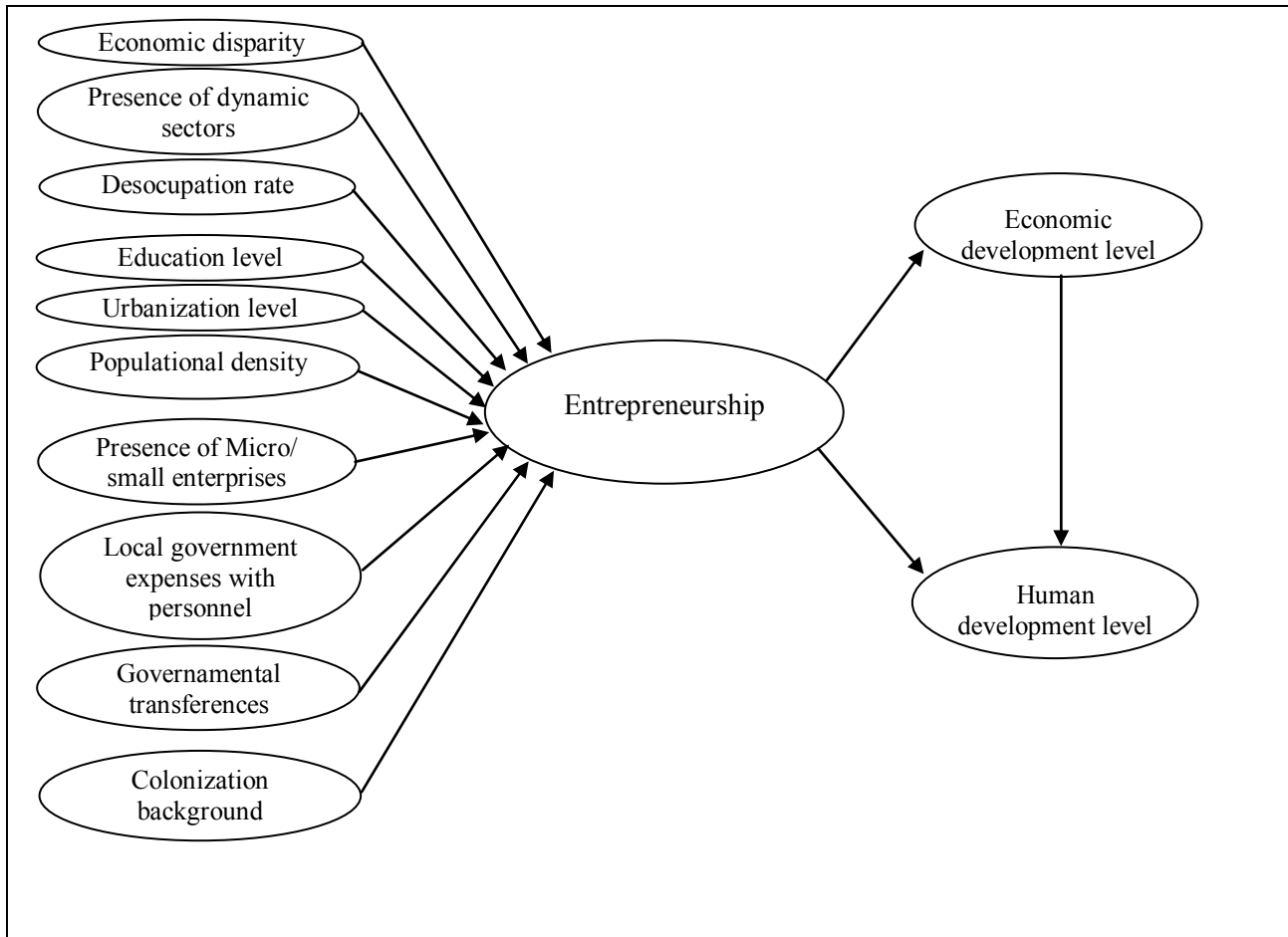


Figure 1 – The conceptual framework

The entrepreneurship determinants

Given the social and economical importance of the enterprises birth the entrepreneurship phenomenon has been studied extensively across wide-range of scientific domains including economics, sociology, anthropology, psychology, among others. In this study both economic and non-economic domains are selected to explain the level of entrepreneurship observed within a specific delimited area known by county. Counties constitute our unity of analysis and therefore the hypotheses will be elaborated framed on county's data.

Economic factors

Dynamic and active sectors are considered to promote external economies of scale available to other firms operating in the same geographical area. These external economies may be obtained by the resultant factors specialization, for instance, labor force, technology and infra-structure, which may facilitates the expansion of the entrepreneurship level (Rocha and Sterberg, 2005). To Porter (1990) beyond the role played by the external economies, the existence of active sectors in a region can strengthen the creation of firms by reducing uncertainties via reduced entrance and exit costs. Rocha (2005) states that economic sectors with long waves of effects backwards (towards suppliers) or forward (towards clients) tend to

facilitate the entrepreneurial activity, and Haddad (1999) points out the industry as having this characteristic. Therefore, we expect that localities where the industrial sector has a relevant role in the total gross product formation tend to increase the potential of start ups, both within and outside the industrial sector. Then, the first hypothesis states: *The greater the industrial participation in the formation of the regional gross product, the higher will be the entrepreneurship level.*

Situation of high *desocupation* encourages or even urges many people to start their own business as a mean of subsistence. An unoccupied/unemployed person is more willing to become self employed than an employed person (Hansemark, 1998). Then, firms creation is pushed by large supply of unemployed individuals (positive influence), but high unemployment may also pulls the entrepreneurship down because weak demand (negative influence) (Audretsch, 1993; Storey, 1991). Although the literature seems to be not definitive about the signal of the desocupation effect on entrepreneurship, we think that the positive effect prevails over the negative. Then, on the second hypothesis we state that: *The higher the desocupation rate of a population, the greater the entrepreneurship.*

It has been suggested in some studies (Ilmakunnas et al., 1999; Wennekers et al., 2005) that the rate of entrepreneurship is associated to the degree of *economic disparity*. Income inequality may pull or push self-employment by the very limited alternatives for those at the basis of the social pyramid. So, to make a better living, many individuals risk their saves as a way to survive. Income disparity is also likely to create a more differentiated demand for goods and services, which may push more birth of firms. Therefore, hypothesis three states that: *The greater the economic disparity, the higher the entrepreneurship.*

Demographic

The spatial distance among people may act as a restriction for the entrepreneurship. Contrarily, regions with high *population density*, i.e. low spatial distance among people are considered to facilitate the entrepreneurship due to better capabilities for the smoothly flow of knowledge (Ács e Varga, 2005). The type of knowledge most important for the entrepreneurial activity is the tacit knowledge, which is normally not yet coded and available for everyone. The tacit knowledge transmission is usually facilitated with the approximation between speaker (promoters) and listener (users), which can be persons or enterprises (Polanyi, 1967). Arenius e Minniti (2005) and (Reynolds, 2005) also call the attention for the fact that densely populated regions tend to facilitate the interactions among possible entrepreneurs, which otherwise would not have any chance to perceive business opportunities. Hence, we state in hypothesis four that: *The greater the population density of a locality, the higher is its entrepreneurial level.*

Urbanization has been widely accepted as having positive effects on entrepreneurship (Reynolds, et al., 1994; Acs and Storey, 2004). The role of urbanization on entrepreneurship is related to the increased demand for goods and services resultant in the urban areas. Hence, possible entrepreneurs are triggered to start a business given the perceived chance of making a living. Urbanization seems also to reduce the possibility of failure because the perception of possibly unsatisfied demand and the existence of a large number of clients around. Therefore, we state in hypothesis five that: *The higher the urbanization, the greater the level of entrepreneurship.*

Education is recognized as a key determinant of the entrepreneurial activity (Wennekers et al., 2002; Lee et al., 2004; Arenius and De Clercq, 2005). The education level affects the entrepreneurship in two ways: First, the education level influences the capability of citizens of perceiving opportunities and subsequently becoming an entrepreneur. That is, business opportunities are recognized by some individuals, but not by others based on knowledge differential (Arenius and De Clercq, 2005). Obviously, well educated people possess better information exchange capability and greater potential for intellectual elaboration (see similar argument on Cohen e Levinthal, 1990). Second, education is assumed to stimulate creativity and autonomy, which can raise the entrepreneurial spirit of a population. Therefore, the entrepreneurship level of a locality is positively influenced by the education level of its population, which needs recursive waves of investments for supporting the development trends or new development cycles. In this sense, we believe that the education is a variable which has a retarded effect in the entrepreneurship level. Hence, education investments made today can only boost the entrepreneurial

activity on the future. Then, on hypothesis six we state that: *The greater the past education level of a population, the higher will be its entrepreneurial level in the future.*

Institutional factors

In cross-national studies realized for comparing the variations in new firm formation rates in various countries presented in seven papers in a special issue of the *Regional Studies* in 1994, it was unanimously determined the importance of the *small establishments* for promoting the entrepreneurship (see the editorial overview provided by Reynolds et al., 1994). This, possibly, is associated to the learning process acquired by the new entrepreneurs in contact with the vast opportunities brought by the presence of small enterprises, resulting in lower risk perception and reduced entrance costs. Then, we expect that the proportion of *micro and small* firms leads to more firms births. Therefore, on hypothesis seven we state that: *The higher the proportion of micro to small enterprises, the greater the local entrepreneurial rate.*

From an economic perspective (Friedman, 1989; Mueller, 1995), governments and firms compete for the same resource basis. As bigger a government grows, higher will be its needs in terms of workers and other resources and consequently less available they will be to the private sector. Obviously, this reduces the incentives for the entrepreneurship as talented individuals may prefer to work in the less risky governmental jobs than as entrepreneurs. Therefore, we may well expect that the expansion of the public sector is detrimental to enterprise formation. Furthermore, the size of the government can also be linked to a suppressing activity exerted by higher regulations, which may desestimatate the entrepreneurial impetus of a society. On hypothesis eight we affirm that: *The bigger the local government, the lower will be the entrepreneurship.*

The *governmental transferences* are seen as fundamental policy for keeping and raising the society's welfare (Friedman, 1962; Buchanan et al., 1962; Sen, 1970). It functions as a buffering, which protects the population in times of scarcity, high unemployment, poverty or any other causes of social concern. However, even though the direct transferences function as a social protection for the local population, it brings negative effects to the entrepreneurship because people are not stimulated to invest and innovate. The uncertainties present in the business world may pay much less reward to the potential entrepreneur than to stay dependent on the guaranteed governmental assistance. Therefore, on hypothesis nine we state that: *The higher the governmental transferences to the local population, the lower will be the entrepreneurship level.*

Cultural factors

A relevant phenomenon in the cultural domain is the influence of *colonization background* over entrepreneurship. The colonization background manifests itself through the origins of the predominant population living in a determined region. The first colonizers that came to Rio Grande do Sul were Portuguese immigrants who occupied the South region known by "Pampas". These immigrants came to make a living in the imperial period based on large land title donation, which was exploited based on slavery force and extractively. Although most of the colonizers actually lived in the region they kept deep relation with their home land. Furthermore, the political and economical decisions were usually centralized in the hands of a few powerful land owners and rich aristocratic families. Other European immigrants mostly Italians and Germans came late, but occupied the most inaccessible areas i.e., the hilly and forested areas in the north part of the state. These colonizers started a new life based on small farm and family work force. Soon, this part of the state started to progress and increased its economical importance compared to the South part. We expect that over many decades of the 20th century, cultural background have favored the entrepreneurship in the north part of the state. Then, on hypothesis ten we state that: *The cultural background of the north part of the state favored the entrepreneurship.*

Entrepreneurship consequences

Entrepreneurship has been considered an endogenous promoter of the development (Morris, 1998; Porter 2000). Based on this condition we propose some hypotheses which link entrepreneurship to economic development and human development. Beyond that we test whether movements on the

entrepreneurship rate may cause changes on the human development indirectly, i.e., via changes on the economic development.

Entrepreneurship and the economic development

Entrepreneurship is considered a key factor to promote *economic progress* (Reynolds et al., 1994; Acs e Storey, 2004). A key argument is that the entrepreneur helps the economy because it transforms resources into products and services with added value. That is, the final added value is larger than the summed input values. Even when an entrepreneur is involved with products and services not entirely innovative, i. e., his/her products and services are already known, the entrance strengthen the regional economy because it can reduce costs and prices and stimulate quality and competitiveness (Disney et al., 2003). De Meza (2002), argues that when a entrepreneur fails his/her initiative can affect positively the economy first by saving others to invest in the same business, second by stimulating others to identify what has been wrong, and third by serving as learning process for future start ups. Although not all entrepreneurial initiatives extract innovative dividends to the economy, as higher the entrepreneurship initiative in a determined region greater will be the competition. Both, innovation and competition contributes for the continuous economy restructuring, which brings increases to the local income. Then, on hypothesis eleven we state that: *The higher the entrepreneurship rate of a locality, the greater will be the population economical development.*

Entrepreneurship and human development

According to Birch (1981) regions with greater amount of entrepreneurial activity tend to create more employment opportunities and consequently better social development. Late, others tested the association between entrepreneurship and social development and confirmed the positivity of the association mainly when the entrepreneurship activity is based on small to median enterprises (OECD, 1996; Reynolds et al., 2001). These researches, therefore, gave substance to the Schumpeter's ideas about development. For Schumpeter the development is endogenous and depends on changes induced by entrepreneurs. These empirical studies endorsed the relevant role of the entrepreneurial activity not only for promoting increases on the output of an economy, but also for promoting changes in the life standard of the population. Then, our hypothesis twelve we affirm that: *The higher the entrepreneurship activity in a locality, the higher will be its human development level.*

Economic development mediates the effects of the entrepreneurship on human development

The central idea of this hypothesis is that the effects of entrepreneurship on human development are mediated by various transformation processes engendered by the economic progress. Theorists as diverse as Reynolds et al. (1994) and Acs e Storey (2004) shared results of the importance of entrepreneurship for improving the level of the local income. Beyond the economical effects we expect that changes in the entrepreneurial activity will cause subsequently changes in the human development via increases/losses in the economic status. This is, there is a causal relation between entrepreneurship and human development mediated by the income level of a region. Therefore, we expect that entrepreneurship promotes economical gains, which in turn promotes social gains in the form of better salaries, better social infrastructures, etc. Hence, on hypothesis thirteen we state that: *The local economic development mediates the influences of entrepreneurship on the human development.*

Methodology

Data and procedures

We make use of the Brazilian Statistical Bureau (IBGE) and some other sources. In 2000 there were 496 counties in Rio Grande do Sul, but only 467 counties were considered in the analysis because the other 29 counties were created late on the 90's and the IBGE included their information in their respective mother's county. Furthermore one county (Triunfo) was considered outlier and not included in the analysis because it contradicts all trends observed on the entire data set. All data set were collected for the

year 2000, except a lagged indicator for education, which used data from 1991 and the county's expenses with personnel, which is an average for the ten years between 1991 and 2000. The rest of the data is based on 2000's data due to the lack of more recent data for the Human Development Index (HDI) estimated by the United Nations Development Programme (UNDP). Table 1 shows the variables used for testing the hypotheses, their units, how they were obtained and the transformation needed to normalize their distribution.

Our major dependent variable is entrepreneurship (ENTRE), which is defined as the per capita stock of enterprises in relation to the adult population (>25 years of age). Other dependent variables used in the model were the gross county income per capita (GPCPTA) as a proxy for the economic development and HDI for measuring the human development.

As the level of entrepreneurship in a region is determined by a wide range of variables we have selected a portfolio of determinants for testing our hypotheses. First, in economic terms we use the Gini index (GINI) for testing the income disparity hypothesis, the industrial gross product (INDGP) was used to test the influences of the industry on entrepreneurship, while the desocupation level (DESOCU) was used as a proxy for unemployment for testing the effects of the lack of employment opportunity on entrepreneurship.

Relevant demographic factors included in the analysis were the average number of years of school for the county's adult population (25 years or more of age) for 1991 (EDU91). The variable for 1991 was chosen because 10 years is an enough time span for the materialization of education investments into outcomes for the society. Furthermore, the data was available for the whole bench of counties, contrarily for other years. In addition to the 1991's average of years of school by the adult population, other demographic factors also may impact entrepreneurship. We used the urbanization (URBA) rate for measuring the influences of urbanization and the number of people per squared kilometer of area for density (DENSI).

Relevant institutional variables include the county's per capita expenses with personal payment (EXPPER), the percentage of the total population which receives 50% or more of their total income from direct transferences from the government (GOVTRANS). A third institutional variable is regarded with the participation of the micro and small enterprises (MICSMAL) on the total number of enterprises existent in each locality.

As the state of Rio Grande do Sul is formed by two distinct colonization regions (the north mostly colonized by Italians and Germans immigrants, while the south by Portuguese immigrants), we included a dummy (value 1 for South counties within the meso-regions Centro Ocidental, Centro Oriental, Sudeste Rio-grandense e Sudoeste Rio-grandense and value 0 for all other counties in the sample). The dummy (SOUTNOR) intends to measure the cultural impact over entrepreneurship.

Table 1 – Variables and calculations

Variables	Calculation	Unit	Transformation
ENTRE	County's number of enterprises / County population > 25 years of age	%	Square Root
GPCPTA	County gross product / County total population	¹ R\$1000,00/ inhabitant	-
HDI		0-1 (continuous)	-
GINI		0-1	-
INDGP	County's industry gross product / County's total gross product	%	Log
DESOCU	Total number of people ≥18 years of age - total number of people occupied ≥18 years of age / County population ≥ 18 years of age	%	-
EDU91	County's average number of years of school for the adult population in 1991 (≥ 25 years of age).	Years	-
URBA	County urban population / County total population	%	-
DENSI	County total population / County area	Inhabitants/ Km ²	Log
EXPPER	Average expenses with personnel (1991-2000) / average population (1991-2000)	R\$/Person	Square root
GOVTRANS	Number of people in the county receiving 50% or more of their income from the government / county total population	%	-
MICSMALL	County's number of enterprises with less than 50 employees / County's total number of enterprises	%	Log
SOUTNOR		1=South 0=North	-

¹ R\$ 1 = US\$.55

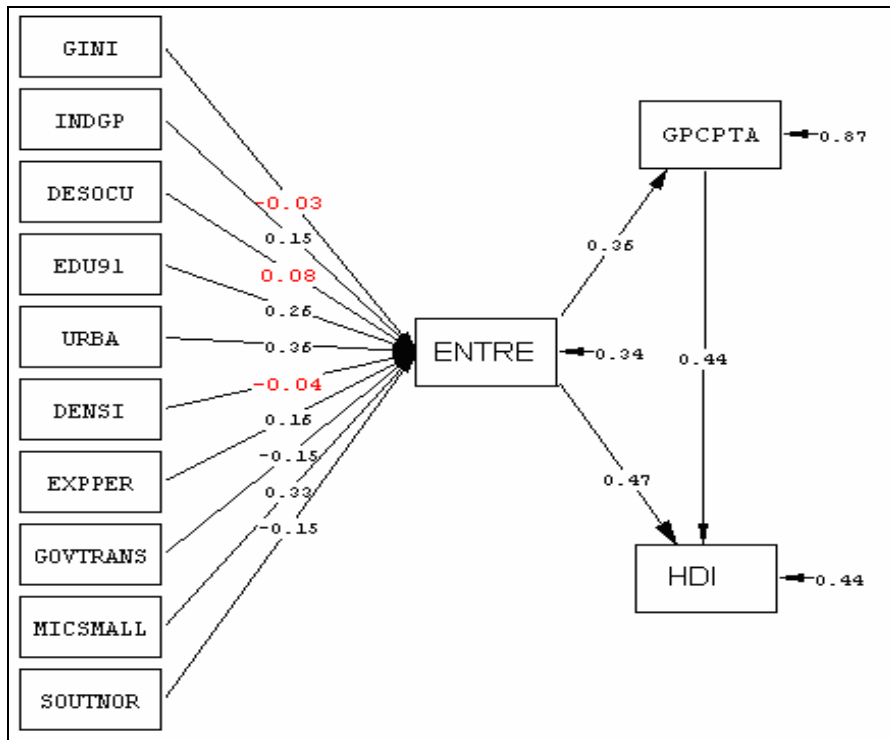
Method of analysis

Path analysis was used to estimate the relations between entrepreneurship determinants, entrepreneurship rate and entrepreneurship consequences. The analyses were performed with Lisrel 8.5 (Joreskog and Sorbom, 2001) based on the maximum likelihood estimation. The effects of variables on other variables can be denoted by their standardized regression (beta) coefficients or path coefficients. Path analysis allows the research to decompose the correlation between an exogenous and an endogenous variable, or between two endogenous variables, into the following components: (1) direct effect of one variable upon the other variable; (2) indirect effects via mediating variables; (3) unanalyzed effects due to correlated causes; and (4) spurious effects due to common causes. In this study, we are particularly interested in the causal part of the correlation coefficient, i. e., in the observed direct and indirect effects between variables.

Results

Assessment of Model Fit

Figure 2 shows the output for the original model; here we limit ourselves to a presentation of the paths linking the entrepreneurship to its determinants and consequences. Correlations between variables are displayed in Table 2. We also present the fit statistics and relevant diagnostic information for possible further modification to improve the model.



Notes: red parameters are not significant at $p = 0.05$
 Figure 2– The basic model

The first thing to note on the original model is its overall fit. For example, the Normal Theory Weighted Least Squares Chi-Square value comes to 359.62; with 20 degrees of freedom this yields a highly significant result ($p < 0.01$), implying that our model is not adequate. But, as caution should be taken because the chi-square test is very sensitive to sample size and departures from multivariate normality, other measures are considered to assess overall model fit. Among them, RMSEA = 0.193 is well above 0.1, indicating a high discrepancy between the implied covariance in the model and observed covariance in the data. The GFI and AGFI assess the correspondence between observed and hypothesized covariance. A good GFI should be 0.90 or higher, and a good AGFI should be near 0.90 or higher. In our model, GFI is 0.893, and AGFI is 0.515. The NFI indicates the extent to which the model improves fit compared to a random model, and a value greater than 0.80 is considered indicative of good fit. Our model has an NFI of 0.746 and therefore shows a bad fit. In general, all these results suggest that our model fits badly the data.

Table 2 – Correlation Matrix (466 observations)

	Mean	SD	1	2	3	4	5	6	7	8	9	10	11	12
1. HDI	.783	.036												
2. GPCPTA	7.127	3.300	.608**											
3. ENTRE	.064	.0241	.626**	.363**										
4. GINI	.520	.059	-.283**	-.308**	-.066									
5. INDGP	.190	.179	.508**	.458**	.531**	-.228**								
6. DESOCU	.608	.111	.046	.067	-.174**	-.501**	-.207**							
7. EDU91	4.239	.783	.742**	.425**	.675**	-.021	.569**	-.204**						
8. URBA	.511	.262	.448**	.272**	.648**	.163**	.673**	-.541**	.709**					
9. DENSI	83.380	304.691	.445**	.265**	.454**	-.287**	.562**	.089	.560**	.499**				
10. EXPPER	279.500	111.052	-.144**	.259**	-.017	-.144**	-.178*	.096	-.153*	-.218**	-.194**			
11. GOVTRANS	15.930	4.441	-.594**	-.556**	-.408**	.390**	-.358**	-.214**	-.340**	-.227**	-.323**	-.208**		
12. MICSMALL	.989	.008	.074	-.192**	.402**	.321**	.032	-.265**	.278**	.300**	.045	-.269**	.121**	
13. SOUTNOR	.149	.357	-.131**	-.122**	-.117*	.339**	.026	-.387**	.009	.152**	-.329**	.038	.201**	.100*

** Correlation is significant at the 0.01 level (2-tailed).

* Correlation is significant at the 0.05 level (2-tailed).

Improvement in fit is attained by the addition of model parameters or by eliminating non-significant variables. By looking at the modification index some suggestions are given, which can reduce considerably the size of the chi-square. It is suggested that adding direct paths from the entrepreneurship determinants to the entrepreneurship consequences the model will adjust to the data.

The first additional path is between EDU91 to GPCPTA and to HDI. The positive sign of these parameters make conceptual sense, since they imply that the human development and the per capita income in 2000 is likely to be greater in counties which the population had more years of school in 1991. Modification index also suggests adding paths from MICSMALL, INDGP, URBA and GOVTRANS to GPCPTA. Although it is difficult to know the signal of these relationship in advance, in an economical sense, it is quite obvious that the proportion of micro and small enterprises, the industrial gross product, the urbanization and the governmental transferences can have impacts on the county's per capita income level. In the same vein, it is reasonable to accept that GOVTRANS and URBA affect HDI, although their signals are also difficult to predict in advance.

While there are still a few large modification indices, none of them are as large as the ones for the original model. Moreover, they all relate to paths reflecting covariances among the exogenous variables, which cannot be substantively justified in the present case. Indeed, the modified model shows that while there has been a loss of 8 degrees of freedom, this has been more than compensated by the large reduction in the value of the chi-square statistic. The chi-square difference test (D2) is equal to 293.71, which is highly significant ($p < 0.001$) and shows that the added path contributed significantly for improving the model fit. The model overall and goodness of fit measurement indicates a reasonable fit of the model. The Normal Theory Weighted Least Squares Chi-Square value equals to 65.91, $df = 12$ and p -value < 0.001 , while $RMSEA = 0.099$, $NFI = 0.979$, $GFI = 0.979$ and $AGFI = 0.838$.

Inspection of the non-significant variables shows that GINI, DESOCU and DENSI are not relevant for predicting entrepreneurship. Additionally, as the correlation between EXPPER and ENTRE is close to zero and not significant, the significant path between these two variables raised concerns about potential multicollinearity in the data. Indeed the inclusion of EXPPER resulted in wrong signs and magnitudes of regression coefficient estimates, and consequently in incorrect conclusions about our hypotheses. Therefore, EXPPER and the other three variables were removed from further analysis. When these hypothesized precursors of the entrepreneurship are dropped down, the chi-square reduces to 4.74, and with 4 degrees of freedom the D2 difference test shows that the elimination of these four variables improves even better the model fit ($D2 = 53.64$, $p < 0.001$). Finally, the final model overall and goodness of fit measurement unanimously indicates an excellent fit of the model. The Normal Theory Weighted Least Squares Chi-Square value equals to 4.74, $df = 4$ and p -value = 0.315, while $RMSEA = 0.020$, $NFI = 0.998$, $GFI = 0.998$ and $AGFI = 0.975$.

Hypotheses tests

Table 3 presents results for the theoretical path model illustrated in Figure 1. Seven out of thirteen relationships were statistically significant at conventional levels ($p < 0.01$). Figure 3 illustrates the final model with the standardized parameter estimates for the final tested model.

Table 3 - Results of the hypothesis tests.

Hypothesis		Description of path	Standardized coefficient	T-value	Result
Economic determinants	H1	Presence of dynamic sector → Entrepreneurship	0.12*	2.63	Support
	H2	Desocupation rate → Entrepreneurship	0.05	1.21	Not
	H3	Economic disparity → Entrepreneurship	-0.05	-1.35	Not
Demographic determinants	H4	Population density → Entrepreneurship	-0.07	-1.65	Not
	H5	Urbanization → Entrepreneurship	0.35*	5.78	Support
	H6	Education level → Entrepreneurship	0.26*	5.95	Support
Institutional determinants	H7	Micro and small enterprises → Entrepreneurship	0.29*	9.25	Support
	H8	Local government expenses → Entrepreneurship	Removed		Not
	H9	Governmental transferences → entrepreneurship	-0.20*	-5.75	Support
Cultural determinants	H10	Colonization background → Entrepreneurship	-0.15*	-4.51	Support
Consequences	H11	Entrepreneurship → Income level	0.09	1.58	Not
	H12	Entrepreneurship → Human development	0.18*	5.03	Support
	H13	Entrepreneurship → Income level → Human development	0.02	1.54	Not

Notes: *p<0.01.

The first set of hypotheses (H1, H2, and H3) predicted the influence of economic factors on entrepreneurship. From Table 2, the economic determinant, presence of dynamic sector, has a positive effect on entrepreneurship (0.12, $p < 0.01$), and thus Hypothesis 1 receives support. There are, however, non-significant effects of economic disparity (-0.05, $p > 0.05$) and desocupation rate (0.05, $p > 0.05$) on entrepreneurship, and thus Hypotheses 2 and 3 are not supported. These findings suggest that the presence of the industrial sector is useful to Rio Grande do Sul municipalities to promote improvement in the entrepreneurial activity.

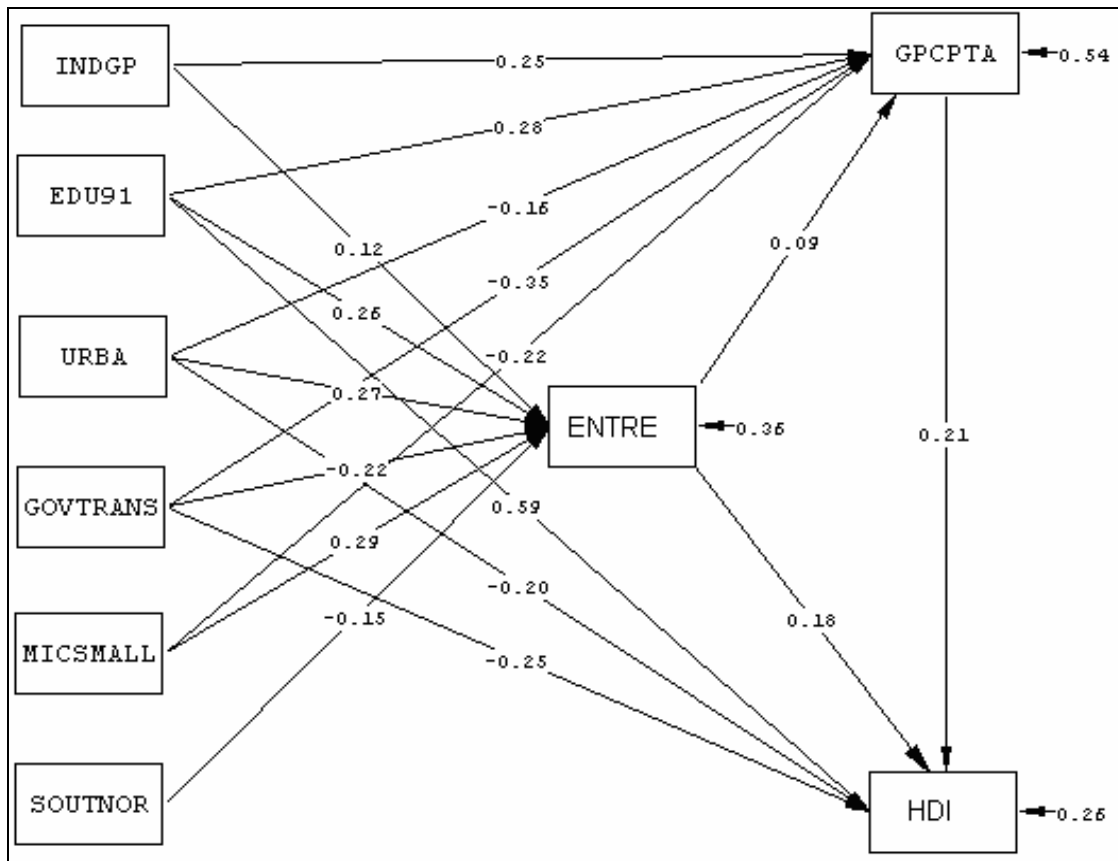
The second set of hypotheses (H3, H4, and H5) predicted the influence of demographic factors on entrepreneurship. Population density was not statistically significant related to entrepreneurship (-0.07, $p > 0.05$), and thus Hypothesis 3 is not supported. On the other hand, urbanization is positively related to entrepreneurship (0.35, $p < 0.01$), supporting Hypothesis 4. Hypothesis 5 also received support, because education level is shown to have a significant and positive effect on entrepreneurship (0.26, $p < 0.01$)

The third set of hypotheses (H7, H8, and H9) presented the relationship between the institutional factors and the entrepreneurship. Hypothesis 7 implied a positive effect of the micro and small establishments for promoting the entrepreneurship. Indeed, we found a significant and positive influence of the presence of micro and small enterprises on the municipal entrepreneurial activity (0.29, $p < 0.01$), which gives support for Hypothesis 7. The results also supported Hypothesis 9 (-0.20, $p < 0.01$), which confirms our reasoning that governmental direct transferences inhibit the entrepreneurship. Hypothesis 8 was rejected due to EXPPER and ENTRE shown not to be related.

Hypothesis 10 tries to capture the cultural impact on the entrepreneurship. There is a negative effect for the Southern counties dummy. This reflects that the inherited cultural background in the southernmost counties is less suitable for entrepreneurship (-0.15, $p < 0.01$).

The last set of hypotheses (H11, H12, and H13) predicted the influence of entrepreneurship on the economic and human development levels. First, entrepreneurship has not a significant influence on the

per capita income level (0.09, $p>0.05$), and thus Hypothesis 11 is not supported. It may reflect the lack of capability of the entrepreneurial activity *per se* for supporting economic development. Second, we found a positive effect of entrepreneurship on human development (0.18, $p<0.01$), which gives support for Hypothesis 12. So, counties with a relatively higher entrepreneurial rate promote better human development standards to the local population. Third, the per capita gross county product is found to not mediate the effects of the entrepreneurship rate on human development (0.02, $p>0.05$). Therefore, Hypothesis 13 is rejected. This result refutes the hypothesized indirect effect of the entrepreneurial activity on the life standard of a local population via increases on the per capita income level.



Notes: All paths are significant at $p < 0.001$, except the path from ENTRE to GCPTA.

Figure 3 – The final model

Discussion and conclusions

There are a number of insightful results reported by our study which suggests that economical, institutional, demographic and cultural variables shape the stock of enterprises per person existent in a locality. Furthermore, we were able to show that the stock of enterprise per person has positive consequences for the society in the form better human development index. Among its many dimensions, the main focus of the current paper has been the relations between entrepreneurship its causes and consequences. We introduced a rather stylized model which explicitly linked various variables to form the theoretical foundation for the analytical analysis. Such an analysis was carried out by resorting to Rio Grande do Sul data on a set of 466 municipalities.

The entrepreneurship determinants displayed in the Figure 3 can be linked to the productive structure (INDGP and MICSMALL), to the social structure (EDU91 e URBA) and to the government structure (GOVTRANS). Beyond that, the model contains a controlling variable for cultural differences. The benefit of using SOUTNOR resides on the possibility of controlling the coefficients for the other variables given that the used sample has different cultural characteristics.

The presence of micro and small enterprises and a strong industrial sector in a region act positively in promoting the entrepreneurship. It can be the case that external economies are generated which creates a positive societal environment for entrepreneurs formation, i.e., the external economies favor the

entrepreneurial capability. Young potential entrepreneurs may perceive in their neighborhood an active entrepreneurial activity and may find on it an example and a stimulus for engaging as entrepreneurs too. This phenomena gain even more emphases given that the entrepreneurial decision is not only result of individual traits (as for the old shumpeterian entrepreneur), but it depends on the productive structure where each individual is inserted.

The social structure is another fundamental factor for the understanding of the entrepreneurship. Generally, individuals who live in urban areas (Reynolds, et al., 1994; Acs and Storey, 2004) and which have better education tend to have higher entrepreneurial capability (Arenius and De Clercq, 2005). Indeed, urbanized regions offer better communication and logistic infra-structure, which facilitates the entrepreneurial activity. Educational investment increases the individual abilities for becoming an entrepreneur. The higher the regional educational level, higher is the human capital, i.e. the knowledge basis, for supporting high levels of entrepreneurship.

The governmental structure also affects the regional entrepreneurship. The government action in the form of direct transferences to the population, although generally intended to improve welfare, reduces the entrepreneurship impetus. In a situation where the income needed for living is guaranteed, individuals maximize their time on leisure activities, instead of entrepreneurial activities. In this perspective the government action is not neutral as has been suggested by many policy makers in Brazil and particularly in the Rio Grande do Sul. Therefore, if the objective is to boost development, it is necessary attention on the side effects caused by the government actions on the entrepreneurship.

Furthermore, an increase in the governmental transferences not necessarily improves welfare. Contrarily, the results obtained in this study show an inverse relationship between governmental transferences and HDI. Direct governmental transferences might be associated to political bargain and inefficient allocation, which helps to reproduce the initial poverty condition rather than alleviate it.

Unlike many earlier studies, the findings do not provide strong support for the view that entrepreneurship influence economic development. Instead, support is found for the hypothesis that the rate of entrepreneurship positively influences the degree of human development of a community. This is a key find of this study because we have shown that in fact the economic development is caused by the entrepreneurship determinants and not by entrepreneurship itself. This is illustrated in Figure 3, which shows a non-significant direct effect between ENTRE and GPCPTA, after the addition of paths from all entrepreneurship determinants to GPCTA, but SOUTNOR.

Therefore, we conclude that entrepreneurship is not able to influence the economic development per se, but rather it can have relevant effects for the human development. This result has important implications for establishing regional development policies because if the interest is to enhance economic development the best practice is to improve the entrepreneurship determinants rather than stimulate more people to start new business. The positive association between entrepreneurship rate and human development, on the other hand, indicates that policies set for improving the entrepreneurship impetus and the quality of the entrepreneurship may have significant impacts in the population welfare.

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