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The Role of Small Firms in Regional Growth; Evidence from Regional Data in Iran

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The Role of Small Firms in Regional Growth

INTRODUCTION



- ❖ Ever since Robert Solow (1956) based his model of economic growth on the neoclassical production function with its key factors of production, physical capital and unskilled labor, economists have relied upon the model of production function as a basis for explaining the determinants of economic growth.
- ❖ Romer's (1986) critique of the Solow approach was not with the basic model of the neoclassical production function, but rather with what Romer perceived to be omitted from that model was knowledge.
- ❖ Following with Romer, some economists like Lucas (1988) and others account knowledge, entrepreneurship and innovation as important factors of production.

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INTRODUCTION



- ❖ They believe because it was endogenously determined as a result of externalities and spillover, so it was particularly important.
- ❖ Entrepreneurship encourages innovative activity and puts a region at the forefront of economic growth.
- ❖ Regions that use entrepreneurial capital in a correct way, may be a winner in a competitive economic growth.
- ❖ Entrepreneurship has a central important role among the process that cause to regional economic change.

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INTRODUCTION



- ❖ So the benefits of entrepreneurship for regional welfare have, promoted much policy interest in how to favor entrepreneurship in the regional economy.
- ❖ This paper considered to entrepreneurship capital as an important factor in regional economic growth.
- ❖ In other word, the main purpose of our analysis is to provide empirical evidence on how and to what extend entrepreneurship capital contribute to regional economic growth in Iran.

The Role of Small Firms in Regional Growth
LITERATURE REVIEW



Authors	Country	Relation
Hart and Hanvey (1995)	UK	Link of new and small firms to employment generation
Callejon and Segarra (1999)	Spain	Link of new firm birth and death rate to TFP growth
Foelster (2000)	Sweden	Relationship between self employment and regional employment rates
Audretsch and Fritsch (2002)	Germany	Effect of start-up rates on regional growth rates
Holtz-Eakin and Kao (2003)	U.S	The impact of entrepreneurship on states growth

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LITERATURE REVIEW



Authors	Country	Relation
Audretsch and Keilbach (2004)	Germany	Link of entrepreneurship capital to German regions output
Mueller (2007)	Germany	The relationship between start up activity and regional economic growth
Chien and Hai (2008)	China	Link of knowledge capital to regional economic growth
Piergiovanni, Carree and Santarelli (2009)	Italy	effect of the increase in the number of firms active in regional economic growth
Cravo, Gourlay and Becker (2012)	Brazil	The importance of SMEs in Brazilian regional growth

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DATA



- ❖ Data type: regional
- ❖ Source of data: Iranian Statistical Center (ISC)
- ❖ Time period: 2001-2013

Variable definitions and sources

Variable	Variable Definition	Data Source
Y	Regional gross domestic production (without oil)	Iranian regional accounts
Y per cap	Regional gross domestic production per capita	Iranian regional accounts
IVA	Industrial value added in each region	Iranian regional accounts
K	Stock of physical capital used in small firms	Iranian statistical center
L	Total number of employees who work in small firms	Iranian statistical center
R&D	Number of the two most qualified labor categories who work in small firms	Iranian statistical center
Private Ent	Number of private small firms	Iranian statistical center
Governmental Ent	Number of governmental small firms	Iranian statistical center
Cooperative Ent	Number of cooperative small firms	Iranian statistical center
Official Ent	Number of official small firms	Iranian statistical center
Public Ent	Number of public small firms	Iranian statistical center
Total Ent	Total number of manufacturing small firms	Iranian statistical center

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MODEL SPECIFICATION



- A common approach to measure the impact of entrepreneurship capital on regional economic performance is on the basis of a production function of the Cobb-Douglas type.

Audretsch and Keilbach (2005)

$$Y_i = aK_i^{\beta_1} \cdot L_i^{\beta_2} \cdot R_i^{\beta_3} \cdot E_i^{\beta_4} \cdot \varepsilon_i$$

- By a logarithmic transformation, we have the following equation:

$$\ln(Y)_{it} = \ln(a) + \beta_1 \ln(K)_{it} + \beta_2 \ln(L)_{it} + \beta_3 \ln(R)_{it} + \beta_4 \ln(E)_{it} + \varepsilon_{it}$$

- ☞ A positive coefficient on physical capital (β_1) and labor force (β_2) is consistent with the neoclassical growth theory as asserted by Solow (1956).
- ☞ A positive coefficient on knowledge capital (β_3) and entrepreneurship capital (β_4) is consistent with the endogenous growth theory, as posited by Romer (1986) and Lucas (1988).

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EMPIRICAL RESULT



Table (4). Estimation results of empirical model (dependent variable: GDP per capita)

Variable	Model (1)		Model (2)		Model (3)		Model (4)	
	Coefficient	T-value	Coefficient	T-value	Coefficient	T-value	Coefficient	T-value
Constant	5.2837 ***	(4.1737)	7.8912 ***	(8.9647)	7.2461 ***	(6.8681)	9.0967 ***	(10.8274)
Ln(K) _t	0.6815 ***	(7.7711)	0.4420 ***	(11.2958)	0.4407 ***	(11.0967)	0.4144 ***	(6.9696)
Ln (L) _t	-0.3189 *	(-1.8478)	0.5837 ***	(4.7381)	0.4647 ***	(3.006)	0.6562 ***	(3.8700)
Ln (R&D) _t			0.6581 ***	(10.704)	0.6543 ***	(10.553)	0.6205 ***	(6.0216)
Ln (Pri ent) _t					-0.0830	(-1.4427)		
Ln (Gov ent) _t							0.2918 ***	(5.2592)
Chi ² stat for Hausman Test	14.2605 ***		26.0700 ***		29.7298 **		18.8347 ***	
Fixed effect	Yes		Yes		Yes		Yes	
R ²	0.6793		0.7352		0.7252		0.8293	
R ² _{adjusted}	0.6509		0.7056		0.6987		0.8068	
F-value	23.9241 ***		29.397 ***		27.1295 ***		36.8182 ***	
Observation	382		380		377		284	

The Role of Small Firms in Regional Growth

EMPIRICAL RESULT



Table (5). Estimation results of empirical model (dependent variable: GDP per capita) (continued)

Variable	Model (5)		Model (6)		Model (7)		Model (8)	
	Coefficient	T-value	Coefficient	T-value	Coefficient	T-value	Coefficient	T-value
Constant	7.9617 ***	(8.7695)	7.8992 ***	(8.1449)	11.149 ***	(10.1815)	3.7391 **	(2.0916)
Ln(K) _t	0.4576 ***	(12.315)	0.4421 ***	(11.2791)	0.4427 ***	(10.6097)	0.4320 ***	(11.0848)
Ln (L) _t	0.5869 ***	(4.5843)	0.5860 ***	(3.4899)	1.0147 ***	(7.1103)	0.5345	(1.2215)
Ln (R&D) _t	0.6756 ***	(11.564)	0.6580 ***	(10.6696)	0.7956 ***	(12.8860)	0.6518 ***	(10.6867)
Ln (Coop ent) _t	0.1173 **	(2.035)						
Ln (Offic ent) _t			0.0023	(0.01976)				
Ln (Pub ent) _t					-0.1218 **	(-2.5090)		
Ln (Total ent) _t							0.9634 ***	(2.6612)
Chi ² stat for Hausman Test	24.2979 ***		25.5337 ***		9.4032 ***		31.8398 ***	
Fixed effect	Yes		Yes		Yes		Yes	
R ²	0.7636		0.7305		0.8096		0.7360	
R ² _{adjusted}	0.7406		0.7048		0.7835		0.7107	
F-value	33.2819 ***		28.4241 ***		31.0929 ***		29.2205 ***	
Observation	374		380		256		380	

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Table (6). Estimation results of empirical model (dependent variable: Gross Domestic Production(without oil))

Variable	Model (1)		Model (2)		Model (3)		Model (4)	
	Coefficient	T-value	Coefficient	T-value	Coefficient	T-value	Coefficient	T-value
Constant	11.6830 ***	(11.827)	15.2823 ***	(16.531)	14.584 ***	(13.9314)	16.1129 ***	(17.7559)
Ln(K) _t	0.672 ***	(15.999)	0.4840 ***	(11.7767)	0.4734 ***	(11.3945)	0.4220 ***	(9.6347)
Ln (L) _t	-0.2006	(-1.4335)	0.6608 ***	(5.1068)	-0.5196 ***	(-3.3495)	0.6104 ***	(4.7638)
Ln (R&D) _t			0.6838 ***	(10.5913)	0.6825 ***	(10.5844)	0.6277 ***	(9.4210)
Ln (Pri cnt) _t					0.0899 *	(1.9751)		
Ln (Gov cnt) _t							0.3311 ***	(7.2208)
Chi ² stat for Hausman Test	11.049 ***		17.7338 ***		20.5291 ***		37.2684 ***	
Fixed effect	Yes		Yes		Yes		Yes	
R ²	0.7716		0.8270		0.8247		0.8931	
R ² _{adjusted}	0.7514		0.8110		0.8078		0.879	
F-value	38.1606 ***		51.8469 ***		48.9007 ***		63.3318 ***	
Observation	382		380		377		284	

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EMPIRICAL RESULT



Table (7). Estimation results of empirical model (dependent variable: Gross Domestic Production(without oil)) (continued)

Variable	Model (5)		Model (6)		Model (7)		Model (8)	
	Coefficient	T-value	Coefficient	T-value	Coefficient	T-value	Coefficient	T-value
Constant	15.4663 ***	(15.999)	15.2389 ***	(14.9612)	18.325 ***	(15.6993)	11.2866 ***	(6.0016)
Ln(K) _t	0.5009 ***	(12.662)	0.4840 ***	(11.7604)	0.5444 ***	(10.2153)	0.4744 ***	(11.5702)
Ln (L) _t	0.6874 ***	(5.0431)	0.6485 ***	(3.6778)	1.0268 ***	(6.7507)	0.4153	(0.9023)
Ln (R&D) _t	0.6916 ***	(11.118)	0.6842 ***	(10.5640)	0.8548 ***	(12.9889)	0.6778 ***	(10.5638)
Ln (Coop ent) _t	-0.0741	(-1.2076)						
Ln (Offic ent) _t			-0.0129	(-0.1022)				
Ln (Pub ent) _t					-0.1263 ***	(-2.4401)		
Ln (Total ent) _t							0.9271 ***	(2.4344)
Chi ² stat for Hausman Test	17.8969 ***		19.3229 ***		45.2595 ***		15.9993 ***	
Fixed effect	Yes		Yes		Yes		Yes	
R ²	0.8423		0.8270		0.88		0.8299	
R ² _{adjusted}	0.8270		0.8105		0.8636		0.8137	
F-value	55.0380 ***		50.1328 ***		53.6345 ***		51.1692 ***	
Observation	374		380		267		380	

Note 1: * $p < 0.10$, ** $p < 0.05$, *** $p < 0.01$.

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Table (8). Estimation results of empirical model (dependent variable: Industrial value added)

Variable	Model (1)		Model (2)		Model (3)		Model (4)	
	Coefficient	T-value	Coefficient	T-value	Coefficient	T-value	Coefficient	T-value
Constant	6.8657 ***	(8.8664)	10.8826 ***	(13.127)	10.120 ***	(17.7228)	12.3558 ***	(12.6498)
Ln(K) _t	0.6141 ***	(14.284)	0.4363 ***	(10.1094)	0.4239 ***	(9.7574)	0.3699 ***	(7.8462)
Ln (L) _t	0.1995 *	(1.8187)	-0.3182 ***	(-2.7788)	-0.1607	(-1.1418)	0.364 ***	(2.6398)
Ln (R&D) _t			0.6729 ***	(9.7502)	0.6681 ***	(9.7261)	0.6647 ***	(9.2677)
Ln (Pri ent) _t					0.1003 *	(1.6530)		
Ln (Gov ent) _t							0.3099 ***	(6.2795)
Chi ² stat for Hausman Test	3.9284		4.6752		5.0491		17.5765 ***	
Fixed effect	No		No		No		Yes	
R ²	0.4788		0.5811		0.5765		0.9159	
R ² _{adjusted}	0.4760		0.5778		0.5720		0.9048	
F-value	174.103 ***		173.8967 ***		126.632 ***		82.5695 ***	
Observation	382		380		377		284	

Note 1: * $p < 0.10$, ** $p < 0.05$, *** $p < 0.01$. Note 2: Model (1), (2) and (3) estimated by Random effect method.

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Table (9). Estimation results of empirical model (dependent variable: Industrial value added) (continued)

Variable	Model (5)		Model (6)		Model (7)		Model (8)	
	Coefficient	T-value	Coefficient	T-value	Coefficient	T-value	Coefficient	T-value
Constant	10.7702 ***	(12.799)	10.7166 ***	(11.2663)	14.641 ***	(11.2126)	7.4295 ***	(4.4675)
Ln(K) _t	0.4580 ***	(11.627)	0.4365 ***	(10.0936)	0.4414 ***	(8.8701)	0.4359 ***	(10.1529)
Ln (L) _t	-0.2895 **	(-2.4714)	-0.2702	(-1.5707)	0.8077 ***	(4.7469)	0.6696 *	(1.8507)
Ln (R&D) _t	0.6979 ***	(10.611)	0.6755 ***	(9.7375)	0.8060 ***	(10.9484)	0.6611 ***	(9.6024)
Ln (Coop ent) _t	0.1860 ***	(2.9919)						
Ln (Offic ent) _t			-0.0528	(-0.3910)				
Ln (Pub ent) _t					-0.0936	(-1.6166)		
Ln (Total ent) _t							0.9039 **	(2.3552)
Chi ² stat for Hausman Test	4.9103		4.6966		18.6244 ***		6.0226	
Fixed effect	No		No		Yes		No	
R ²	0.6097		0.5813		0.9027		0.5871	
R ² _{adjusted}	0.6055		0.5768		0.8894		0.5827	
F-value	144.128 ***		130.1808 ***		67.8481 ***		133.328 ***	
Observation	374		380		267		380	

Note 1: * $p < 0.10$, ** $p < 0.05$, *** $p < 0.01$. Note 2: Model (5), (6) and (8) estimated by Random effect method.

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CONCLUSION



- ❖ In this paper, we measure the entrepreneurship capital by the number of small firms with different types of legal status.
- ❖ Empirical results found that entrepreneurship capital exerts positive and significant impacts on regional GDP per capita, GDP (without oil) and industrial value added growth.
- ❖ our findings indicate that entrepreneurship capital plays an important role in the model of production function.
- ❖ The results suggest that in the case of Iran, government policies should direct to enhancement of entrepreneurship capital.



Thank you for your attention