Determinants of birth and mortality of entrepreneurial firms in OECD economies

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Gaps in the existing literature

- Existing literature:
  - (a) psychological and demographic determinants of ent. propensity
  - (b) impact of entrepreneurial activity/propensity on eco. growth/ devt.
- Explicit attention to factors that influence economy-wide entrepreneurial performance (e.g., birth, survival, growth and mortality)
- Variation of the salience of a factor across the life cycle of a firm

This research

- Analyzes internationally comparable data developed by the World Bank, Eurostat and other international organizations.
- Explanatory variables: country-level data on economic and institutional factors (e.g., regulatory framework, macroeconomic conditions, access to finance, and market conditions.
- Dependent variables: country-level-- birth and mortality rates.

Firm Births

- Reynolds et al.(1994): demand, urbanization/agglomeration, small firm presence, unemployment, personal household wealth, local political ethos and government spending/policies.
- Capital requirements, labor market regulations, regulatory costs, and the availability of financing sources (Ho &Wong, 2007; Van Stel et al., 2007).
- Choi and Phan (2006) :proactive government policies in the areas of R&D investments, patents, economic concentration, pro-competition policy, and labor mobility.

Firm Births (contd.)

- Low growth rates, low interest rates and high unemployment rates (Audretsch and Acs, 1994; Highfield and Smiley, 1987).
- Lee et al. (2004): soc. diversity , creativity, human cap. avail., inc. growth, pop. growth.
- Brixy and Grotz (2007): a high level of agglomeration, change in employment, avail. of highly qualified workers--positive effect,
  - unemployment rate --no influence
  - changes in the unemployment rate--negative effect.

Availability of capital

- A major predictor of business start-ups (Pennings, 1982).
- Size of wealth and asset; sufficiency and size of initial financial resources --growth and survival rates of new firms (Bamford, Dean and Douglas, 2004; Kauermann, Tutz and Bruderl, 2005).
- Experimentation with new innovative projects and strategies (Cooper et al.1994).
- Ability of firms to enter new market segments/compete with incumbents(Ho and Wong, 2007).
- Availability of capital-- lower borrowing costs.
- Fogel's (2001): Hungarian entrepreneurial firms, 42 percent reported a need for low-cost, long-term loans, and 22 percent desired a need for VC financing.

Labor productivity

- Labor productivity-entrep. nexus--less clear when entrepreneurs compared with the general pop.
- Disney et al.(2003): average annual labor productivity of entrants--2.4% higher than for incumbent firms, 5% higher than for exiting firms.
- Majority of the lit.-- entrepreneurs have no higher labor productivity than non-entrepreneurs (Van Praag & Versloot, 2007).
- Brouwer et al. (2005): entrepreneurs have lower labor productivity levels than their non-entrepreneur counterparts.
- Foster et al. (2006): exiting establishments were less productive than entering establishments.
  - entering and incumbents had similar productivity levels.

Employment/Unemployment

- New firm formation--role of unemployment (Storey, 1991; Evans and Leighton, 1990).
- Emphasis on unemployment -- 1990's and the early 2000's;
  - role of technology and the internet.
- Rate/changes in unemployment—stimulate/hinder new firm formation (Keeble and Walker, 1994; Storey, 1991).
- unemployment --unfavorable labor market-- low opp. costs due to lack of alternative options (Brixy & Grotz, 2007).
  - self-employment -- "entrepreneurs of need" (Carree, 2002).
- Highfield &Smiley (1987): low eco. growth , low interest and high unemployment --increase in firm entry.
- Unemployment--decrease in disposable income, (Armington and Acs, 2002; Reynolds et al., 1994).

Corruption

- Porter (1980)-- tighter government regulation--- barriers to entry.
- Corruption--abuse of public power/authority for private gain.
  - discourages entrepreneurship, reducing businesses' and citizens' trust in state institutions and increasing the expenses of businesses (Carasciuc, 2005; Gray et al., 1997; Ivy, 1997; Kiggundu, 2002; Stevenson, 1998).
- Control of corruption--trust in govt. institutions-- encourage entrep. activities (Rose-Ackerman, 2001).
  - Anokhin and Schulze (2009) --positive relationship between control of corruption and levels of entrep. Activity/innovation across nations.
- Ex-Czech Premier Mirek Topolanek: reducing corruption through less government interference and control.
  - minimize govt. regulation, simplify legislation, and reduce the bureaucracy (Bautzová, 2008).

Major hypotheses concerning the determinants of firm birth

- the availability of sources of funding (+)
- a positive change in the level of labor productivity (+)
- a positive change in the unemployment rate (+)
- a positive change in the level of corruption (-).

Mortality of Firms

- Determinants of death/mortality-- three broad groups of factors:
  - micro-level factors relating to the individual entrepreneur or business owner-manager;
  - firm-specific structural factors;
  - economic and institutional factors..

Mortality of Firms (Contd.)

- Firm-specific structural factors--age, size, industry affiliation and lack of firm specific assets/resources.
- Age-- "liability of newness"
  - Young firms lack a repertoire of explicit processes and routines to build up resources, tacit knowledge and organizational capabilities.
- Size-- "liability of smallness" (Box, 2008).
  - Disadvantaged-- opportunities relating to access to financial resources, knowledge bases, skills and expertise (Rogers, 2004).
- Sector:
  - manufacturing and/or innovative or highly competitive industries--likely to exhibit higher growth, also more likely to face higher risks of mortality (e.g., Audretsch and Mahmood, 1995; Wagner, 1994).

Mortality of Firms (Contd.)

- Economic and institutional --determinants of the death/mortality of entrepreneurial firms.
- Audretsch (2003)--macroeconomic /institutional factors have received less attention in ent. research.
- Davidsson and Henrekson (2002): much of the empirical research --on individual and firm-level factors "while taking the broader institutional framework ('the rules of the game') ..the aggregate outcome as given".
- Box (2008): interaction of firm-specific structural factors (e.g., size) and macroeconomic and institutional factors explain differences in death rates in different firm populations.
- This paper:
  - macroeconomic/institutional variables (e.g., economic growth, taxation, bureaucracy, unemployment rate, and labor productivity).

Financial capital

- Financial resources--entrepreneurial firm survival and lack of it.
- Financial capital is the most general type of resource than can be converted to other types of resources.
  - undeveloped financial markets, higher lending rates or tighter credit constraints could impede the expansion plans/survivability.
- Essential for strategic activities -- growth and survival (Schafer and Talavera, 2009).
- Everett and Watson (1998)-- small business failure--- lack of appropriate managerial skills and inadequate financial capital -- start-up and on a continual basis.
- Box (2008)--High lending rates may reduce investments -- increase debt burden, difficult to easily access financial capital.

Unemployment

- An increase in unemployment rate --decrease in disposable income
  - affect sales and performance of entrepreneurial firms, thereby increasing their probability of failure.
- Audretsch and Mahmood (1995): unemployment rate-- positive influence on the mortality
- Everett and Watson (1998): an increase in unemployment rate--positive effect on the failure of small businesses.

Economic growth

- Decrease in demand would affect all businesses, but new entrepreneurial firms would feel the impact disproportionately.
- Falck (2007) --economic growth increased the survival chances of new businesses while minimizing their chances of failure.
- Box (2008): macroeconomic expansion-- the risk of entrepreneurial firm mortality decreases.
- An increase on the failure rates of business establishments' during macroeconomic downturn, and fall during economic growth (Hudson, 1986; Robson, 1996).

Business Taxes

- lower corporate tax rates facilitate entrepreneurship (Chen et al., 2002; Fogel, 2001).
- Entrepreneurial activities increase if tax incentives are provided (*Carroll et al., 2000a, b;* Fogel, 2001).
- Fogel's (2001) survey of Hungarian entrepreneurial firms, 48 percent of the respondents expressed a need for more tax incentives.
- Higher tax rates--increase the self-employment rate , reduces the possibility of leaving self-employment (Bruce, 2000; Chen et al., 2002).
- OECD countries-- provisions for carrying losses backward and forward.
  - Australia, Austria, Belgium, Germany, Ireland, Luxembourg, NZ, Sweden and UK-- carry forward losses indefinitely and apply to future profits (Chen et al.).
- Keeble and Walker (1994) --a higher local authority taxes in the UK burdens new business and increases deregistrations (the business failed or relocated).
- Compliance and administration costs--1.5% of GDP in the U.K. in 1986 (Sandford et al., 1989) and at 3% of GDP in NZ in 2000 (Dalsgaard, 2001).

Labor Productivity

- Exiting establishments-- less productive than entering establishments (Foster et al, 2006).
  - determinant of relative efficiency and probability of increasing economic growth, consumption and aggregate demand.
- The resulting economic expansion and increase in consumption
  - facilitate the survival of entrepreneurial firms.
- As the labor productivity increases, mortality decreases.

Corruption

- Corruption--reduces businesses' and citizens' trust in state institutions and increases expenses of businesses (e.g., Carasciuc, 2005; Kiggundu, 2002, Pope, 2001).
- Deficiencies in a nation's institutional environment—high agency and transactions costs for firms, limiting revenues and eroding profitability.
- Increased risks and excessive cost of doing business.

Concluding hypothesized relationships

Determinants of firm mortality:

- the availability of easy access to financial capital (+)
- a positive change in unemployment (+)
- a positive change in labor productivity (-)
- a positive change in the taxes on businesses (+)
- a high level of economic growth (-)
- a positive change in the level of corruption (+)

Method

Data and Measures.

Dependent variables

- *Birth Rate (BR):* the ratio of total number of births in a year to the number of enterprises with one employer or more (i.e., when turnover is greater than zero).
  - A firm birth is considered to have taken place when employees and turnover are both greater than zero for the first time (Ahmad, 2006).
- *Death Rate (DR):* the ratio of the total number of deaths in a year to the number of enterprises with one employer or more (i.e., when turnover is greater than zero).
  - A firm death is considered to have taken place when a firm with more than one employee in calendar year *t* has less than one employee in calendar years *t+1* and *t+2* (Ahmad, 2006).

Method

Data and Measures.

Independent Variables

- *Change in Annual Lending Rates (Δ* ALR)
- *Changes in Labor Productivity (Δ* PTY)
- *Changes in the Market Capitalization per Capita (Δ* MCPC).
- *Changes in the Corruption Perception Index Score (Δ CPIS).*
- *Changes in the Unemployment Rate (Δ UR)*
- *Changes in Taxes and Social Security Contributions (Δ TSSC).*
- *Real Gross Domestic Product Growth (RGDPG)*

Statistical Analysis

$$BR_{it} = \beta_{1it} + \sum_{k=2}^{K} \beta_{kit} x_{kit} + \varepsilon_{it} \qquad (1a),$$

$$DR_{it} = \beta_{1it} + \sum_{k=2}^{K} \beta_{kit} x_{kit} + \varepsilon_{it} \qquad (1b),$$

Descriptive Stat. for variables used in the model with BR as DV (N =40)

	Minimum	Maximum	Mean	Std. Deviation
BR	.05	.18	.105	.036
ΔMCPK	-20.02	38.95	-.32	8.60
ΔUR	-1.80	.90	-.33	.61
ΔCPIS	-2.60	5.20	.08	.96
ΔPTY	-7033.20	8896.20	415.59	3600.56
ΔALR	-11.40	13.90	-.69	3.92

Descriptive Stat. for variables used in the model with DR as DV (N =28)

	Minimum	Maximum	Mean	Std. Deviation
DR	.06	.15	.091	.0249
ΔTSSC	-1092.30	713.40	-141.88	446.88
ΔCPIS	-.60	5.20	.36	1.07
ΔUR	-3.00	1.10	-.80	.79
ΔALR	-14.30	4.30	-1.08	3.22
RGDPG	1.40	6.80	3.71	1.51
ΔPTY	-7075.20	4409.30	-1445.74	3298.95

Corr. matrix for variables used in the model with BR as DV (N =40)

	ΔMCPK	ΔUR	ΔCPIS	ΔPTY	ΔALR
ΔUR	-.130				
ΔCPIS	.031	.202			
ΔPTY	.024	.446***	.181		
ΔALR	-.045	-.168	-.084	-.264*	
BR	.039	.007	.093	.132	-.183

•*Significant at 0.1 level, ** Significant at 0.5 level, ***Significant at 0.01 level

Corr. matrix for variables used in the model with DR as DV (N =28)

	ΔTSSC	ΔCPIS	ΔUR	ΔALR	RGDPG	ΔPTY
ΔCPIS	.085					
ΔUR	-.082	.110				
ΔALR	-.093	-.232	-.024			
RGDPG	.057	.345	-.468**	-.338*		
ΔPTY	.805***	.126	-.050	-.238	.180	
DR	-.037	-.154	.409**	.119	-.430**	-.043

TSCS analysis (DV:BR)

Intercept	**0.098 (29.3) *****	**0.099658 (40.9) *****	**0.102772 (131.7) *****	**0.1074 (17.6)*****	**0.1030 (16.52)*****
Δ ALR	**-0.00125 (3.37)*****	**-0.0014 (3.93)*****	**-0.0017 (-8.2) *****	-0.0014 (1.1)	**-0.0029 (-1.93)***
Δ CPIS		**0.007709 (3.50)*****	**0.0053 (8.6)*****	**0.0041 (1.98)***	**0.0057 (3.53)*****
Δ UR					-0.0061 (-1.62)
ΔPTY			**$-3.04x10^{-7}$ (-5.1)*****	**$-1.32x10^{-7}$(0.27)*****	
Δ MCPC				**0.0002 (3.72)*****	0.00062 (0.51)
R^2	0.4177	0.6563	0.9216	0.6499	0.6191
Years	**4 (1999-2002)**	**4 (1999-2002)**	**4 (1999-2002)**	**4 (1999-2002)**	**4 (1999-2002)**

TSCS analysis (DV: DR)

Intercept	**0.0877 (152.7)*** **	**0.0852 (121.6)*** **	**0.0010 (90.6)*** **	**0.0873 (28.6)*** **	**0.0930 (14.2)*** **	**0.089 (10.94) *** **	**0.0969 (10.0)*** **
Δ ALR	**0.004 (2.1)****	**0.0007 (1.9)***	**0.0017 (2.5)****	**0.0013 (2.41)****	0.0029 (1.3)	0.0014 (0.67)	0.0039 (1.5)
Δ TSSC						**$6.94x10^{-6}$ (2.63)****	-0.0000 (-0.4)
Δ CPIS		**0.0023 (2.0)***	**0.0068 (2.4)****	**0.0047 (1.8)***	**0.0127 (1.9)***	0.009 (1.57)	**0.0167 (2.4)****
Δ UR				0.0031 (0.6)	0.0026 (0.5)	0.003 (0.66)	0.0020 (0.4)
RGDPG					-0.0015 (-0.9)	0.0003 (0.14)	-0.0026 (-0.8)
Δ PTY			**$5.595x10^{-7}$ (4.1)*****	**$5.441x10^{-7}$ (4.9)*****	**$6.890x10^{-7}$ (3.2)*****		$1.097x10^{-6}$ (1.5)
R^2	0.22	0.24	0.68	0.90	0.63	0.53	0.62
Years	4 (1998-2001)	4 (1998-2001)	4 (1998-2001)	4 (1998-2001)	4 (1998-2001)	4 (1998-2001)	4 (1998-2001)

Conclusion and Implications

- Only a small proportion of latent entrepreneurs can start their own businesses.
  - A lack of access to capital is often the biggest roadblock (Blanchflower et al., 2001).
- Cross-country empirical supportive empirical evidence
- BR/DR--linked to availability and cost of capital and perceptions of corruption.
  - policy makers-- consider the ways in which these conditions might be revised, strengthened, or enhanced to better tap into entrepreneurial energy and creativity.