Entrepreneurship and Economic Growth

Brussels 11/20/2009

Werner Bönte

Schumpeter School of Business and Economics
University of Wuppertal
Gaußstraße 20
42119 Wuppertal

Knowledge and Economic Growth

- Many countries invest large amounts of money in public R&D and/or provide support to private R&D

- In spite of such investments the growth rates are often moderate (sometimes called the *European Paradox*)

➡ investments in knowledge may be necessary but not sufficient to guarantee economic growth

➡ commercialization of knowledge is important

Is entrepreneurship the missing link?

Schumpeter School
of Business and Economics

Outline

1. Schumpeterian Entrepreneur
2. Theory and Empirical Results
3. IAREG Project – Entrepreneurship Capital
4. Entrepreneurship Policy

The Schumpeterian Entrepreneur

According to Schumpeter (1934) entrepreneurs are individuals who

". . . reform or revolutionize the pattern of production by exploiting an invention . . . or untried technical possibility for producing a new commodity or producing an old one in a new way . . . [This] requires aptitudes that are present in only a small fraction of the population . . ."

The Schumpeterian Entrepreneur

Schumpeter School of Business and Economics

According to Baumol (2004) the *Schumpeterian* entrepreneur…

- is the partner of the inventor
- is a businessperson who recognizes the value of the invention
- determines how to adapt it to the preferences of prospective users
- brings the invention to market and promotes its utilization
- is willing to bear the risk associated with starting up a business

The Schumpeterian Entrepreneur

The role of small and large firms:

"The major breakthroughs have tended to come from small new enterprises, while the invaluable incremental contributions that multiply capacity and speed, and increase reliability and user-friendliness have been the domain of the larger firms."

The relevance of entrepreneurs:

"It is widely believed that economies that are abundantly supplied with entrepreneurs will tend to grow far more rapidly than those in which entrepreneurial talent is scarce."

William J. Baumol (2004)

Theory and Empirical Results

Theory

- *Imitation, Entrepreneurship, and Long-Run Growth*,
  Schmitz, J.A., 1989, The Journal of Political Economy 97, 721-739

- *Low returns to R&D due to the lack of entrepreneurial skills*,
  Michelacci, C., 2003, The Economic Journal 113, 207-225

- *The knowledge spillover theory of entrepreneurship*,
  Acs Z., Braunerhjelm P., Audretsch D. B., Carlsson B., 2009, Small Business Economics 32, 15-30.

Theory and Empirical Results

The Knowledge Spillover Theory of Entrepreneurship

- *Knowledge spillovers* occur because knowledge exhibits, at least partly, characteristics and properties of a public good, i.e. it is non-excludable and non-rival in use (Arrow, 1962).

- If innovative firms cannot fully protect their proprietary knowledge, knowledge spillovers from incumbent firms will allow entrepreneurs to identify and exploit opportunities.

- The probability of a successful startup does not only depend on the given knowledge stock but also the average entrepreneurial ability in the economy (Acs et al., 2009).

Geographical Dimension of Knowledge Spillovers and Entrepreneurship

- Entrepreneurship is a *regional event* (Sternberg and Rocha, 2007). The results of empirical studies suggest that there are considerable regional differences with regard to the regional ability to stimulate entrepreneurial activities.

- Results of empirical studies point to *localized knowledge spillovers* (Audretsch and Feldman, 1996; Audretsch and Stephan, 1999; Jaffe et al., 1993).

Regional Entrepreneurship Capital (REC)

- Aggregate entrepreneurial activity of a region may be determined by a number of economic, social, legal or institutional factors, like

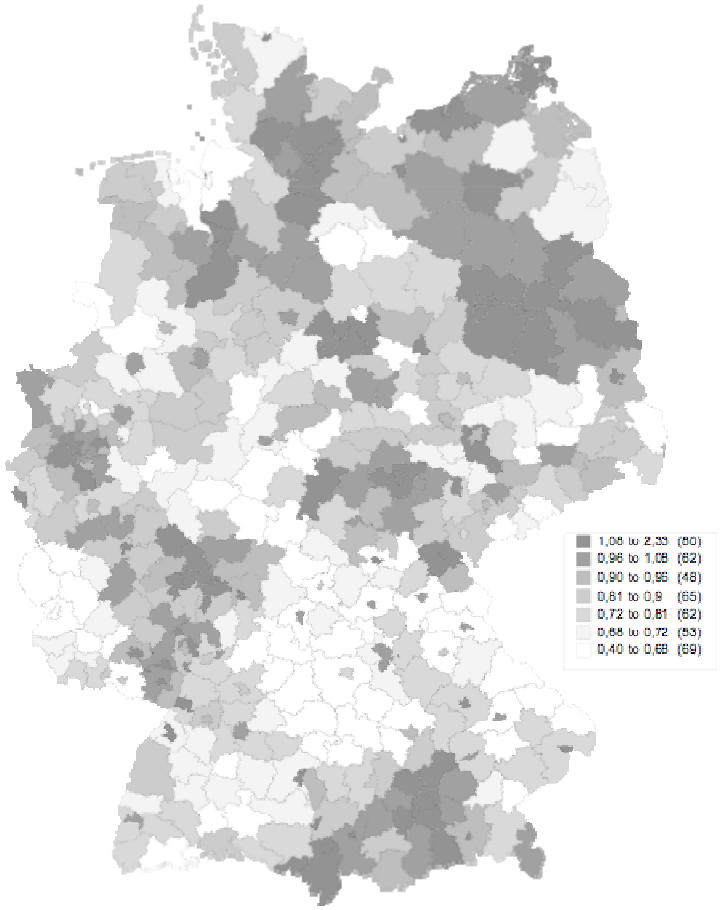
  - endowment with entrepreneurial ability
  - acceptance of entrepreneurial behavior
  - support by financial institutions
  - ….

- The regional milieu of agents and institutions that is conducive to the creation of new firms may be subsumed under the heading ***regional entrepreneurship capital***

(Audretsch/Keilbach, 2004)

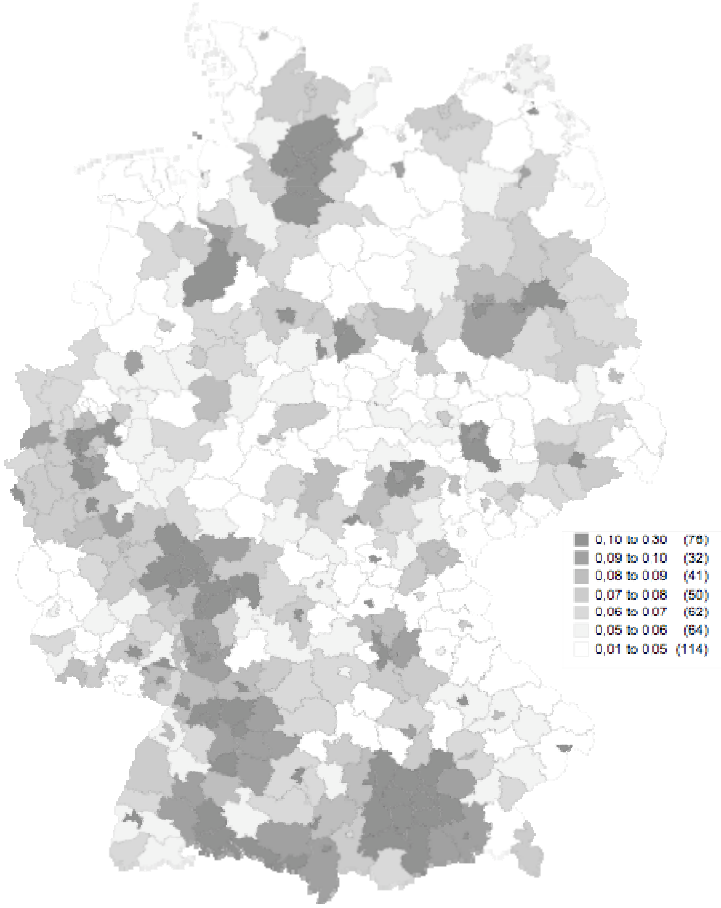
Theory and Empirical Results

Regional Startup-Intensity (1998-2000)



Schumpeter School of Business and Economics

Regional Startup-Intensity in „High-Tech“ Industries (1998-2000)



Theory and Empirical Results

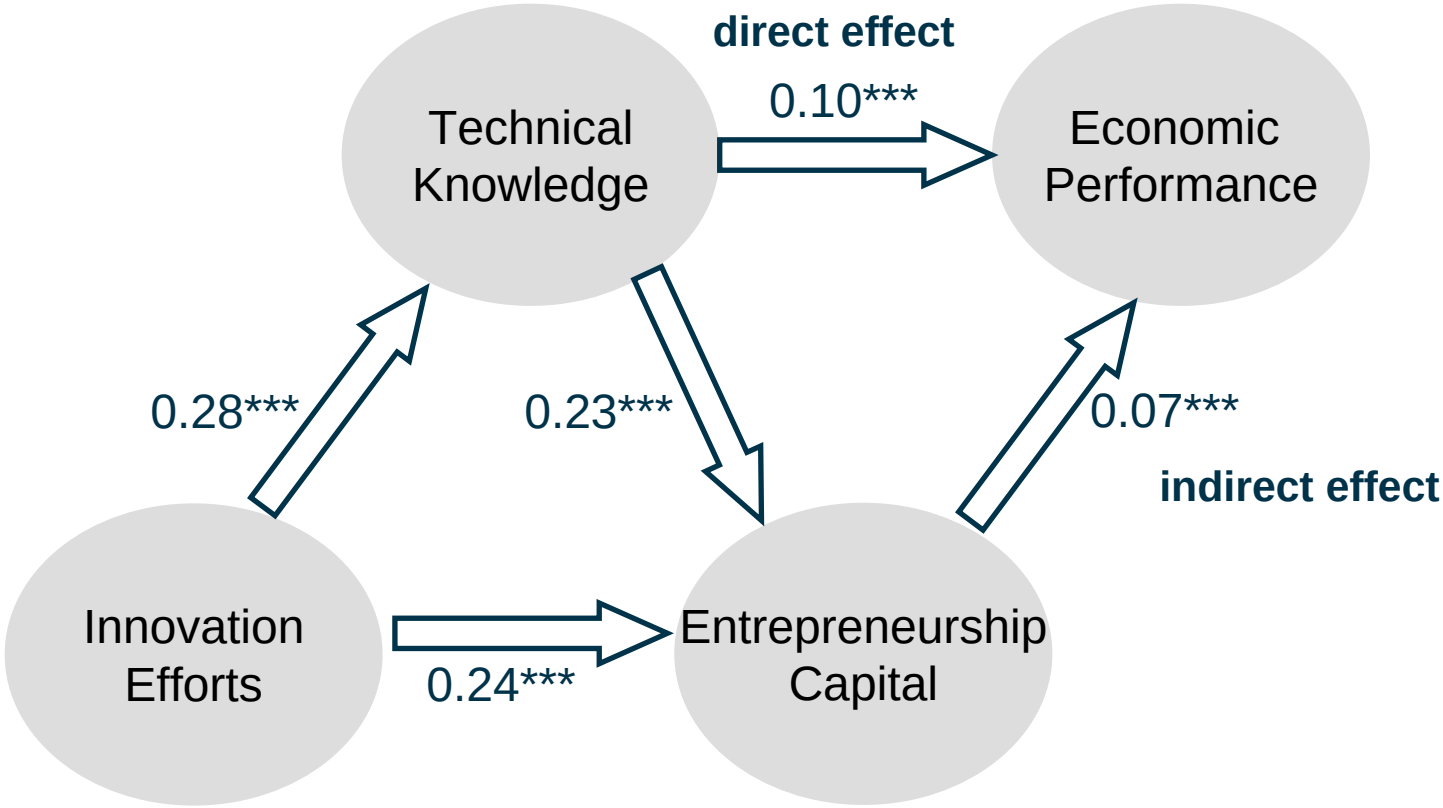
Regional Entrepreneurship Capital and its Impact on Knowledge Diffusion and Economic Performance

Audretsch, D.B., Bönte, W., Keilbach, M. *Journal of Business Venturing* 23, 2008, 678-698.

- Structural Equation Model (SEM) – Empirical analysis of the relationship between latent variables (theoretical constructs)
- *Direct* effect of technical knowledge (innovation efforts) on economic performance
- *Indirect* effect via the positive influence on entrepreneurship capital which in turn positively affects regional economic performance

Schumpeter School of Business and Economics

Theory and Empirical Results



- *Innovation Efforts:* R&D-intensity (years 1987. 1991, 1995)
- *Technical Knowledge:* patent-intensity (years 1995, 1996)
- *Economic Performance*: labor and capital productivity, manufacturing industries (year 2000)
- *Entrepreneurship Capital of a region*: startup-intensity in high-tech and ICT industries (years 1998-2000)

*** statistically significant at the one percent level

IAREG Project – Entrepreneurship Capital

Schumpeter School of Business and Economics

- **Intangible Assets and Regional Economic Growth** is a project financed by the European Union under the Seventh Framework Programme

- WP3: **Entrepreneurship capital and regional competitiveness** Max Planck Institute of Economics, Jena; DIW, Berlin

- Tasks (MPIoE): Measures of Entrepreneurship Capital; Relationship between Entrepreneurship Capital and Regional Productivity

Schumpeter School of Business and Economics

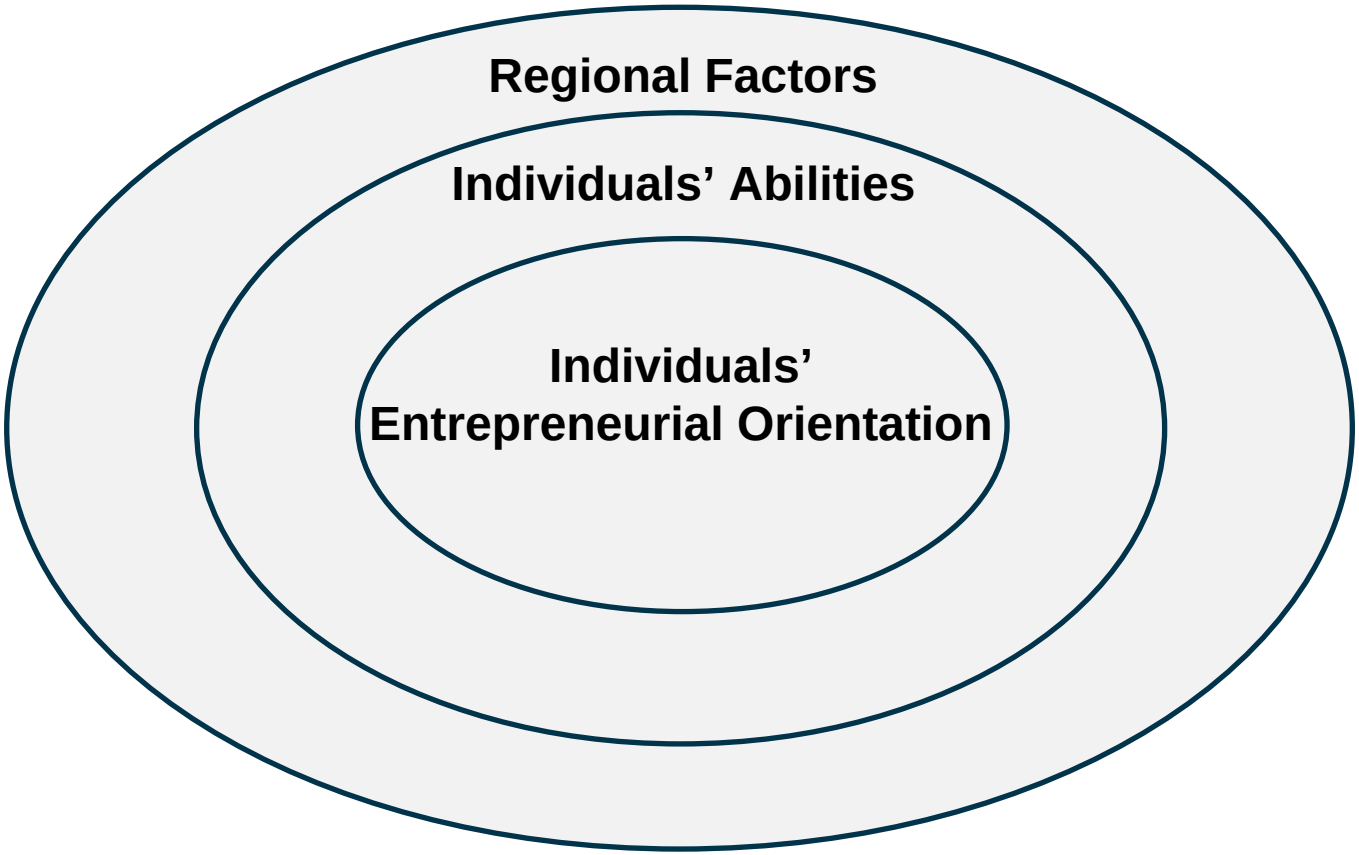
Measurement of Regional Entrepreneurship Capital

Definition of Regional Entrepreneurship Capital

- Narrow definition: the *entrepreneurial orientation* of all individuals in a region – proactiveness, autonomy, risk-taking, comp. aggressiveness, optimism, innovativeness
- Broader definition: *individuals' abilities* that may affect the decision to start a business (education, skills, network)
- Broadest definition: *regional factors* influencing an individual's decision to start a business (availability of resources to start a business, regulatory environment)

Schumpeter School of Business and Economics

Measurement of Regional Entrepreneurship Capital



Schumpeter School of Business and Economics

Measurement of Regional Entrepreneurship Capital

Regional Entrepreneurship Capital – a latent variable

- REC and especially entrepreneurial orientation of individuals in a region (narrow definition of REC) cannot be observed directly
- REC is a *latent variable*
- Indicators, like self-employment or start-up intensity, are used in empirical studies because of limited data availability

Schumpeter School of Business and Economics

Entrepreneurship Capital and Regional Productivity

Table 4: Total factor productivity regression – **growth rates** self-employment intensity and patent intensity

	growth rate TOTAL FACTOR PRODUKTIVITY (ln)					
	all regions		employment share in agriculture < 25%		employment share in agriculture < 10%	
	I	II	III	IV	V	VI
growth rate self-employment intensity (ln)	0.203*** (0.0672)	0.163** (0.0645)	0.093* (0.0649)	0.098 (0.0619	0.109** (0.0521)	0.1065** (0.0525)
growth rate patent intensity (ln)	---	0.131*** (0.0339)	---	0.128*** (0.0350)	---	0.0205 (0.0429)
R^2	0.0698	0.1725	0.0260	0.1277	0.0442	0.0466

Method: OLS Regression
Unbalanced panel time coverage: growth rate of a four year period from 2000-2003, Regions: Europe, NUTS 2
All regions:124 regions belonging to 18 countries; employment share in agriculture < 25%: 118 regions belonging to 17 countries; employment share in agriculture < 10%: 96 regions belonging to 14 countries
Robust standard errors in parenthesis
***significant at the 1 percent level; **significant at the 5 percent level; *significant at the 10 percent level under robust standard errors

Schumpeter School of Business and Economics

Conclusions

- There is some empirical evidence for a positive relationship between regional economic performance and entrepreneurship capital
- However, appropriate indicators for entrepreneurship capital are not available at the regional level:
  - Self-employment intensity is a crude measure
  - Regional start-up intensity in high-tech industries is a better measure (for analyses of the effects of *innovative* entrepreneurship)

Schumpeter School of Business and Economics

Conclusions

In order to measure Regional Entrepreneurship Capital (REC), we need

- Representative data at the regional level
- Better indicators for individuals' entrepreneurial orientation

Entrepreneurship Policy

- Policy measures aiming to increase the *total* number of businesses may be inappropriate to foster economic growth.

- Shane (2009) states that the "typical start-up is not innovative, creates few jobs and generates little wealth".

- ***Existence of market failures*** is the main justification for the implementation of entrepreneurship policies (for instance, due to asymmetric information and incomplete appropriability)

- "Particularly for entrepreneurs without an established reputation, convincing external resource providers such as venture capitalists (VCs) to provide financial capital may be challenging." (David Hsu, 2004)

Entrepreneurship Policy

- There are three important elements that have to be considered when entrepreneurship policy programs are issued: ***program design***, ***control of success*** and ***scientific evaluation***.

- ***Program design*** concerns three questions: Who is supported by the program? How is the money distributed? What is the time horizon of a program?

- ***Control of success****:* it is important that program targets are clearly defined and that state-of-the-art evaluation methods are used in order to scrutinize the success of a program.

- ***Scientific evaluation*** should be independent, transparent and comprehensible. Moreover, the evaluation results should be published.